



**COST PLUS FIXED FEE-AWARD FEE, AWARD TERM
RESEARCH & DEVELOPMENT CONTRACT**

Contract No. 1254038

BETWEEN

**CALIFORNIA INSTITUTE OF TECHNOLOGY
JET PROPULSION LABORATORY
(The "Institute" or "JPL")
4800 OAK GROVE DRIVE
PASADENA, CALIFORNIA 91109-8099**

AND

**ITT Industries
Systems Division
4410 E. Fountain Boulevard
P.O. Box 15012
Colorado Springs, CO 80935-5012**

**THIS CONTRACT FOR
Deep Space Network (DSN) Operations & Maintenance**

**IS A
SUBCONTRACT UNDER JPL's NASA PRIME CONTRACT**

TASK ORDER NO. 10820 / NMO7-10820

A DO - C9 Rating is assigned to this Contract under DMS Regulation 1

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The following documents are incorporated into and made a material part of this contract.

GENERAL PROVISIONS: Cost-Reimbursement with Commercial Organizations Contract R 8/01, with Incorporated Exhibits.

- Management of Government Property in the Possession of Contractors, Form JPL 0968
- Release of Information, Form JPL 1737
- Affiliate Access Report, Form JPL 1943
- Notification to Prospective Contractors of JPL's Ethics Policies and Anti-Kickback Hotline, Form JPL 2385
- Certifications, Form JPL 2892
- Asbestos Notification, Form JPL 2895

ADDITIONAL GENERAL PROVISIONS (AGPs)

Cost Accounting Standards and Administration of Cost Accounting Standards R 4/99

Patent and Copyright Agreement R 4/99

Audit-Negotiation – Access to Computers R 4/99

Continuity of Services R 4/99

Drug and Alcohol Free Workforce R 4/99

Duty-Free Entry R 3/00

Facilities Equipment Modernization R 4/99

Filing of Patent Applications - Classified Subject Matter R 4/99

Foreign Travel Reporting Requirements R 4/99

Inspection of Services R 4/99

Prime Contract Expiration – Cost/CREI 7/02

Safety And Health R 4/00

Security Requirements R 4/99

Security Requirements for Unclassified Automated Information Resources and Access to JPL's
Controlled Facilities R 12/01

Service Contract Act Of 1965, as amended - Long Form R 4/99

Waiver of Facilities Capital Cost of Money R 4/99

PREAMBLE

This Contract, entered into on October 1, 2003 by and between the CALIFORNIA INSTITUTE OF TECHNOLOGY (hereinafter called the "Institute" or "JPL"), a corporation organized and existing under the laws of the State of California, and ITT Industries, Systems Division (hereinafter called the "Contractor"), a corporation organized and existing under the laws of the State of Indiana and constituting a subcontract under Prime Contract NAS7-03001 between the Institute and the Government;

WITNESSETH THAT:

The Contractor agrees to furnish and deliver the supplies and performs the services set forth in this Contract for the consideration stated herein.

SCHEDULE

ARTICLE 1. STATEMENT OF WORK AND DELIVERY INSTRUCTIONS

The Deep Space Network (DSN) (referred to as 'the Network') is comprised of operational and test facilities, the personnel who implement, operate, and maintain the facilities, and the policies, processes, and procedures that enable the implementation, operation, and maintenance of the facilities. The Network includes the following key facilities:

- Goldstone Deep Space Communications Complex (GDSCC) [Barstow - Ft. Irwin, CA]
- Madrid Deep Space Communications Complex (MDSCC) [Spain]
- Canberra Deep Space Communications Complex (CDSCC) [Australia]
- Deep Space Operations Control Center (DSOCC) [at JPL, Pasadena, CA]
- Development and Test Facility (DTF-21) [Pasadena, CA]
- Merritt Island Launch facility (MIL-71) [Kennedy Space Center, FL]
- Compatibility Test Trailer (CTT-22) [transportable station]
- Remote Operations Support Area

The Contractor is expected to actually begin the work of operating and maintaining the facilities specified on January 1, 2004. Although the Contract will be signed before that date, the only costs incurred prior to January 1, 2004 should be those incidental to staffing and preparing for the transfer of responsibility on January 1, 2004.

On or Before

1.0 The Contractor shall:

Provide operations and maintenance of the GDSCC and DSOCC, prepare the Network for mission support, analyze Network performance, provide logistical and technical services that support the Network, and perform product engineering for designated subsystems. All central management functions necessary to support the above shall also be provided, including financial management and reporting, procurement services; safety, health and environmental planning; IT security and physical security planning, facilities management, property management, administrative support, workmanship assurance and program integration. The Contractor shall perform these services in accordance with, but not necessarily limited to, the detailed requirements set forth in the 'Task Description Document for

As Required

Maintenance and Operation of the Deep Space Network' dated March 21, 2003 (Exhibit 2), which is incorporated by reference and made a part of this Contract.

A. Specifically, the Contractor shall, in accordance with the Technical Description Document (TDD):

- 1) Operate and maintain the GDSCC, including
 - (a) Real-time 24x7 mission support operations
 - (b) Maintenance of the GDSCC facilities and infrastructure
 - (c) Maintenance of the GDSCC operational equipment
 - (d) Operation and maintenance of 'advanced systems' at GDSCC
 - (e) Provide technical services needed to support operations and maintenance
 - (f) Conduct Radio Frequency Interference (RFI) event analysis/investigation and participate in air corridor coordination activities
 - (g) Maintenance of the DSN portion of the Emergency Control Center (ECC), and initialization of the ECC in response to emergency conditions
 - (h) Management of the Complex, including functions of site security, safety, health and environmental compliance, energy acquisition/management/conservation, administrative communications, support services, workmanship assurance, and outreach activities.
- 2) Operate and maintain the Deep Space Operations Control Center. The DSOCC includes the Network Operations Control Center (NOCC), the Central Communications Terminal (CCT), Radio Metric Data Conditioning (RMDC), Data System Operations, the Very Long Baseline Interferometry (VLBI) Correlator Facility, the Remote Operations Support Area (ROSA), and Data System Processing Area (DSPA).
- 3) Operate and maintain the DSN test facilities, including the Development and Test Facility (DTF-21), the Compatibility Test Trailer (CTT-22), and the DSN equipment in the control room at the Merritt Island Launch Support Facility (MIL-71).
- 4) Support the Network resource allocation process, and schedule use of the Network.
- 5) Generate mission-specific support products and procedures
- 6) Generate mission-independent Network Standard Operating Procedures (SOPs)

- 7) Analyze and report on Network performance
 - 8) Provide support services that are utilized across the Network, including change management, performance metrics, documentation, and depot maintenance
 - 9) Provide logistical support for shipment of equipment and documentation to and from the DSCCs and to and from MIL-71.
 - 10) Provide the Network operations engineering function for antenna-mechanical systems, RF-microwave systems, data systems, and systems integration
 - 11) Develop and sustain a designated set of Network subsystem elements.
- B. In performance of this effort, the Contractor shall provide the Reports, Plans and Records in accordance with the CDRL (Exhibit 1).
- C. The Contractor shall provide for the following general capabilities:
- 1) It is the Contractor's responsibility to procure and stock all miscellaneous items necessary to maintain and support the GDSCC facilities and support services. The supplies shall include such items as standard electronic and mechanical components, standard tools and test equipment, building maintenance materials, office supplies, and supplies for janitorial services. These supplies do not include components or elements of DSN operational subsystems.
 - 2) In support of the civil infrastructure at GDSCC, the Contractor must provide the capability for the preparation of construction drawings and specifications; the engineering supervision and inspection of work in progress; the procurement of construction bids; and the compliance with all applicable federal construction-of-facilities (CoF) regulations.
- D. Technical Support, Level-of-Effort Special Studies and Support
- Provide on a level-of-effort basis up to one hundred and fifty thousand (150,000) equivalent work-hours of engineering direct labor to support various deep-space network development tasks and studies as directed in writing by the cognizant JPL Negotiator. Article 6 provides administrative requirements.

E. Exhibits

The following Exhibits, which are contract requirements, are incorporated into and made a part of this Contract.

- | | |
|-----------|---|
| EXHIBIT 1 | DEEP SPACE NETWORK, OPERATIONS AND
MAINTENANCE, CONTRACT DATA
REQUIREMENTS LIST (CDRL), DATED MARCH 6,
2003. |
| EXHIBIT 2 | MAINTENANCE AND OPERATIONS OF THE DEEP
SPACE NETWORK, TASK DESCRIPTION
DOCUMENT, DATED MARCH 21, 2003 |
| EXHIBIT 3 | TRANSITION PERIOD STANDARD OF EXCELLENCE
METRICS FOR PERFORMANCE MEASUREMENT. |
| EXHIBIT 4 | STANDARD OF EXCELLENCE METRICS FOR
PERFORMANCE MEASUREMENT. |

2.0 JPL will:

- A. Provide the Contractor with written technical and cost guidelines for preparation of the Annual Operating Plan per DRD M018. Normally, these will be provided in March of every year.
- B. Reserve the right to procure materials and services required for operation of the Network.
- C. Provide office space, equipment, and communications services for work to be performed at JPL in Pasadena. Office space and equipment for GDSCC tasks are available at that facility.
- D. Review draft documents and provide written comments or approval in a timely manner.
- E. Provide all Government-owned facilities and property including, but not necessarily limited to, that located at DSOCC, GDSCC, DTF-21, and CTT-22.
- F. Maintain the Government property records of property provided in paragraph 2.0.E above.
- G. Provide JPL affiliate badges and access to the Laboratory for authorized Contractor personnel.
- H. Comply with Contractor's Safety and Health rules when JPL personnel are at the Contractor's facilities.
- I. Comply with Contractor's environmental rules when JPL personnel are at the Contractor's facilities.

3.0 Delivery Instructions

- 3.1 Except as otherwise provided in this Contract, the point of inspection, acceptance and delivery of all supplies deliverable under this Contract shall be the Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, California 91109. All such supplies shall be packaged, packed, boxed, or crated in such a manner to ensure safe delivery and shall be shipped prepaid and at the Contractor's expense to the point of delivery.
- 3.2 The Contractor shall provide the Contracting Officer (CO) the annual and final reports of subject inventions described in the Article entitled "Patent Rights - Retention by the Contractor (Short Form)." Copies of transmittal letters shall be sent to the JPL Intellectual Property Office (IPO) and to the cognizant JPL negotiator.

4.0 Contract Term

- 4.1 This is an award term contract as specified in Article 5.

ARTICLE 2. ALLOWABLE COSTS, FIXED FEE, AWARD FEE, AND PAYMENT.

1.0 Estimated Cost, Fixed Fee, and Maximum Award Fee.

1.1 Estimated Cost: [REDACTED]

1.2 Fixed Fee: [REDACTED]

1.3 Maximum Award Fee: [REDACTED]

FOIA EXEMPTION
(b)(4)

Subject to any equitable adjustment which is otherwise provided for under the provisions of this Contract, the available award fee and fixed fee will be the maximum stated above and the amount of such fee to be actually awarded will be in accordance with the provisions of paragraph 2.0 of this Article. There shall be no adjustment in the amount of available award fee and fixed fee or any claim for increased award fee and fixed fee because of errors or omissions made in computing the estimated cost or the fact that the actual cost varies from the estimated cost.

The total amount allotted to this Contract is \$1,000,000

2.0 Award Fee.

2.1 The Contractor's performance will be evaluated by JPL in the following categories:

2.1.1 **Technical Performance:** Technical performance will be evaluated in the areas of maintenance and operations of the DSN and Product Engineering.

2.1.2 **Schedule Performance:** Schedule performance will be evaluated by considering the extent of adherence to established schedules, effectiveness of work around plans, and accommodation of changes with minimum impact on schedule performance.

2.1.3 **Administrative Performance:** Administrative performance will be evaluated in the areas of management, communications and coordination, contractual documentation and reports, and subcontracting goals.

2.1.4 **Cost-Effectiveness:** Cost-effectiveness and performance will be evaluated by considering the degree to which costs are controlled and optimized.

2.2 The Contractor's performance will be evaluated twelve (12) months after the date of the contract or in coordination with award term evaluations. Interim evaluations will be done every six (6) months for informal feedback. The Award Fee available for each period shall be the Maximum Award Fee still available for award divided by the number of periods remaining to be evaluated.

The Award Fee Areas of Emphasis adjective ratings are: *excellent*, *very good*, *adequate*, and *poor*. The Standard of Excellence Metrics ratings are: *exceeds expectations*, *meets expectations*, and *below expectations* (see Exhibits 3 and 4).

2.2.1 The Contractor Standard of Excellence Metrics rating will be "*exceeds expectations*" if greater than 60 percent of the individual Standard of Excellence Metrics exceed expectations and no Standard of Excellence Metrics are below expectations.

- 2.2.2 The Contractor Standard of Excellence Metrics rating will be “*meets expectations*” if no more than 20 percent of the individual Standard of Excellence Metrics are below expectations.
- 2.2.3 The Contractor Standard of Excellence Metrics rating will be “*below expectations*” if more than 20 percent of the individual Standard of Excellence Metrics are below expectations.
- 2.3 Prior to the beginning of each award period, and during the period, JPL will provide the Contractor with the areas of emphasis within the performance categories which shall form the basis for determining the amount of fee to be awarded to the Contractor for the award period involved.
 - 2.3.1 The total maximum Award Fees allotted to all periods will equal the maximum amount of the Award Fee specified in paragraph 1.3, above. An Award Fee considered in any given period will not be considered again in subsequent periods.
- 2.4 At the end of each award period the Contractor’s performance with respect to the established criteria will be evaluated by JPL and a unilateral determination made as to the amount of Award Fee earned and payable for the period evaluated. In order for any award fee to be earned the contractor must meet or exceed the Standard of Excellence Metric and have *adequate* or higher rating on the Award Fee Area of Emphasis (see Exhibits 3 and 4). This amount may be none, part of or all of the maximum amount of Award Fee allocated to that period.
- 2.5 The Contractor will be advised promptly in writing of JPL’s award decisions. Additionally, the rationale of the decision will be explained to the Contractor by JPL.
- 3.0 Precontract Costs. There shall be no allowance for costs incurred prior to the date of this Contract. If this Definitive Contract has been preceded by a Letter Contract, the phrase "date of this Contract" as used in this paragraph 2.0 shall mean the effective date of the Letter Contract
- 4.0 Invoices. Invoices shall be submitted, in triplicate, to Supplier Payments Section MS 601-208, 4800 Oak Grove Drive, Pasadena, California 91109-8099.
- 5.0 Payment of Fixed Fee. The fixed fee payable under this Contract shall be paid to the Contractor in monthly installments based upon the percentage of work completed as estimated by the Contractor and approved by JPL; subject, however, to the provisions of the “Allowable Cost and Payment” Article of this Contract.
- 6.0 Payment of Award Fee. Any Award Fee awarded for any period shall be payable to the Contractor in full in one (1) lump sum, upon issuance of a modification to the contract incorporating the award amount and submission of a proper invoice.
- 7.0 Allowable Costs. For the purpose of determining the amounts payable to the Contractor under this Contract, the allowability of costs shall be determined in accordance with the General Provision (GP) of this Contract entitled "Allowable Cost and Payment;" provided, however, that in determining the allowability of costs, the advance understandings, if any, on particular items of cost set forth below shall be given effect. In the event of any inconsistency between such advance understandings and the cost principles referred to in the "Allowable Cost and Payment" GP referenced above, the cost principles shall prevail.
 - 7.1 Direct Costs. No advance understandings.

ARTICLE 3. SPECIAL PROVISIONS

Conduct and Separation Special Provision Text
Data Removal From Computers Special Provision Text
Government Property Transfer Special Provision Text
JPL Contractor Safety and Health Notification Special Provision Text
Key Personnel and Facilities Special Provision Text
Personnel Processing Special Provision Text
Reimbursable Hours Special Provision Text
Report of Hours Worked by Contractor Personnel Special Provision Text
Security or Privacy Safeguards Special Provision Text
Software Furnished by JPL Special Provision Text
Subcontract Real Property Leases Special Provision Text
Use of Government Facilities or Equipment Special Provision Text

ADDITIONAL SPECIAL PROVISION:

DATA OWNERSHIP

JPL retains ownership of all data obtained by the Contractor through this Contract, including data on Contractor owned machines being provided to JPL as a service under this Contract.

ARTICLE 4. ALTERATIONS TO THIS CONTRACT

The following alterations have been made to this Contract:

"Allowable Cost and Payment" GP Alteration Text (Cost of money Alteration)
Audit and Examination of Records – Negotiation Alteration Text
Fee Withhold - CPAF Contract Alteration Text (Text included below)
Inspection of Research and Development (Short Form) Alteration Text
Security Requirements Alteration Text
Termination - CPAF Contract Alteration Text (Text included below)

1.0 Fee Withhold

Subparagraph (d)(2) of the Article entitled "Allowable Cost and Payment" is hereby deleted and the following is substituted:

- (2) Payment of fee, if any, shall be made to the Contractor as specified in this Contract; provided, however, that payment of any fee awarded upon completion of the Contract, or in the absence thereof any fee awarded for the final period of the Contract, not to exceed \$100,000 shall be withheld subject to the provisions of paragraph (i) below.

2.0 Termination

Subparagraph (h)(4) of the Article entitled "Termination - Cost" is hereby deleted and the following is substituted:

- (4) A portion of the fee payable under this Contract, determined as follows:

- (A) In the event of termination of this Contract for the convenience of the Institute or the Government and not for the default of the Contractor, there shall be paid an award fee determined in accordance with the provisions of the Schedule for such periods of time prior to the termination as to which no award has been previously made.
- (B) In the event of the termination of this Contract for the default of the Contractor, the total fee payable shall be such award or awards, if any, as were made prior to the termination.

3.0 Limitation of Funds

Paragraph (k) of the Article entitled "Limitation of Funds" is hereby deleted and the following is substituted:

- (k) In the event that sufficient amounts are not allotted to this Contract to allow completion of the work, the Contractor is entitled, subject to the limitations of paragraph (e) of this General Provision, to fees computed in accordance with the provisions of paragraph (h)(4)(A) of the Article of this Contract entitled "Termination - Cost."

4.0 "Allowable Cost and Payment" GP

Paragraph (a)(2) of the Article of this Contract entitled "Allowable Cost and Payment" is deleted, and the following paragraph is substituted:

The Institute shall make payments to the Contractor once each month (or at more frequent intervals if approved by JPL), in amounts determined to be allowable by the Institute in accordance with Subpart 31.2 of FAR and any corresponding implementing or supplementing provisions in the NFS and the terms of this Contract. The Contractor may submit, in such form and reasonable detail as JPL may require, an invoice supported by a statement of the claimed allowable cost for performing this Contract. Notwithstanding Federal Acquisition Regulation 31.205-10, facilities capital cost of money is not an allowable item of cost under this Contract.

5.0 Audit and Examination of Records – Negotiation

In the Article entitled “Audit and Examination of Records - Negotiation,” delete paragraphs (b), (c), (d)(1), and (e) and substitute:

(b) Examination of Costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable Contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer who is an employee of the Government, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this Contract. This right of examination shall include inspection at all reasonable times of the Contractor's plants, or parts of them, engaged in performing the Contract.

(c) Cost or Pricing Data. If the Contractor has been required to submit cost or pricing data in connection with pricing action relating to this Contract, the Contracting Officer, or an authorized representative of the Contracting Officer who are employees of the Government, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to:

- (1) The proposal for the Contract, subcontract, or modification;
- (2) The discussions conducted on the proposal(s), including those related to negotiating;
- (3) Pricing of the Contract, subcontract, or modification; or
- (4) Performance of the Contract, subcontract, or modification.

(d) Comptroller General.

(1) The Comptroller General of the United States, or an authorized representative who is an employee of the Government, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this Contract or a subcontract hereunder.

(e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer, or an authorized representative of the Contracting Officer who is an employee of the Government, shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating (i) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports and (ii) the data reported.

6.0 Fee Withhold – CPAF Contract

The following alteration has been made in the provisions of this Contract:

Subparagraph (d)(2) of the Article entitled "Allowable Cost and Payment" is hereby deleted and the following is substituted:

- (2) Payment of the fee, if any, shall be made to the Contractor as specified in this Contract; provided, however, that payment of any fee awarded upon completion of the Contract, or in the absence thereof any fee awarded for the final period of the Contract, shall be withheld subject to the provisions of paragraph (i) below.

7.0 Inspection of Research and Development – Short Form

The GP Article entitled "Inspection of Research and Development" is hereby deleted in its entirety and the following is substituted:

ARTICLE GP- . INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM)

JPL and the Government have the right to inspect and evaluate the work performed or being performed under the Contract, and the premises where the work is being performed, at all reasonable times and in a manner that will not unduly delay the work. If JPL or the Government performs inspection or evaluation on the premises of the Contractor or a subcontractor, the Contractor shall furnish and shall require subcontractors to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

- 4. Remarks: Nonprofit Organizations, other than educational institutions (which use the CREI GPs), utilize the standard CT GPs, with alterations when appropriate.

8.0 Security Requirements

Add the following paragraph (f) to the Additional General Provision entitled "Security Requirements:"

- (f) The Contractor, or any of its personnel, shall not have access to any classified information and shall not perform any classified work under this Contract until notified by the cognizant JPL Negotiator that all security clearance processing has been completed.
- 4. Reference: Form DD 254, "Contract Security Classification Specification."

9.0 Termination – CPAF Contract

Subparagraph (h)(4) of the Article entitled "Termination - Cost" is hereby deleted and the following is substituted:

- (4) A portion of the fee payable under this Contract, determined as follows:
 - (A) In the event of termination of this Contract for the convenience of the Institute or the Government and not for the default of the Contractor, there shall be paid an award fee determined in accordance with the provisions of the Schedule for such periods of time prior to the termination as to which no award has been previously made.
 - (B) In the event of the termination of this Contract for the default of the Contractor, the total fee payable shall be such award or awards, if any, as were made prior to the termination.

b. Supplemental text:

Paragraph (k) of the Article entitled "Limitation of Funds" is hereby deleted and the following is substituted:

- (k) In the event that sufficient amounts are not allotted to this Contract to allow completion of the work, the Contractor is entitled, subject to the limitations of paragraph (e) of this General Provision, to fees computed in accordance with the provisions of paragraph (h)(4)(A) of the Article of this Contract entitled "Termination - Cost."

ARTICLE 5. AWARD TERM EXTENSIONS AND REDUCTIONS

1.0 Issuance of Award Term Extension or Reduction

- 1.1 The initial five (5) year contract term may be extended or reduced by JPL via unilateral modification on the basis of contractor performance, resulting in a contract term lasting a maximum of ten (10) years or a minimum of three (3) years from the date of contract award. The decision to award the term extensions will be based on a continuing need for the service, the availability of funding and the Contractor's performance.
 - 1.1.1 Maximum contract term: There are a maximum of ten 6-month term extensions available. If the Contractor earns all available term extensions, the maximum term of this contract shall be 10 years.
 - 1.1.2 Minimum contract term: If the Contractor's performance in each of the first two years results in 6-month term reductions, then the contract term may be shortened to 3 years.
 - 1.1.3 As needed, to avoid premature expiration of the contract, JPL reserves the right to award one, two, or three 6-month term extensions at a time.
 - 1.1.4 If a contract term reduction would result in inadequate lead time to recompile this contract, the term reduction may not be implemented and the Contractor will be notified of this decision.

2.0 Monitoring of Performance

- 2.1 The Contractor will be evaluated by JPL toward the end of every year during the initial five (5) year base period and every year thereafter, during any award term extension. The award term evaluation will be based on the Contractor's performance during each year's evaluation period. The Contractor will be evaluated against the performance metrics provided to JPL in accordance with the Performance Metrics Plan specified in Exhibits 3 and 4.
- 2.2 Reserved
- 2.3 The Contractor is subject to the following award term determination based on Award Fee adjective ratings and Standard of Excellence Metrics.

The Award Fee Areas of Emphasis adjective ratings are: *excellent*, *very good*, *adequate*, and *poor*. The Standard of Excellence Metrics ratings are: *exceeds expectations*, *meets expectations*, and *below expectations* (see Exhibits 3 and 4).

- 2.3.1 The contractor will be awarded additional contract term, under the following condition:
 - 2.3.1.1 If the Standard of Excellence Metrics *exceed expectations* and the Award Fee adjective rating is *very good* or *excellent*, a six (6) month award term extension is awarded.
- 2.3.2 The contract term will be reduced under either of the following two conditions:

2.3.2.1 If the Standard of Excellence Metrics *meets expectations*, but the Award Fee adjective rating is *poor*, the contract term is reduced by six (6) months

2.3.2.2 If the Standard of Excellence Metrics are *below expectations*, the contract term is reduced by six (6) months.

2.3.3 The contract term will not be modified under other performance ratings.

2.3.4 If the Contractor's performance during any two consecutive award fee evaluation periods is *poor*, then JPL will initiate a new acquisition.

3.0 Award Term Pricing

3.1 The following estimated cost, fixed fee, and maximum award fee shall apply to each period below.

	Period	Estimated Cost	Maximum Fixed Fee	Award Fee	Remarks
3.1.1	10/1/03 – 9/30/06	[REDACTED]	[REDACTED]	[REDACTED]	Minimum term of contract
3.1.2	10/1/06 – 3/31/07	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.3	4/1/07 – 9/30/07	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.4	10/1/07 – 3/31/08	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.5	4/1/08 – 9/30/08	[REDACTED]	[REDACTED]	[REDACTED]	End of 5 year basic contract
3.1.6	10/1/08 – 3/31/09	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.7	4/1/09 – 9/30/09	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.8	10/1/09 – 3/31/10	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.9	4/1/10 – 9/30/10	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.10	10/1/10 – 3/31/11	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.11	4/1/11 – 9/30/11	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.12	10/1/11 – 3/31/12	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.13	4/1/12 – 9/30/12	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.14	10/1/12 – 3/31/13	[REDACTED]	[REDACTED]	[REDACTED]	
3.1.15	4/1/13 – 9/30/13	[REDACTED]	[REDACTED]	[REDACTED]	Maximum term of contract

FOIA EXEMPTION
(b)(4)

4.0 Price Adjustment

4.1 Service Contract Act Adjustment

Upon the exercise of an extension, JPL reserves the right to adjust the wage rates and fringe benefits required to be paid the affected Contractor personnel per the Wage Determination attached to this Contract pursuant to the requirements of the Additional General Provision of this Contract entitled "Service Contract Act of 1965, as Amended (Long Form)." That adjustment and a corresponding adjustment to the estimated cost of the Contract shall be negotiated upon the issuance by the Department of Labor of a new Wage Determination to cover the extension period. These negotiations shall also take into consideration any changes in wages resulting from renewed Collective Bargaining Agreements negotiated between this

Contractor and the Bargaining Units. Any adjustment shall not include any adjustment to the fixed fee or maximum Award Fee of the contract.

4.2 Award Term Price Revision

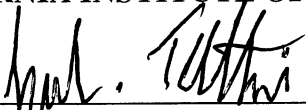
JPL recognized that being contractually bound by cost estimates agreed to years in advance has significant risk for both parties. Therefore, no later than thirty (30) days following JPL's award of a term extension, the Contractor may submit a cost revision proposal (in addition to the adjustment allowed under paragraph 4.1, above) with all necessary back up documentation justifying the revision. The proposal may be subject to verification and negotiation. Any agreed to cost revision will be implemented via Supplemental Agreement separate from the unilateral modification implementing the term extension. Any adjustment shall not include any adjustment to the fixed fee or maximum Award Fee of the contract.

ARTICLE 6. TECHNICAL SUPPORT, LEVEL-OF-EFFORT REQUIREMENTS

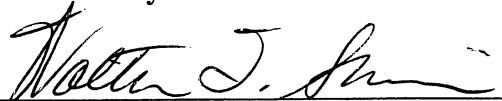
- 6.1 The level-of-effort tasks shall be considered to have been completed when the equivalent work-hours specified in Article 1, paragraph 1.0.D have been expended.
- 6.2 If the Contractor is not required by JPL to provide, or if the Contractor does not provide, the specified level-of-effort equivalent work-hours set forth in Article 1, paragraph 1.0.D, the Institute shall be entitled, in addition to any other rights which the Institute may have under this Contract, to an equitable adjustment downward in the estimated cost, fixed fee, and award fee of the Contract.
- 6.3 For purposes of making an equitable adjustment as provided by paragraph 6.2 above, each equivalent work-hour expended in support of the level-of-effort requirements specified in Article 1, paragraph 1.0.D, shall be calculated by JPL using the average rate for the actual level of effort work performed at the cost level and at the negotiated rate of the fixed fee and award fee. The parties agree that an equivalent work-hour will have been expended either when one (1) direct labor hour has been expended *or* when other direct costs generated in the performance of a level-of-effort requirement have been incurred in an amount equal to the above-stated rate or major fraction thereof.
- 6.4 Except where the Contractor is specifically required by modification to this Contract to perform additional level-of-effort equivalent work-hours in excess of the specified level-of-effort equivalent work-hours set forth in Article 1, paragraph 1.0.D, provision by the Contractor of level-of-effort work-hours in excess of said specified level-of-effort equivalent work-hours, shall not be the basis for an adjustment in the amount of available fixed fee.
- 6.5 If, during the performance period of this Contract, JPL requires an increase or decrease in the number of equivalent work-hours set forth in Article 1, paragraph 1.0.D, the Contractor agrees to enter promptly into negotiations. Any Contract modification resulting from such negotiations will provide for adjustments of the estimated cost and fixed fee set forth in paragraph 6.1 above based upon the increased or decreased numbers of equivalent work-hours.

IN WITNESS WHEREOF, the parties hereto have executed this Contract as of the day and year first above written.

CALIFORNIA INSTITUTE OF TECHNOLOGY

By 
Lt. Gen. (Retired) Eugene L. Tattini, USAF
Deputy Director

ITT Industries Systems Division

By 
(Signature)

Walter I. Skinner
(Typed Name)

Vice President, Director of Acquisition Mgmt.
(Title)

Instructions to Contractor: Do not insert date on Preamble page.

ARTICLE 3 Special Provisions

1.0 Conduct and Separation.

All Contractor personnel working in-residence at a JPL facility will be expected to conduct themselves in accordance with JPL standards of conduct, as described in "Standards of Conduct and Procedures for Handling Contractor Personnel Problems, Discipline, and Separation," form JPL 4412, which is incorporated into this Contract. The Contractor shall be responsible for ensuring that its personnel perform their JPL work assignments and conduct themselves in a manner acceptable to JPL. JPL may require the Contractor to separate any Contractor personnel from a JPL work assignment at any time for any lawful reason. In the event of such separation, the Contractor shall have the responsibility for reassigning or terminating such Contractor personnel.

2.0 Data Removal from Computers.

The Contractor shall erase or otherwise remove all data (which can include sensitive, Privacy Act, proprietary, and mission critical data) from hard drives and other computer storage devices and remove licensed software from Government-owned computers before such computers leave the control of the Contractor organization by transfer or disposal. JPL data shall also be removed from Contractor-owned computers when the computer will be no longer used for this Contract. The Contractor shall archive all data required to be retained, pursuant to the "Rights in Data - General" Article. Guidance on what constitutes mission-critical data and sensitive information (such as business and restricted technology information and scientific, engineering, and research information) is contained in NASA Procedure and Guidelines for Security of Information Technology (NPG) 2810, available on the worldwide web or from the JPL Negotiator. Proprietary data consists of trade secrets and other commercial or financial information confidential to the individual owner or organization. Proprietary data is normally labeled as such. Trade secrets or commercial or financial information that has been released to the public or is otherwise in the possession of persons other than the individual owner or organization is in the public domain and may no longer be entitled to proprietary protection.

The Contractor shall submit to JPL a written certification that all applicable data has been erased or otherwise removed from computers when returned to JPL or disposed of.

3.0 Government Property Transfer.

Accountability for all Government-owned property acquired under Contract No. (*) is hereby transferred to Contract No. (*), effective the date of this Modification No. (*). The transferred property specified below is for use in the performance of this Contract and is subject to the provisions of the Article of this Contract entitled "Government Property" and the attachment to the "Government Property" Article, "Management of Government Property in the Possession of Contractors" (form JPL 0968).

(* enter number)

Govt. ID No.	Nomenclature	Model	Serial No.	Qty.	Value
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4.0 JPL Contractor Safety and Health Notification.

Contractor has signed and acknowledged receipt of a copy of "JPL Contractor Safety and Health Notification," form JPL 2885 (identifying applicable required documentation, safety requirements, emergency handling procedures, etc.), which is hereby made a material part of this Contract. The costs associated with compliance with all applicable requirements as identified on form JPL 2885 are included in the Contract pricing, and therefore, Contractor compliance with such requirements shall not entitle the

Contractor to an equitable adjustment under the General Provisions of the Contract entitled "Safety and Health," and "Changes," or under any other provision of this Contract.

5.0 Key Personnel and Facilities.

The personnel and/or facilities, if any, specified below in paragraph (*) are considered essential to the work being performed hereunder. Prior to removing, replacing, or diverting any of the specified individuals or facilities, the Contractor shall notify JPL reasonably in advance and shall submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on this Contract. No diversion shall be made by the Contractor without the written consent of JPL; provided, that JPL may ratify in writing the change, and such ratification shall constitute the consent of JPL required by this Article. Paragraph (b) below may, with the consent of the Contracting parties, be amended from time to time during the course of the Contract to either add or delete personnel and/or facilities, as appropriate.

The following Contractor personnel shall be considered Key Personnel under this Contract:

(**)

(* enter paragraph number; ** enter list names; you may also indicate the fraction of full time agreed to, or hours proposed - e.g., "Bruce Wayne - Full Time" or "Clark Kent - 20 Hours")

6.0 Personnel Processing.

Contractor personnel shall report to the JPL Security Group Office for (i) check-in processing before commencing work and (ii) check-out processing when terminating. Separation check-out will include the return of all Government property and badges, documents, and tools which may have been provided by JPL during each individual's performance under this Contract.

7.0 Reimbursable Hours.

Contractors are reimbursed only for the specific hours worked by their personnel, which have been authorized by JPL in accordance with corresponding contract terms. Contractors are not reimbursed for any scheduled time not worked due to their personnel being directed by JPL to leave, or not report to, their JPL workstations when JPL deems it to be unsafe or useless to work at their JPL workstations due to earthquake, fire, civil disturbance, hazardous materials (HAZMAT) incident, power outage, or other situations.

8.0 Report of Hours Worked by Contractor Personnel.

The Contractor is required to furnish JPL with a report of the hours worked by its employees. This report shall be weekly, in accordance with the terms of the Contract. The report is used by JPL for work-hour reporting only. The report should include the following information:

Contract company name.

Contract number.

Week ending date. Week should be compiled on the same basis as the Laboratory workweek, i.e., the workweek starting at 12:01 AM Monday and ending at midnight on the following Sunday.

The name and JPL badge numbers of all contractor personnel. No contractor personnel should work more than one week on a visitor's badge.

Columns for straight-time hours and overtime hours distributed by JPL account numbers in a format acceptable to the JPL Contract Audit Group of the Accounting Section.

The work location of contractor personnel (building/room number, or name of other location).

Signature approvals by representatives of the Contractor company and the cognizant Contract technical manager.

9.0 Security or Privacy Safeguards.

The Contractor shall not publish or disclose in any manner, without the Negotiator's written consent, the details of any safeguards either designed or developed by the Contractor under this Contract or otherwise provided by JPL.

To the extent required to carry out a program of inspection to safeguard against threats and hazards to the security, integrity, and confidentiality of JPL data, the Contractor shall afford JPL access to the Contractor's facilities, installations, technical capabilities, operations, documentation, records, and databases.

If new or unanticipated threats or hazards are discovered by either JPL or the Contractor, or if existing safeguards have ceased to function, the discoverer shall immediately bring the situation to the attention of the other party.

10.0 Software Furnished by JPL.

The Contractor and its subcontractors at every tier shall comply with any copyright and limitation of liability notices and any restricted rights legends affixed to any software provided by JPL in the performance of this Contract effort.

Software entitled "_____ " provided by JPL to the Contractor under this Contract is governed by the terms of the "Software License Agreement for use of JPL-Furnished Software under Contract No. _____ " attached and incorporated into this Contract, Exhibit No. (*). The license Agreement and this provision are effective as of the date of this Contract or the date the Software was first provided by JPL for use under this Contract, if earlier. The term "Software" is defined in Exhibit No. (*).

(* insert exhibit number)

11.0 Subcontract Real Property Leases.

If, pursuant to JPL request and/or as a direct charge to this Contract, the Contractor leases or provides real property for use under the Contract, the Contractor must first obtain an environmental audit report acceptable to JPL.

The Contractor's solicitation for the lease shall include the following notices:

REQUIREMENT FOR AN ENVIRONMENTAL AUDIT

OF THE PREMISES

The offeror(s) selected for negotiations will be required to submit prior to award an environmental audit report (report), acceptable to JPL, which identifies the exact extent to which the facilities proposed in response to this solicitation, and the real property in or on which they are situated, ARE, and ARE NOT, in compliance with the applicable requirements of federal, state and local environmental laws, regulations and ordinances. The report shall be prepared and attested to by a firm recognized as conducting environmental

audits acceptable to JPL. The report shall fully disclose any and all hazards and contaminants in/on/under the facilities or real property and the location(s), nature and extent of such hazards or contaminants. The report shall disclose the locations, nature and condition of any and all of the following (but disclosure shall not be limited to these): storage tanks, sumps, pits, dump sites, landfills, pipelines, transformers, capacitors, asbestos, hazardous materials and waste products. The report shall include, or the preparer of the report shall make available to JPL on JPL request, complete documentation, data, laboratory reports, tests and survey results in support of the matters studied and the matters attested to in the report. The report shall be updated just prior to the award of a subcontract for the lease or purchase of the premises.

INVESTIGATION OF PROPOSED SITES BY JPL SAFETY OPERATIONS SECTION PERSONNEL

By submitting its proposal (or quotation or bid), the offeror agrees to submit an environmental audit report required by this notice on request and to assist JPL Safety Operations Section personnel in confirming the environmental audit report findings through a view of the property which is the subject of the report and a review of any supporting documentation.

(end of notices)

The subcontract lease shall contain the substance of the following provisions, in which the "Lessee" or tenant is the JPL Contractor and the "Lessor" or landlord is the subcontractor:

ARTICLE __. MAINTENANCE OF THE PREMISES IN COMPLIANCE WITH ENVIRONMENTAL LAWS AND INDEMNITY FOR HAZARDOUS CONDITIONS

The Lessor warrants that the Leased Premises and the real property in and on which they are situated, are, and Lessor shall at all times maintain the real property and the Leased Premises in, a condition in compliance with applicable federal, state and local environmental laws, regulations and ordinances, except as set forth below:

The Lessor consents, by entering into this Lease, to inspection, at any reasonable time, of the real property in and on which the Leased Premises are situated, by the JPL Safety Operations Section personnel for confirmation of compliance with federal, state, or local environmental laws, regulations and ordinances.

Except for hazardous conditions or environmental law violations directly and willfully attributable to Lessee, the Lessor shall indemnify and defend Lessee and Lessee's directors, officers and employees, the California Institute of Technology/Jet Propulsion Laboratory, and the United States Government, against, and hold all these harmless from, any liability, damages and expenses, including legal fees and the costs of litigation, resulting from any and all conditions and occurrences, and from any and all claims and actions arising from or alleging, noncompliance with any environmental law, regulation or ordinance, and/or which arise from activities or conditions on the Leased Premises or the real property in or on which they are situated.

12.0 Taxes – Withholding

JPL may withhold from any payments, which are due and payable under the Contract, such amounts that JPL determines must be withheld in compliance with State and/or Federal Tax Withholding requirements. JPL shall not be liable for amounts incorrectly withheld under this Provision; provided, however, that if JPL determines that any amounts due to the Contractor have been incorrectly withheld, and said amounts have not already been remitted to the taxing authority, JPL will pay such amounts to the Contractor within a reasonable period of time.

13.0 Use of Government Facilities or Equipment.

Authorization has been received from the appropriate authority for the Contractor to use in the performance of this Contract the Government-owned facilities or equipment specified below which have been provided to the Contractor under Contract No(s). _____ (if applicable). In the event that any change is made in the terms and conditions of such Contract(s) resulting in the unavailability to the Contractor, during the performance of this Contract, of any or all of the specified facilities or equipment, such equitable adjustment as may be appropriate will be made in this Contract.

ITEM	GOVERNMENT PROPERTY NO.
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- NOTE:
- i. If there are either too many items to be listed conveniently or if specific items cannot be identified in advance, the words "All" or "Various" may be used instead of a listing, or a reference may be made to an inventory schedule or a separate Exhibit.
 - ii. The negotiator will contact the cognizant JPL property representative whenever GFP is involved to make sure the property aspects of the contract can be administered properly.

CALIFORNIA INSTITUTE OF TECHNOLOGY JET PROPULSION LABORATORY

GENERAL PROVISIONS: COST-REIMBURSEMENT WITH COMMERCIAL ORGANIZATIONS CONTRACT

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GENERAL PROVISIONS CANNOT BE ALTERED WITHOUT NASA APPROVAL

The following attachments are incorporated into the General Provisions. Submission of an offer and beginning performance constitute certification and recertification per Form JPL 2892.

- Management of Government Property in the Possession of Contractors, Form JPL 0968
- Release of Information, Form JPL 1737
- Affiliate Access Report, Form JPL 1943
- Notification to Prospective Contractors of JPL's Ethics Policies and Anti-Kickback Hotline, Form JPL 2385
- Certifications, Form JPL 2892
- Asbestos Notification, Form JPL 2895
- Notice of Potential Tax Withholding 7/03

ADDITIONAL DATA REQUIREMENTS [CT, FP-NR&D, FPR&D, CREI – 4/99] [FAR 52.227-16 - 6/87]

- (a) In addition to the data (as defined in the "Rights in Data - General" Article or other equivalent included in this Contract) specified elsewhere in this Contract to be delivered, JPL may at any time during Contract performance or within a period of three years after acceptance of all items to be delivered under this Contract, order any data first produced or specifically used in the performance of this Contract.
- (b) The "Rights in Data - General" Article or other equivalent included in this Contract is applicable to all data ordered under this "Additional Data Requirements" Article. Nothing contained in this Article shall require the contractor to deliver any data the withholding of which is authorized by the "Rights in Data - General" Article or other equivalent Article of this Contract, or data which are specifically identified in this Contract as not subject to this Article.
- (c) When data are to be delivered under this Article, the Contractor will be compensated for converting the data into the prescribed form, for reproduction, and for delivery.
- (d) The Contracting Officer through JPL may release the Contractor from the requirements of this Article for specifically identified data items at any time during the three-year period set forth in paragraph (a) above.

AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS [CT, FP-NR&D, FPR&D, CIS, T&MC, LH-T&M, FPC, CREI, A-E – 8/01] [FAR 52.222-36 - 4/84]

(This Article applies to contracts over \$2,500, unless the work is performed outside the United States by employees recruited outside the United States.)

Incorporate by reference FAR 52.222-36, Affirmative Action for Handicapped Workers (29 U.S.C. 793).

AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS [CT, FP-NR&D, FPR&D, CIS, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.222-35 - 4/98]

(This Article applies to contracts over \$10,000, unless the work is performed outside the United States by employees recruited outside the United States.)

Incorporate by reference 52.222-35, Affirmative Action for Special Disabled and Vietnam Era Veterans (38 U.S.C. 4212).

ALLOCATION OF RIGHTS IN PROPERTY AND DATA - COST-SHARE CONTRACTS [CT, CREI – 4/99]

Whether or not this Contract provides for any cost sharing, rights in data and property are determined as though all costs of performance were to be reimbursed by the Institute.

ALLOWABLE COST AND PAYMENT [CT – 4/99] [FAR 52.216-7 – 4/98]

(a) Invoicing and Payment

- (1) The Contractor shall submit an original and three copies of its commercial invoices monthly, unless otherwise provided in the Schedule of the Contract, to: Jet Propulsion Laboratory, Attention: Accounting Section, 4800 Oak Grove Drive, Pasadena, California 91109. The Government "Public Voucher" form of invoicing is not acceptable.
- (2) The Institute shall make payments to the Contractor once each month (or at more frequent intervals if approved by JPL), in amounts determined to be allowable by the Institute in accordance with Subpart 31.2 of FAR in effect on the date of this contract and any corresponding implementing or supplementing provisions in the NFS in effect on the date of this contract and the terms of this Contract. The Contractor may submit, in such form and reasonable detail as JPL may require, an invoice supported by a statement of the claimed allowable cost for performing this Contract.
- (3) JPL may elect to either send payments to the Contractor by mail or require the Contractor to accept electronic payments. Payment shall be deemed to have been made on the date the check is mailed or the date of payment by electronic funds transfer.

(b) Reimbursing Costs

- (1) For the purpose of reimbursing allowable costs (except as provided in subparagraph (2) below, with respect to pension, deferred profit sharing, and employee stock ownership plan contributions), the term "costs" includes only:

- (A) Those recorded costs that, at the time of the request for reimbursement, the Contractor has paid by cash, check, or other form of actual payment for items or services purchased directly for the Contract;
 - (B) When the Contractor is not delinquent in paying costs of Contract performance in the ordinary course of business, costs incurred, but not necessarily paid, for (i) materials issued from the Contractor's inventory and placed in the production process for use on the Contract; (ii) direct labor; (iii) direct travel; (iv) other direct in-house costs; and (v) properly allocable and allowable indirect costs, as shown in the records maintained by the Contractor for purposes of obtaining reimbursement under Government contracts or subcontracts; and
 - (C) The amount of progress payments that have been paid to the Contractor's subcontractors under similar cost standards.
- (2) Contractor contributions to any pension or other post-retirement benefit, profit-sharing, or employee stock ownership plan funds that are paid quarterly or more often may be included in indirect costs for payment purposes; provided, that the Contractor pays the contribution to the fund within 30 days after the close of the period covered. Payments made 30 days or more after the close of a period shall not be included until the Contractor actually makes the payment. Accrued costs for such contributions that are paid less often than quarterly shall be excluded from indirect costs for payment purposes until the Contractor actually makes the payment.
 - (3) Notwithstanding the audit and adjustment of invoices under paragraph (h) below, allowable indirect costs under this Contract shall be obtained by applying indirect cost rates established in accordance with paragraph (e) below.
 - (4) Any statements in specifications or other documents incorporated in this Contract by reference designating performance of services or furnishing of materials at the Contractor's expense or at no cost to the Institute shall be disregarded for purposes of cost-reimbursement under this Article.
- (c) Small Business Concerns. A small business concern may be paid for recorded costs for items or services purchased directly for the Contract, even though the concern has not yet paid for those items or services.
 - (d) (1) Promptly after receipt of each invoice the Institute shall, subject to the provisions of paragraph (h) below, make payment thereon as approved by JPL.
 - (2) Payment of the fee, if any, shall be made to the Contractor as specified in this Contract; provided, however, that after payment of 85% of the fee set forth in the Schedule, further payment on account of the fee may be withheld until a reserve shall have been set aside in an amount which the Institute considers necessary to protect the interests of the Institute and the Government, but such reserve shall not exceed either 15% of the total fee, or \$100,000, whichever is less.
- (e) Final Indirect Cost Rates.
 - (1) Final annual indirect cost rates and the appropriate bases shall be established in accordance with Subpart 42.7 of FAR and any corresponding implementing or supplementing provisions in the NFS in effect for the period covered by the indirect cost rate proposal; provided, however, that the advance understandings, if any, on particular items of cost, as set forth in the Schedule of this Contract shall be given effect, provided further, however, that in the event of any inconsistency between such advance understandings and the cost principles referred to in (a) above, the cost principles shall prevail.
 - (2) A copy of the annual agreement between the Contractor and the Government for each of the periods applicable to this Contract, setting forth the indirect cost rates established in accordance with subparagraph (1) above, shall be furnished by the Contractor to JPL within two weeks after settlement of the final annual indirect cost rates, and shall be deemed to be automatically incorporated into this Contract, subject to the proviso set forth in subparagraph (1) above.
 - (3) Notwithstanding subparagraphs (1) and (2) above, the Contractor and JPL may agree on indirect rates to be used as final indirect rates for this Contract to expedite the administration and closeout of this Contract, provided such rates can be shown to be reasonable under the circumstances.
 - (f) Billing Rates. Until final annual indirect cost rates are established for any period, the Institute shall reimburse the Contractor at billing rates acceptable to JPL, subject to adjustment when the final rates are established. These billing rates:
 - (1) Shall be the anticipated final rates; and

- (2) May be prospectively or retroactively revised by mutual agreement, at either party's request, to prevent substantial overpayment or underpayment.
- (g) Quick-Closeout Procedures. The Contractor and JPL may agree to use any reasonable procedures under the circumstances to expedite closeout, including the quick-closeout procedures of Subpart 42.7 of the FAR and any corresponding implementing or supplementing provisions in the NFS.
- (h) Audit.
- (1) JPL shall perform a risk assessment on this Contract in order to select the appropriate method to be utilized in determining allowable cost. Financial audits by an internal or external agency of cost records and charges shall be performed as is considered warranted by the financial condition, integrity and reliability of the Contractor; prior audit experience; adequacy of the accounting system; and unaudited claims, vouchers, invoices and billings.
- (2) At any time or times before final payment, JPL may have the Contractor's invoices or statements of cost audited. Any payment may be (i) reduced by amounts found by JPL not to constitute allowable costs or (ii) adjusted for prior overpayments or underpayments.
- (i) Final Payment.
- (1) The Contractor shall submit a completion invoice, designated as such, promptly upon completion of the work, but no later than 120 days (or longer, as JPL may approve in writing) from the completion date. Upon approval of that invoice, and upon the Contractor's compliance with all terms of this Contract, the Institute shall promptly pay any balance of allowable costs and that part of the fee (if any) not previously paid.
- (2) The Contractor shall pay to the Institute any refunds, rebates, credits, or other amounts (including interest, if any) accruing to or received by the Contractor or any assignee under this Contract, to the extent that those amounts are properly allocable to costs for which the Contractor has been reimbursed by the Institute. Reasonable expenses incurred by the Contractor for securing refunds, rebates, credits, or other amounts shall be allowable costs if approved by JPL. Before final payment under this Contract, the Contractor and each assignee whose assignment is in effect at the time of final payment shall execute and deliver:
- (A) An assignment to the Institute, in form and substance satisfactory to JPL, of refunds, rebates, credits, or other amounts (including interest, if any) properly allocable to costs for which the Contractor has been reimbursed by the Institute under this Contract; and
- (B) A release discharging the Institute, its officers, agents and employees from all liabilities, obligations, and claims arising out of or under this Contract, except:
- (i) Specified claims stated in exact amounts, or in estimated amounts when the exact amounts are not known;
- (ii) Claims (including reasonable incidental expenses) based upon liabilities of the Contractor to third parties arising out of the performance of this Contract; provided, that the claims are not known to the Contractor on the date of the execution of the release, and that the Contractor gives notice of the claims in writing to JPL within six years following the release date or notice of final payment date, whichever is earlier; and
- (iii) Claims for reimbursement of costs, including reasonable incidental expenses, incurred by the Contractor under the patent provisions of this Contract, excluding, however, any expenses arising from the Contractor's indemnification of the Institute against patent liability.
- (iv) When there is included in this Contract a provision entitled "Additional Data Requirements," claims pursuant to such provision when a written request by the Institute to furnish data is made.
- (C) If the Contractor fails to return the assignment and release described in (A) and (B) above with the release either executed for the amount determined by JPL or with a different amount within 60 days of JPL's request, JPL may make final payment in the amount determined by JPL and the assignment and release (for the JPL-determined amount) described in (A) and (B) above will be deemed to have been executed and delivered by the Contractor.

ANTI-KICKBACK PROCEDURES [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.203-7 – 7/95]

(a) **Definitions.**

- (1) "Kickback," as used in this Article, means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided, directly or indirectly, to any prime Contractor, prime Contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a subcontract relating to a prime contract.
- (2) "Person," as used in this Article, means a corporation, partnership, business association of any kind, trust, joint-stock company, or individual.
- (3) "Prime contract," as used in this Article, means a contract or contractual action entered into by the United States for the purpose of obtaining supplies, materials, equipment, or services of any kind.
- (4) "Prime Contractor," as used in this Article, means a person who has entered into a prime contract with the United States.
- (5) "Prime Contractor employee," as used in this Article, means any officer, partner, employee, or agent of a prime contractor.
- (6) "Subcontract," as used in this Article, means a contract or contractual action entered into by a prime Contractor or subcontractor for the purpose of obtaining supplies, materials, equipment, or services of any kind under a prime contract.
- (7) "Subcontractor," as used in this Article, (i) means any person, other than the prime Contractor, who offers to furnish or furnishes any supplies, materials, equipment, or services of any kind under a prime contract or a subcontract entered into in connection with such prime contract, and (ii) includes any person who offers to furnish or furnishes general supplies to the prime contractor or a higher-tier subcontractor.
- (8) "Subcontractor employee," as used in this Article, means any officer, partner, employee, or agent of a subcontractor.

(b) The Anti-Kickback Act of 1986 (41 U.S.C. 51-58) (the Act), prohibits any person from:

- (1) Providing or attempting to provide or offering to provide any kickback;
- (2) Soliciting, accepting, or attempting to accept any kickback; or
- (3) Including, directly or indirectly, the amount of any kickback in the Contract price charged by a prime Contractor to the United States or in the Contract price charged by a subcontractor to a prime contractor or higher-tier subcontractor.

(c) (1) When the Contractor has reasonable grounds to believe that a violation described in paragraph (b) of this Article may have occurred, the Contractor shall promptly report in writing the possible violation. Such reports shall be made to the inspector general of the contracting agency, the head of the contracting agency if the agency does not have an inspector general, or the Department of Justice.

(2) The Contractor shall cooperate fully with any Federal agency investigating a possible violation described in paragraph (b) of this Article.

(3) The Contractor may (i) offset the amount of the kickback against any monies owed under the Contract and/or (ii) direct that the Contractor withhold, from sums owed a subcontractor under the Contract, the amount of any kickback. JPL may order that monies withheld under subdivision (c)(3)(ii) of this Article be paid over to JPL unless JPL has already offset those monies under subdivision (c)(3)(i) of this Article. In either case, the Contractor shall notify JPL when the monies are withheld.

(4) The Contractor agrees to incorporate the substance of this Article, including this subparagraph (c)(4), in all subcontracts under this Contract.

ASBESTOS NOTIFICATION [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 2/00]

(This Article applies if any of the Contract effort will be performed in JPL-Pasadena buildings. Work performed outside the United States is exempt from the requirements of this Article.)

Contractor acknowledges receipt of the attached "Asbestos Notification," form JPL 2895, identifying JPL buildings containing asbestos and agrees to distribute the Notice to all its personnel prior to their commencing work in such buildings. Contractor agrees to coordinate with the JPL Safety Operations Section for special asbestos handling

instructions to be given to all Contractor's personnel, including subcontractors' personnel, prior to their commencing work, if any, which could disturb asbestos in JPL-controlled buildings. The substance of this Article will be included in all subcontracts issued under this Article for work performed in JPL-Pasadena buildings.

ASSIGNMENT OF RIGHTS AND DELEGATION OF DUTIES [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.232-23(a) – 1/86]

- (a) The Contractor may assign its rights to be paid amounts due or to become due as a result of the performance of this Contract to a bank, trust company, or other financing institution, including any Federal lending agency. The assignee under such an assignment may thereafter further assign or reassign its right under the original assignment to any type of financing institution described in the preceding sentence.
- (b) Any such assignment or reassignment shall be subject to the following conditions:
 - (1) Any assignment or reassignment authorized under this provision shall cover all amounts payable under this Contract, and not paid as of (i) the effective date of assignment or (ii) the date JPL receives written notice of the assignment, whichever is later.
 - (2) No assignment may be made to more than one party, except that an assignment or reassignment may be made to one party as agent or trustee for two or more parties participating in the financing of this Contract.
 - (3) Two copies of the notice of assignment, signed by the Contractor, shall be furnished to JPL, Attn: Accounts Payable.
 - (4) If a party other than the Contractor provides JPL with a notification that the amount due or to become due under this Contract has been assigned and that payment is to be made to the claimed assignee, JPL may withhold any payments which are due and payable under the Contract until JPL is furnished with either (i) verification or denial of assignment from the Contractor or (ii) reasonable proof that the assignment has been made.
 - (5) The Contractor shall not furnish or disclose to any assignee under this Contract any classified document (which term includes this Contract if access to classified material is authorized under this Contract) or information pertaining to classified work under this Contract unless JPL authorizes such action in writing.
 - (6) No assignment may be made which includes, either specifically or by implication, any delegation of the Contractor's duty to perform the services or provide the supplies required by this Contract unless such assignment and delegation is consented to by JPL in accordance with the provisions of paragraph (c) below.
- (c) The Contractor is prohibited, without prior written JPL consent, from delegating any part of the duties required of it by this Contract; provided, however, that nothing contained herein shall be deemed to prohibit the Contractor from placing purchase orders and subcontracts, subject, however, to the provision of this Contract entitled "Subcontracts." Delegation of duties without such consent is void.

AUDIT AND EXAMINATION OF RECORDS – NEGOTIATION [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.215-2 – 8/96]

(This provision is not applicable for procurements of \$100,000 or less, for commercial items, or for utility services at rates not exceeding those established to apply uniformly to the general public, plus any applicable reasonable connection charge.)

- (a) As used in this Article, "records" includes books, documents, accounting procedures and practices, and other data, regardless of type and regardless of whether such items are in written form, in the form of computer data, or in any other form.
- (b) Examination of Costs. If this is a cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable Contract, or any combination of these, the Contractor shall maintain and the Contracting Officer, or an authorized representative of the Contracting Officer, shall have the right to examine and audit all records and other evidence sufficient to reflect properly all costs claimed to have been incurred or anticipated to be incurred directly or indirectly in performance of this Contract. This right of examination shall include inspection at all reasonable times of the Contractor's plants, or parts of them, engaged in performing the Contract.
- (c) Cost or Pricing Data. If the Contractor has been required to submit cost or pricing data in connection with pricing action relating to this Contract, the Contracting Officer, or an authorized representative of the Contracting Officer, in order to evaluate the accuracy, completeness, and currency of the cost or pricing data, shall have the right to examine and audit all of the Contractor's records, including computations and projections, related to:
 - (1) The proposal for the Contract, subcontract, or modification;

- (2) The discussions conducted on the proposal(s), including those related to negotiating;
 - (3) Pricing of the Contract, subcontract, or modification; or
 - (4) Performance of the Contract, subcontract, or modification.
- (d) Comptroller General.
- (1) The Comptroller General of the United States, or an authorized representative, shall have access to and the right to examine any of the Contractor's directly pertinent records involving transactions related to this Contract or a subcontract hereunder.
 - (2) This paragraph (d) may not be construed to require the Contractor or subcontractor to create or maintain any record that the Contractor or subcontractor does not maintain in the ordinary course of business or pursuant to a provision of law.
- (e) Reports. If the Contractor is required to furnish cost, funding, or performance reports, the Contracting Officer or an authorized representative of the Contracting Officer shall have the right to examine and audit the supporting records and materials, for the purpose of evaluating (i) the effectiveness of the Contractor's policies and procedures to produce data compatible with the objectives of these reports and (ii) the data reported.
- (f) Availability. The Contractor shall make available at its office at all reasonable times the records, materials, and other evidence described in paragraphs (a), (b), (c), (d), and (e) of this Article, for examination, audit, or reproduction, until three years after final payment under this Contract, or for any shorter period specified in Subpart 4.7, Contractor Records Retention, of FAR, and any corresponding implementing or supplementing provisions in the NFS, or for any longer period required by statute or by other Articles of this Contract. In addition:
- (1) If this Contract is completely or partially terminated, the records relating to the work terminated shall be made available for three years after any resulting final termination settlement; and
 - (2) Records relating to appeals under the Disputes clause of the Government Prime Contract, or if this Contract contains a "Disputes" Article, to appeals under such Article, or to litigation or the settlement of claims arising under or relating to this Contract, shall be made available until such appeals, litigation, or claims are finally resolved.
- (g) (1) The Contractor shall insert all of the provisions of this Article, including this paragraph (g), in all subcontracts under this Contract that exceed \$100,000, and:
- (A) That are cost-reimbursement, incentive, time-and-materials, labor-hour, or price-redeterminable type or any combination of these;
 - (B) For which cost or pricing data are required; or
 - (C) That require the subcontractor to furnish reports as discussed in paragraph (e) of this clause.
- (2) The Article may be altered only as necessary to identify properly the contracting parties and the Contracting Officer under the Government Prime Contract.
- (h) If this is a cost-reimbursement contract with an educational or other nonprofit institution, the provisions of OMB Circular No. A-133, "Audits of Institutions of Higher Learning and Other Nonprofit Institutions," apply to this Contract.

AUTHORITY OF JPL REPRESENTATIVES [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99]

- (a) No request, notice, authorization, direction or order received by the Contractor and issued either pursuant to a provision of this Contract, to a provision of any document incorporated in this Contract by reference, or otherwise, shall be binding upon either the Contractor or the Institute unless issued or ratified in writing by the JPL Negotiator, the Manager, Acquisition Division, JPL, or by representative(s) designated in writing by either of them. Designations of authorized representatives shall define the scope and limitations of the authorized representatives' authorities.
- (b) The Contractor shall immediately notify, in writing, the JPL Negotiator, or the Manager, Acquisition Division, JPL, whenever a request, notice, authorization, direction, or order has been received from a representative of JPL other than the JPL Negotiator, or the Manager, Acquisition Division, JPL, which, but for the lack of authorization on the part of the issuing JPL representative, would: (i) effect a change within the meaning of the "Changes" Article; (ii) increase or decrease the Contract amount or amount allotted to this Contract; or (iii) otherwise be the basis for assertion of a claim by the Contractor under any provision of the Contract.

AUTHORIZATION AND CONSENT [CT, FP-R&D, T&MC, LH-T&M, CREI, A-E – 4/99] [FAR 52.227-1 – 7/95, ALT I]

- (a) The Government authorizes and consents to all use and manufacture of any invention described in and covered by a United States patent in the performance of the Prime Contract or any subcontract at any tier.
- (b) The Contractor agrees to include, and require inclusion of, this Article, suitably modified to identify the parties, in all subcontracts at any tier for supplies or services (including construction, architect-engineer services, and materials, supplies, models, samples, and design or testing services expected to exceed \$100,000); however, omission of this Article from any subcontract, under or over \$100,000, does not affect this authorization and consent.

BANKRUPTCY [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.242-13, 7/95]

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish, by certified mail or electronic commerce method authorized by the Contract, written notification of the bankruptcy to the JPL negotiator responsible for administering the Contract. This notification shall be furnished within five days of the initiation of the proceedings relating to bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of JPL contract numbers for all JPL contracts against which final payment has not been made. This obligation remains in effect until final payment under this Contract.

BUY AMERICAN ACT – SUPPLIES [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, CREI – 4/99] [FAR 52.225-3 - 1/94]

(This Article applies to supply contracts exceeding \$2,500 and to contracts for services which involve the furnishing of supplies when the supply portion of the contract exceeds \$2,500.)

Incorporate by reference FAR 52.225-3, Buy American Act - Supplies.

CHANGES – COST [CT – 4/99] [FAR 52.243-2, Alt. V – 8/87; FAR 52.243-6 – 4/84]

- (a) JPL may at any time, by written Contract Unilateral Modification, and without notice to the sureties, if any, make changes within the general scope of this Contract in any one or more of the following:
 - (1) Drawings, designs, or specifications.
 - (2) Method of shipment or packing.
 - (3) Place of inspection, delivery, or acceptance.
 - (4) Description of services to be performed.
 - (5) Time of performance (i.e., hours of the day, days of the week, etc.).
 - (6) Place of performance of the services.
 - (7) Requiring additional work or directing the omission of or variation in work covered by this Contract when time is of the essence and the change has been coordinated with and is acceptable to the subcontractor prior to issuance of the unilateral change.
- (b) If any such change causes an increase or decrease in the estimated cost of, or the time required for, performance of any part of the work under this Contract, whether or not changed by the Modification, or otherwise affects any other terms and conditions of this Contract, JPL shall make an equitable adjustment in the (i) estimated cost, delivery or completion schedule, or both; (ii) amount of any fee; and (iii) other affected terms, and shall modify the Contract accordingly.
- (c) The Contractor must assert its right to an adjustment under this Article within 30 days from the date of receipt of the Modification. However, if JPL decides that the facts justify it, JPL may receive and act upon a proposal submitted before final payment of the Contract.
- (d) JPL may require change order accounting when deemed necessary. The Contractor, for each change or series of related changes, shall maintain separate accounts, by job order or other suitable accounting procedure, of all incurred segregable, direct costs (less allocable credits) of work, both changed and not changed, allocable to the change. The Contractor shall maintain such accounts until the parties agree to an equitable adjustment for the changes ordered by JPL.
- (e) Except as provided in paragraph (f) below, nothing contained in this Article shall excuse the Contractor from proceeding with the prosecution of the work as modified.

- (f) Notwithstanding the provisions of paragraphs (a) and (b) above, the estimated cost of this Contract and, if this Contract is incrementally funded, the funds allotted for the performance of this Contract, shall not be increased or considered to be increased except by specific written modification of the Contract indicating the new contract estimated cost and, if this Contract is incrementally funded, the new amount allotted to the Contract. Until this modification is made, the Contractor shall not be obligated to continue performance or incur costs beyond the point established in the Limitation of Cost or Limitation of Funds Article of this Contract.

CLEAN AIR AND WATER [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 8/01] [FAR 23.104 – 4/84; 52.223-2 - 4/84]

(This Article does not apply to the use of facilities outside the United States. The Article applies to the Contract if it exceeds \$100,000 [or \$100,000 in one year for an indefinite delivery contract], or the facility to be used has been the subject of a conviction under the Air Act or Water Act and is listed by the EPA as a violating facility, and the acquisition is not otherwise exempt under FAR 23.104.)

Incorporate by reference FAR 52.223-2, Clean Air and Water (April 1984).

COMPLIANCE WITH EXPORT REGULATIONS [CT, FP-NR&D FP-R&D, CIS, T&MC, LH-T&M, FPC, CREI – 5-00]

- (a) Hardware, software and related materials, including technical data, may be subject to U.S. export control laws, including the U.S. Export Administration Act, Arms Export Control Act, and their associated regulations, and may be subject to export or import regulations in other countries. Contractor agrees to strictly comply with all U.S. Export Control Regulations and acknowledges that, when applicable, it has the responsibility to obtain export licenses, or other export authority as may be required, for hardware, software, and related materials and services, including technical data, related to the performance of this Contract, which are in its possession or under its control.
- (b) JPL's NASA Contracting Officer is required to provide reports to NASA headquarters on the status and location of government property which has left United States Territory. Contractor will not export any government property without prior approval from the NASA CO through the JPL negotiator.
- (c) (1) The International Traffic in Arms Regulation (ITAR) 22 CFR Parts 120 to 130 inclusive, and Export Administration Regulation (EAR) 15 CFR parts 730 to 774 inclusive, restrict foreign national access to technological information. This information is available on JPL Web Space, in unpublished JPL documents, through technical conversations with JPL employees, and through visual inspection of JPL hardware. For the purpose of this clause, foreign nationals are defined as all individuals in the United States or overseas who are not U.S. Citizens, holders of U.S. green cards, or holders of political asylum papers issued by the U.S. Department of State.
- (2) The Contractor shall not allow access by any foreign national to: JPL material which reveals technology, financial information, or business strategy information, and to JPL internal Web Space in performance of this Contract, without prior written approval by JPL Security, the JPL Network and Computer Security Group, and the JPL International and Legislative Affairs Office through the JPL Negotiator.
- (d) Contractor agrees to insert this clause, including this paragraph, in all subcontracts which could involve: an export as defined in the ITAR and EAR, subcontractor employee access to JPL Web Space, or subcontractor employee access to JPL material which reveals technology, financial information, or business strategy information.

COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT [CT, CREI – 8/01]

(Work performed outside the United States is exempt from the requirements of this Article.)

- (a) Contractor agrees to comply with the Americans with Disabilities Act (42 U.S.C. 12101, et. seq.) and all implementing regulations.
- (b) Contractor agrees to insert this Article, including this paragraph (b), in all subcontracts and purchase orders hereunder.

CONTRACT WORK HOURS AND SAFETY STANDARDS ACT - OVERTIME COMPENSATION [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 8/01] [FAR 22.305 - 7/95; 52.222-4 - 7/95]

(Work performed outside the United States is exempt from the requirements of this Article.)

- (a) This provision is not applicable to contracts for supplies, materials, or articles ordinarily available in the open market, contracts for transportation by land, air, or water, or for the transmission of intelligence, contracts of

\$100,000 or less, contracts to be performed solely within a foreign country or within a territory under United States jurisdiction other than a state, the District of Columbia, Puerto Rico, the Virgin Islands, Outer Continental Shelf Lands as defined in the Outer Continental Shelf Lands Act, American Samoa, Guam, Wake Island, and Johnson Island, and contracts (or portions of contracts) for supplies in connection with which any required services are merely incidental to the contract and do not require substantial employment of laborers or mechanics, exempt under regulations of the Secretary of Labor (29 CFR 5.15), contracts requiring work to be done solely in accordance with the Walsh-Healey Public Contract Acts, and contracts for commercial items.

- (b) FAR clause 52.222-4 (July 1995) is hereby incorporated by reference in toto, except that:
- (1) The words "JPL negotiator or JPL's Contracting Officer" shall be substituted for the words "Contracting Officer" wherever they appear;
 - (2) The word "Contractor" shall be substituted for the words "Prime Contractor" wherever they appear; and
 - (3) The words "with JPL" shall be substituted for the words "Federal Contract with the same Prime Contractor" wherever they appear.

CONTRACTOR AND SUBCONTRACTOR COST OR PRICING DATA, OR INFORMATION OTHER THAN COST OR PRICING DATA AND PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, A-E - 8/01] [FAR 15.403-4 - 10/00; 52.215-11 - 10/97; 52.215-12 - 10/97; 52.215-13 - 10/97; 52.215-20 - 10/97; 52.215-21 - 10/97]

(This Article is applicable if either the basic Contract or any modification exceeds \$550,000.)

(a) Contractor Cost or Pricing Data.

- (1) Whenever the negotiated price of the basic Contract, or the negotiated price of any change, or other modification to this Contract is expected to exceed \$550,000, the Contractor agrees to furnish the Institute certified cost or pricing data, unless a waiver applies or a determination is made that an exception applies (the price is based on adequate price competition, prices set by law or regulation, or the contract is for a commercial item). Whenever certified cost or pricing data are required, the Contractor agrees to furnish the data in the format requested by JPL or if JPL does not so specify, per Table 15-2 of FAR 15.408 and agrees to submit the JPL certificate form JPL 2496 or equivalent as soon as practicable after agreement on price but before award.
- (2) Exceptions to Cost or Pricing Data.
 - (A) (i) Basic Contracts. In lieu of submitting cost or pricing data for the basic Contract, offerors may submit a written request for exception by submitting the information described under paragraph (B), below.
 - (ii) Contract Modifications. In lieu of submitting cost or pricing data for modifications under this Contract, for price adjustments expected to exceed \$550,000 on the date of the agreement on price or the date of the award, whichever is later, the Contractor may submit a written request for exception by submitting the information described under paragraph (B), below.
 - (iii) JPL may require additional supporting information, but only to the extent necessary to determine whether an exception should be granted, and whether the price is fair and reasonable.
- (B) The relevant part of the following information is to be submitted when requesting an exception:
 - (i) Identification of the law or regulation establishing the price offered. If the price is controlled under law by periodic rulings, reviews, or similar actions of a governmental body, attach a copy of the controlling document, unless it was previously submitted to the contracting office.
 - (ii) For a commercial item exception, the offeror shall submit, at a minimum, information on prices at which the same item or similar items have previously been sold that is adequate for evaluating the reasonableness of the price for this acquisition. Such information may include:
 - a. For catalog items, a copy of or identification of the catalog and its date, or the appropriate pages for the offered items, or a statement that the catalog is on file in the buying office to which the proposal is being submitted. Provide a copy or describe current discount policies and price lists (published or unpublished), e.g., wholesale, original equipment manufacturer, or reseller. Also explain the basis of each offered price and its relationship to the established catalog price, including how the proposed price relates to the price of recent sales in quantities similar to the proposed quantities.

- b. For market-priced items, the source and date or period of the market quotation or other basis for market price, the base amount, and applicable discounts. In addition, describe the nature of the market.
 - c. For items included on an active Federal Supply Service Multiple Award Schedule or any other Federal Government contract, proof that an exception has been granted for the schedule item.
 - (iii) Information on modifications of contracts or subcontracts for commercial items. If (i) the original Contract or subcontract was granted an exception from cost or pricing data requirements because the price agreed upon was based on adequate price competition, or prices set by law or regulation, or was a contract or subcontract for a commercial item; and (ii) the modification (to the Contract or subcontract) is not exempted based on one of these exceptions, then the Contractor may provide information to establish that the modification would not change the Contract or subcontract from a contract or subcontract for the acquisition of a commercial item to a contract or subcontract for the acquisition of an item other than a commercial item.
 - (C) The Offeror/Contractor grants JPL or an authorized representative the right to examine, at any time before award, books, records, documents, or other directly pertinent records to verify any request for an exception under this provision, and the reasonableness of price. For items priced using catalog or market prices, or law or regulation, access does not extend to cost or profit information or other data relevant solely to the Offeror's/Contractor's determination of the prices to be offered in the catalog or marketplace.
- (b) Subcontractor Cost or Pricing Data.
- (1) Before awarding any subcontract expected to exceed \$550,000 when entered into, or before pricing any subcontract modification involving a pricing adjustment expected to exceed \$550,000, the Contractor shall require the subcontractor to submit cost or pricing data (actually or by specific identification in writing), unless the subcontract or modification is eligible for an exception listed in paragraph (a), above.
 - (2) The requirement for obtaining certified cost or pricing data with respect to any subcontract change or other modification does not apply to any subcontract change or modification, at any tier, where this Contract is a firm fixed-price or firm fixed-price with escalation contract unless such change or other modification results from a Contract change or other modification to this Contract, nor does it apply to a subcontract change or other modification, at any tier, where this Contract is not firm fixed-price or firm fixed-price with escalation, unless the price for such change or modification becomes reimbursable under this Contract.
 - (3) The Contractor shall require the subcontractor to certify in substantially the form prescribed in FAR Part 15, and any corresponding implementing or supplementing provisions in the NFS, that, to the best of its knowledge and belief, the data submitted under subparagraph (b)(1) above were accurate, complete, and current as of the date of agreement on the negotiated price of the subcontract or subcontract modification.
 - (4) In each subcontract that exceeds \$550,000 when entered into, the Contractor shall insert either:
 - (A) The substance of this Article, including this paragraph (4), if paragraph (b)(1) above requires submission of cost or pricing data for the subcontract; or
 - (B) The substance of the clause at FAR 52.215-13, "Subcontractor Cost or Pricing Data - Modifications," including any corresponding implementing or supplementing provisions in the NFS.
- (c) Price Reduction for Defective Cost or Pricing Data.
- (1) If any price, including profit or fee, negotiated in connection with this Contract, or any cost reimbursable under this Contract, was increased by any significant amount because (i) the Contractor or a subcontractor furnished cost or pricing data that were not complete, accurate, and current as certified in its Certificate of Current Cost or Pricing Data, (ii) a subcontractor or prospective subcontractor furnished the Contractor cost or pricing data that were not complete, accurate, and current as certified in the Contractor's Certificate of Current Cost or Pricing Data, or (iii) any of these parties furnished data of any description that were not accurate, the price or cost shall be reduced accordingly and the Contract shall be modified to reflect the reduction.
 - (2) Any reduction in the Contract price under paragraph (1) above due to defective data from a prospective subcontractor that was not subsequently awarded the subcontract shall be limited to the amount, plus applicable overhead and profit markup, by which (i) the actual subcontract or (ii) the actual cost to the Contractor, if there was no subcontract, was less than the prospective subcontract cost estimate submitted

by the Contractor; provided, that the actual subcontract price was not itself affected by defective cost or pricing data.

- (3) (A) If the Contracting Officer determines under paragraph (1) of this Article that a price or cost reduction should be made, the Contractor agrees not to raise the following matters as a defense:
- (i) The Contractor or subcontractor was a sole source supplier or otherwise was in a superior bargaining position and thus the price of the Contract would not have been modified even if accurate, complete, and current cost or pricing data had been submitted.
 - (ii) The Institute should have known that the cost or pricing data in issue were defective even though the Contractor or subcontractor took no affirmative action to bring the character of the data to the attention of JPL.
 - (iii) The Contract was based on an agreement about the total cost of the Contract and there was no agreement about the cost of each item procured under the Contract.
 - (iv) The Contractor or subcontractor did not submit a Certificate of Current Cost or Pricing Data.
- (B) (i) Except as prohibited by subdivision (c)(3)(B)(ii) of this Article, an offset in an amount determined appropriate by the Contracting Officer based upon the facts shall be allowed against the amount of a Contract price reduction if:
- a. The Contractor certifies to the Contracting Officer that, to the best of the Contractor's knowledge and belief, the Contractor is entitled to the offset in the amount requested; and
 - b. The Contractor proves that the cost or pricing data were available before the "as of" date specified on its Certificate of Current Cost or Pricing Data and that the data were not submitted before such date.
- (ii) An offset shall not be allowed if:
- a. The understated data was known by the Contractor to be understated when the Certificate of Current Cost or Pricing Data was signed; or
 - b. The Government proves that the facts demonstrate that the Contract price would not have increased in the amount to be offset even if the available data had been submitted before the "as of" date specified on its Certificate of Current Cost or Pricing Data.
- (4) In the event of a disagreement between the Contracting Officer and the Contractor with respect to a question of fact involved in the Contracting Officer's determination to reduce the price of this Contract, the Contractor may, subject to the prior approval of the Institute, which approval will not be unreasonably withheld, process such disagreement as a dispute to the extent that it may be entitled to do so under the provisions of the Prime Contract.
- (d) If any reduction in the Contract price under this Article reduces the price of items for which payment was made prior to the date of the modification reflecting the price reduction, the Contractor shall be liable to and shall indemnify the Institute for costs incurred by the Institute involved in repayments to the Government resulting from the Contractor's defective pricing including:
- (1) Simple interest on the amount of such overpayment to be computed from the date(s) of overpayment to the Contractor to the date the Government is repaid by the Institute at the applicable underpayment rate effective for each quarter prescribed by the Secretary of the Treasury under 26 U.S.C. 6621(a)(2); and
 - (2) A penalty equal to the amount of the overpayment, if the Contractor or subcontractor knowingly submitted cost or pricing data which were incomplete, inaccurate, or noncurrent.

CONTRACTOR EMPLOYMENT OF JPL EMPLOYEES' CHILDREN AND RELATIVES (CONTRACTOR'S EMPLOYEES IN RESIDENCE AT JPL) [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M – 2/00]

(Work performed outside the United States is exempt from the requirements of this Article.)

- (a) When work under this Contract is to be performed at any JPL-controlled facility, the Contractor agrees to require applicants for such work, as part of the application process, to identify any relatives they know to be employed at JPL. The Contractor also agrees to notify the cognizant negotiator prior to hiring an applicant who so identifies a relative. The Contractor agrees to abide by JPL's determination as to whether the applicant may be assigned to a particular JPL organization.

- (b) The term "relatives" means parents, stepparents, grandparents, sisters, brothers, spouse/same-sex-domestic-partner, children, stepchildren, grandchildren, aunts, uncles, nieces, nephews, legal wards, and spouse's parents, grandparents, sisters and brothers.

CONTRACTOR RECRUITING ACTIVITY [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC – 2/00]

(Work performed outside the United States is exempt from the requirements of this Article.)

Except as may be specifically authorized by JPL in writing, during the performance of this Contract the Contractor shall refrain from engaging in any activity related to employment recruiting on any of the premises of JPL.

CROSS-WAIVERS OF LIABILITY FOR SPACE SHUTTLE SERVICES, NASA EXPENDABLE LAUNCH VEHICLE (ELV) LAUNCHES, AND FOR SPACE STATION ACTIVITIES [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M – 4/99] [NFS 1852.228-72 - 9/93; 1852.228-78 – 9/93; 1852.228-76 – 12/94]

(This Article is applicable if the Contract value is \$100,000 or more.)

The Contractor understands that the work performed under this Contract may be in support of "Protected Space Operations" as defined in the three paragraphs (b)(5) under Part A, Part B, and Part C below, and therefore agrees to all three cross-waiver provisions set forth below. The Contractor shall incorporate this Article into subcontracts which are for \$100,000 or more.

PART A. CROSS-WAIVER OF LIABILITY FOR SPACE SHUTTLE SERVICES

- (a) As prescribed by regulation (14 C.F.R. Part 1266), NASA agreements involving Space Shuttle services are required to contain broad cross-waivers of liability among the parties and the parties' related entities to encourage participation in space exploration, use, and investment. The purpose of this provision is to extend this cross-waiver requirement to contractors and related entities under their contracts. This cross-waiver of liability shall be broadly construed to achieve the objective of encouraging participation in space activities.
- (b) As used in this provision, the term:
- (1) "Contractors" and "Subcontractors" include suppliers of any kind.
 - (2) "Damage" means:
 - (A) Bodily injury to, or other impairment of health of, or death of, any person;
 - (B) Damage to, loss of, or loss of use of any property;
 - (C) Loss of revenue or profits; or
 - (D) Other direct, indirect, or consequential damage;
 - (3) "Party" means a person or entity that signs an agreement involving a Space Shuttle service;
 - (4) "Payload" means any property to be flown or used on or in the Space Shuttle; and
 - (5) "Protected Space Operations" means all Space Shuttle and payload activities on Earth, in outer space, or in transit between Earth and outer space performed in furtherance of an agreement involving Space Shuttle services or performed under this Contract. "Protected Space Operations" excludes activities on Earth which are conducted on return from space to develop further a payload's product or process except when such development is for Space Shuttle-related activities necessary to implement an agreement involving Space Shuttle services or to perform this Contract. It includes, but is not limited to:
 - (A) Research, design, development, test, manufacture, assembly, integration, operation, or use of the Space Shuttle, transfer vehicles, payloads, related support equipment, and facilities and services;
 - (B) All activities related to ground support, test, training, simulation, or guidance and control equipment and related facilities or services.
 - (6) "Related entity" means:
 - (A) A party's contractors or subcontractors at any tier;
 - (B) A party's users or customers at any tier; or
 - (C) A contractor or subcontractor of a party's user or customer at any tier.
- (c) (1) The Contractor agrees to a waiver of liability pursuant to which the Contractor waives all claims against any of the entities or persons listed in paragraphs (c)(1)(A) through (c)(1)(C) of this provision based on damage

arising out of Protected Space Operations. This waiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The waiver shall apply to any claims for damage, whatever the legal basis for such claims, including but not limited to delict (a term used in civil law countries to denote a class of cases similar to tort) and tort (including negligence of every degree and kind) and contract, against:

- (A) Any party other than the Government;
 - (B) A related entity of any party other than the Government; and
 - (C) The employees of any of the entities identified in (c)(1)(A) and (c)(1)(B) above.
- (2) The Contractor agrees to extend the waiver of liability as set forth in paragraph (c)(1) of this provision to subcontractors at any tier by requiring them, by contract or otherwise, to agree to waive all claims against the entities or persons identified in paragraphs (c)(1)(A) through (c)(1)(C) of this provision.
- (3) For avoidance of doubt, this cross-waiver includes a cross-waiver of liability arising from the Convention on International Liability for Damage Caused by Space Objects (March 29, 1972, 24 United States Treaties and other International Agreements (U.S.T.) 2389), Treaties and Other International Acts Series (T.I.A.S.) No. 7762 in which the person, entity, or property causing the damage is involved in Protected Space Operations, and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations.
- (4) Notwithstanding the other provisions of this provision, this waiver of liability shall not be applicable to:
- (A) Claims between any party and its related entities or claims between any party's related entities (e.g., claims between the Government and the Contractor are included within this exception);
 - (B) Claims made by a natural person, his/her estate, survivors, or subrogees for injury or death of such natural person;
 - (C) Claims for damage caused by willful misconduct; and
 - (D) Intellectual property claims.
- (5) Nothing in this section shall be construed to create the basis for a claim or suit where none would otherwise exist.

PART B. CROSS-WAIVER OF LIABILITY FOR NASA EXPENDABLE LAUNCH VEHICLE (ELV) LAUNCHES

- (a) As prescribed by regulation (14 C.F.R. Part 1266), NASA agreements involving ELV launches are required to contain broad cross-waivers of liability among the parties and the parties' related entities to encourage participation in space exploration, use, and investment. The purpose of this provision is to extend this cross-waiver requirement to contractors and subcontractors as related entities of NASA. This cross-waiver of liability shall be broadly construed to achieve the objective of encouraging participation in space activities.
- (b) As used in this provision, the term:
- (1) "Contractors" and "Subcontractors" include suppliers of any kind.
 - (2) "Damage" means:
 - (A) Bodily injury to, or other impairment of health of, or death of, any person;
 - (B) Damage to, loss of, or loss of use of any property;
 - (C) Loss of revenue or profits; or
 - (D) Other direct, indirect, or consequential damage;
 - (3) "Party" means a person or entity that signs an agreement involving an ELV launch;
 - (4) "Payload" means any property to be flown or used on or in the ELV; and
 - (5) "Protected Space Operations" means all ELV and payload activities on Earth, in outer space, or in transit between Earth and outer space performed in furtherance of an agreement involving an ELV launch or performed under the Contract. "Protected Space Operations" excludes activities on Earth which are conducted on return from space to develop further a payload's product or process except when such

development is for ELV-related activities necessary to implement an agreement involving an ELV launch or to perform the contract. It includes, but is not limited to:

- (A) Research, design, development, test, manufacture, assembly, integration, operation, or use of ELVs, transfer vehicles, payloads, related support equipment, and facilities and services;
- (B) All activities related to ground support, test, training, simulation, or guidance and control equipment and related facilities or services.

(6) "Related entity" means:

- (A) A party's contractors or subcontractors at any tier;
- (B) A party's users or customers at any tier; or
- (C) A contractor or subcontractor of a party's user or customer at any tier.

(c) (1) The Contractor agrees to a waiver of liability pursuant to which the Contractor waives all claims against any of the entities or persons listed in paragraphs (c)(1)(A) through (c)(1)(C) of this provision based on damage arising out of Protected Space Operations. This waiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The waiver shall apply to any claims for damage, whatever the legal basis for such claims, including but not limited to a delict (a term used in civil law countries to denote a class of cases similar to tort) and tort (including negligence of every degree and kind) and contract, against:

- (A) Any party other than the Government;
- (B) A related entity of any party other than the Government; and
- (C) The employees of any of the entities identified in (c)(1)(A) and (B) above.

(2) The Contractor agrees to extend the waiver of liability as set forth in paragraph (c)(1) of this provision to subcontractors at any tier by requiring them, by contract or otherwise, to agree to waive all claims against the entities or persons identified in paragraphs (c)(1)(A) through (c)(1)(C) of this provision.

(3) For avoidance of doubt, this cross-waiver includes a cross-waiver of liability arising from the Convention on International Liability for Damage Caused by Space Objects, (March 29, 1972, 24 United States Treaties and other International Agreements (U.S.T.) 2389, Treaties and Other International Acts Series (T.I.A.S.) No. 7762) in which the person, entity, or property causing the damage is involved in Protected Space Operations.

(4) Notwithstanding the other provisions of this provision, this waiver of liability shall not be applicable to:

- (A) Claims between any party and its related entities or claims between any party's related entities (e.g., claims between the Government and the Contractor are included within this exception);
- (B) Claims made by a natural person, his/her estate, survivors, or subrogees for injury or death of such natural person;
- (C) Claims for damage caused by willful misconduct; and
- (D) Intellectual property claims.

(5) Nothing in this section shall be construed to create the basis for a claim or suit where none would otherwise exist.

(6) This cross-waiver shall not be applicable when the Commercial Space Launch Act cross-waiver (49 U.S.C. App. 2615) is applicable.

PART C. CROSS-WAIVER OF LIABILITY FOR SPACE STATION ACTIVITIES

(a) The Intergovernmental Agreement for Space Station Freedom contains a broad cross-waiver provision to encourage participation in the exploration and use of outer space through the Space Station. The purpose of this provision is to extend this cross-waiver requirement to contractors and subcontractors as related entities of NASA. This cross-waiver of liability shall be broadly construed to achieve this objective of encouraging participation in space activities.

(b) As used in this provision, the term:

- (1) "Damage" means:
 - (A) Bodily injury to, or other impairment of health of, or death of, any person;
 - (B) Damage to, loss of, or loss of use of any property;
 - (C) Loss of revenue or profits; or
 - (D) Other direct, indirect, or consequential damage.
- (2) "Launch Vehicle" means an object (or any part thereof) intended for launch, launched from Earth, or returning to Earth which carries payloads or persons, or both.
- (3) "Partner State" means each contracting party for which the "Agreement among the Government of the United States of America, Governments of Member States of the European Space Agency, Government of Japan, and the Government of Canada on Cooperation in the Detailed Design, Development, Operation, and Utilization of the Permanently Manned Civil Space Station" (the "Intergovernmental Agreement") has entered into force, in accordance with Article 25 of the Intergovernmental Agreement, and also includes any future signatories of the Intergovernmental Agreement. It includes the Cooperating Agency of a Partner State. The National Aeronautics and Space Administration (NASA) for the United States, the Canadian Space Agency (CSA) for the Government of Canada, the European Space Agency (ESA), and the Science and Technology Agency of Japan (STA) are the Cooperating Agencies responsible for implementing Space Station cooperation. A Partner State also includes any entity specified in the Memorandum of Understanding (MOU) between NASA and the Government of Japan to assist the Government of Japan Cooperating Agency in the implementation of that MOU.
- (4) "Payload" means any property to be flown or used on or in a launch vehicle or the Space Station.
- (5) "Protected Space Operations" means all launch vehicle activities, space station activities, and payload activities on Earth, in outer space, or in transit between Earth and outer space performed in furtherance of the Intergovernmental Agreement or performed under this Contract. "Protected Space Operations" also includes all activities related to evolution of the Space Station as provided for in Article 14 of the Intergovernmental Agreement. "Protected Space Operations" excludes activities on Earth which are conducted on return from the Space Station to develop further a payload's product or process except when such development is for Space Station-related activities in implementation of the Intergovernmental Agreement or in performance of this Contract. It includes, but is not limited to:
 - (A) Research, design, development, test, manufacture, assembly, integration, operation, or use of launch or transfer vehicles, payloads, related support equipment, and facilities and services;
 - (B) All activities related to ground support, test, training, simulation, or guidance and control equipment and related facilities or services.
- (6) "Related entity" means:
 - (A) A Partner State's contractors or subcontracts at any tier;
 - (B) A Partner State's users or customers at any tier; or
 - (C) A contractor or subcontractor of a Partner State's user or customer at any tier.
- (7) "Contractors" and "Subcontractors" include suppliers of any kind.
- (c) (1) The Contractor agrees to a cross-waiver of liability pursuant to which the Contractor waives all claims against any of the entities or persons listed in paragraphs (c)(1)(A) through (c)(1)(C) of this provision based on damage arising out of Protected Space Operations. This waiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The cross-waiver shall apply to any claims for damage, whatever the legal basis for such claims, including but not limited to delict (a term used in civil law countries to denote a class of cases similar to tort) and tort (including negligence of every degree and kind) and contract against:
 - (A) Any Partner State other than the United States;
 - (B) A related entity of any Partner State other than the United States; and
 - (C) The employees of any of the entities identified in paragraphs (c)(1)(A) and (B) above.

- (2) The Contractor agrees to extend the waiver of liability as set forth in paragraph (c)(1) of this provision to subcontractors at any tier by requiring them, by contract or otherwise, to agree to waive all claims against the entities or persons identified in paragraphs (c)(1)(A) through (c)(1)(C) of this provision.
- (3) For avoidance of doubt, this cross-waiver includes a cross-waiver of liability arising from the Convention on International Liability for Damage Caused by Space Objects, (March 29, 1972, 24 United States Treaties and Other International Agreements (U.S.T.) 2389, Treaties and other International Acts Series (T.I.A.S.) No. 7762) in which the person, entity, or property causing the damage is involved in Protected Space Operations.
- (4) Notwithstanding the other provisions of this provision, this cross-waiver of liability shall not be applicable to:
 - (A) Claims between the United States and its related entities or claims between the related entities of any Partner State (e.g., claims between the Government and the Contractor are included within this exception);
 - (B) Claims made by a natural person, his/her estate, survivors, or subrogees for injury or death of such natural person;
 - (C) Claims for damage caused by willful misconduct; and
 - (D) Intellectual property claims.
- (5) Nothing in this section shall be construed to create the basis for a claim or suit where none would otherwise exist.

DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS [CT, FPNR&D, FPR&D, T&MC, LH-T&M, FPC, CREI, A-E-4/99] [FAR 52.211-15 – 9/90]

Incorporate by reference FAR 52.211-15, Defense Priority and Allocation Requirements.

DEFINITIONS [CT, FPNR&D, FPR&D, T&MC, LH-T&M, FPC, A-E-4/99] [FAR 52.202-1 – 10/95]

As used throughout this Contract, the following terms shall have the meanings set forth below:

- (a) The term "Administrator" means the Administrator or Deputy Administrator of the National Aeronautics and Space Administration.
- (b) The term "commercial component" means any component that is a commercial item.
- (c) The term "commercial item" means (see related term "nondevelopmental item," below):
 - (1) Any item, other than real property, that is of a type customarily used for nongovernmental purposes and that:
 - (A) Has been sold, leased, or licensed to the general public; or
 - (B) Has been offered for sale, lease, or license to the general public;
 - (2) Any item that evolved from an item described in paragraph (c)(1) of this Article through advances in technology or performance and that is not yet available in the commercial marketplace, but will be available in the commercial marketplace in time to satisfy the delivery requirements under a solicitation;
 - (3) Any item that would satisfy a criterion expressed in paragraphs (c)(1) or (2) of this Article, but for:
 - (A) Modifications of a type customarily available in the commercial marketplace; or
 - (B) Minor modifications of a type not customarily available in the commercial marketplace made to meet JPL or Federal Government requirements. "Minor" modifications means modifications that do not significantly alter the nongovernmental function or essential physical characteristics of an item or component, or change the purpose of a process. Factors to be considered in determining whether a modification is minor include the value and size of the modification and the comparative value and size of the final product. Dollar values and percentages may be used as guideposts, but are not conclusive evidence that a modification is minor;
 - (4) Any combination of items meeting the requirements of paragraphs (c)(1), (2), (3), or (5) of this Article that are of a type customarily combined and sold in combination to the general public;
 - (5) Installation services, maintenance services, repair services, training services, and other services if such services are procured for support of an item referred to in paragraphs (c)(1), (2), (3), or (4) of this Article, and if the source of such services:

- (A) Offers such services to the general public and the Federal Government contemporaneously and under similar terms and conditions; and
- (B) Offers to use the same work force for providing the Federal Government with such services as the source uses for providing such services to the general public;
- (6) Services of a type offered and sold competitively in substantial quantities in the commercial marketplace based on established catalog or market prices for specific tasks performed under standard commercial terms and conditions. This does not include services that are sold based on hourly rates without an established catalog or market price for a specific service performed;
- (7) Any item, combination of items, or service referred to in subparagraphs (c)(1) through (6), notwithstanding the fact that the item, combination of items, or service is transferred between or among separate divisions, subsidiaries, or affiliates of a Contractor; or
- (8) A nondevelopmental item, if the procuring activity determines the item was developed exclusively at private expense and sold in substantial quantities, on a competitive basis, to multiple State and local Governments (see definition below).
- (d) The term "component" means any item supplied as part of an end item or of another component.
- (e) The term "contract amount" means the Contract price, the estimated cost and fee, if any, or the ceiling price of the Contract.
- (f) The term "Contracting Officer" means the Government Contracting Officer for the Prime Contract. The term includes certain authorized representatives of the Contracting Officer acting within the limits of their authority as delegated by the Contracting Officer.
- (g) The term "Contractor" means the selling party to this Contract/Order with the California Institute of Technology (the Institute)/JPL being the buying party. The "Contractor" is the first tier subcontractor under the NASA Prime Contract between NASA and the Institute/JPL.
- (h) (1) The term "FAR" means the Federal Acquisition Regulation as in effect on the date of this Contract, unless otherwise indicated.
- (2) Any reference to the Contract Disputes Act is meant to refer to the Disputes provision in this Contract if any.
- (i) The term "Government" means the Government of the United States of America, unless the context is otherwise.
- (j) The term "Government-furnished property (GFP)" includes JPL-furnished, Government-owned property.
- (k) The term "Institute" means the California Institute of Technology as a party to this Contract.
- (l) The term "JPL" means the Jet Propulsion Laboratory as the organizational element of the Institute having responsibility for administration of this Contract. The rights of JPL under this Contract are the rights of the California Institute of Technology as a party to this Contract.
- (m) The term "JPL negotiator" means the individual authorized to issue and administer this Contract for JPL.
- (n) The term "NASA" means the National Aeronautics and Space Administration.
- (o) The term "NFS" means the NASA FAR Supplement as in effect on the date of this Contract, unless otherwise indicated.
- (p) The term "nondevelopmental item" means:
 - (1) Any previously developed item of supply used exclusively for governmental purposes by a Federal agency, a State or local government, or a foreign government with which the United States has a mutual defense cooperation agreement;
 - (2) Any item described in paragraph (p)(1) of this definition that requires only minor modification or modifications of a type customarily available in the commercial marketplace in order to meet the requirements of the procuring activity; or
 - (3) Any item of supply being produced that does not meet the requirements of paragraph (p)(1) or (2) solely because the item is not yet in use.
- (q) The term "person" means any individual, partnership, corporation, association, institution or other entity.

- (r) The term "Prime Contract" means the Contract between the Institute and NASA for the United States of America (herein called the Government),.
- (s) The term "Schedule" means the statements in the order/contract, including statement of work, description of items to be supplied, delivery dates, special provisions, options and any other statements excluding the General Provisions (the term "General Provisions" includes any "Additional General Provisions"), and any proposals, specifications or other documents or provisions which are made a part of this Contract by reference or otherwise.
- (t) The term "subcontract," as used in this Contract, includes, but is not limited to, purchase orders under this Contract.
- (u) The terms "United States" or "U.S." mean the United States of America.

DISPUTES [CT - 4/00]

- (a) Any dispute arising under or relating to this Contract which is not settled by agreement of the parties or pursuant to paragraph (b) below may be settled by appropriate legal proceedings. Pending any binding or conclusive decision, appeal or judgment referred to in this Article or the settlement of any such dispute, the Contractor shall proceed diligently with the performance of this Contract.
- (b) Notwithstanding any provisions herein to the contrary:
 - (1) If a decision on any question of fact arising under the Prime Contract is made by the Contracting Officer and such question of fact is also related to this Contract, said decision, if binding upon the Institute under the Prime Contract, shall in turn be binding upon the Institute and the Contractor with respect to such question insofar as it relates to this Contract; provided, however, that if the Contractor is adversely affected by any such decision made by the Contracting Officer, and if the Institute elects not to appeal such decision pursuant to the "Disputes" clause of the Prime Contract, the Institute shall notify the Contractor within 10 days after receipt by the Institute of a copy of the decision. Notification of the Contractor shall be deemed to have been made upon deposit by the Institute of a notice in the mail properly addressed to the Contractor or upon actual delivery of the Notice to Contractor by the Institute. The Contractor shall thereupon have the right reserved to the Institute under the Prime Contract to prosecute an appeal, in the name of the Institute, to the Administrator within 30 days after receipt by the Institute of a copy of the Contracting Officer's decision. Any decision upon appeal either by the Institute or by the Contractor in the Institute's name, if binding upon the Institute under the Prime Contract, shall in turn be binding upon the Contractor and the Institute with respect to such question of fact insofar as it relates to this Contract. The Institute is not required under the provisions of this Article to certify or submit, or permit the Contractor to do so in the Institute's name, such claims to the Government as the Institute does not believe the Government is liable for under the provisions of the Prime Contract and the Contract Disputes Act of 1978.
 - (2) If a decision is made by any representative of the Government on any question of fact and/or law arising under the Prime Contract which is also related to this Contract, from which an appeal under the "Disputes" clause in the Prime Contract is not available, said decision, if binding upon the Institute under the Prime Contract, shall in turn be binding upon the Contractor and the Institute with respect to such question insofar as it relates to this Contract; provided, however, that if the Contractor is adversely affected by any such decision, or if the Contractor is adversely affected by any decision upon an appeal referred to in paragraph (1) above, and if the Institute elects not to bring suit against the Government with respect to such decision, the Institute shall notify the Contractor with reasonable promptness. The Contractor shall thereupon have any right which the Institute would have to prosecute a suit against the Government in the Institute's name. Failure to exercise such right shall preclude the Contractor from objecting to the adverse conclusion or result under this Contract. A final judgment in any such suit shall be conclusive upon the Contractor and the Institute under this Contract. The Institute is not required under the provisions of this Article to certify or submit, or permit the Contractor to do so in the Institute's name, such claims to the Government as the Institute does not believe the Government is liable for under the provisions of the Prime Contract and the Contract Disputes Act of 1978.
 - (3) All costs and expenses of any such appeal or suit prosecuted by the Contractor shall be paid by the Contractor, without prejudice to any right the Contractor may otherwise have to recovery or allowance thereof.
 - (4) If as a result of any decision or judgment which is binding upon the Contractor and the Institute, as provided above, the Institute is unable to obtain reimbursement from the Government under the Prime Contract for, or is required to refund or credit to the Government, any amount with respect to any item of cost or fee for

which the Institute has reimbursed the Contractor, the Contractor shall, on demand, promptly repay such amount to the Institute. Additionally, pending the final conclusion of any appeal and/or suit hereunder, the Institute may demand, and upon such demand the Contractor shall pay over to the Institute, any amount which the Government has disallowed or suspended under the Prime Contract and which arises out of this Contract.

DRUG-FREE WORKPLACE REQUIREMENTS [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, FPC, CREI, A-E – 4/99]
[FAR 52.223-6 – 1/97]

The Contractor agrees to inform all Contractor personnel, prior to their first entrance upon JPL premises, that JPL's policy is to fully comply with the requirements of the Drug-Free Workplace Act and that Contractor personnel are required to comply with JPL's policy of maintaining a drug-free workplace.

ELECTRICAL EQUIPMENT ACQUISITION [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, FPC, CREI – 4/99]

(This Article is applicable if the Contract involves acquisition of off-the-shelf electrical equipment for delivery to or use by JPL or its designees.)

The electrical equipment being provided by the Contractor under this Contract shall be listed by Underwriters Laboratory, Factory Mutual Insurance Association, Canadian Standards Association, or similar organization of recognized standing. In the event that the equipment does not carry an appropriate approval, the individual components making up the item must be listed. Proof of listing shall be provided with delivery of the equipment in the form of accompanying data or labels. Any item not conforming to these requirements may be returned to the Contractor at the Contractor's expense. The Contractor agrees to require subcontractors, if any, which supply electrical equipment for delivery to or use by JPL or its designees to comply with this Article.

EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.222-37 – 1/88]

(This Article is applicable if this Contract (and any subcontract) is for \$10,000 or more, unless exempted by rules, regulations, or orders of the Secretary of Labor.)

Incorporate by reference FAR 52.222-37, Employment Reports on Special Disabled Veterans and Veterans of the Vietnam Era.

ENVIRONMENTAL COMPLIANCE [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99] [FAR 52.223-11 – 6/96; 52.223-12 – 5/95]

(This Article is applicable to all contracts to be performed at least partially within the United States, its possessions, and Puerto Rico.)

- (a) **Environmental Compliance**. Environmental controls shall be in accordance with all applicable Federal, State and local regulatory requirements and in accordance with all applicable Executive Orders of the President. In addition the contractor shall comply with the provisions set forth below.
- (b) The Contractor shall comply with the applicable requirements of Sections 608 and 609 of the Clean Air Act (42 U.S.C. 7671g and 7671h) as each or both apply to this contract:
- (c) (1) **Definition**. "Ozone-depleting substance", as used in this clause, means any substance designated as Class I by the Environmental Protection Agency (EPA) (40 CFR Part 82), including but not limited to chlorofluorocarbons, halons, carbon tetrachloride, and methyl chloroform; or any substance designated as Class II by EPA (40 CFR Part 82), including but not limited to hydrochlorofluorocarbons.
- (2) The Contractor shall label products which contain or are manufactured with ozone-depleting substances in the manner and to the extent required by 42 U.S.C. 7671j (b), (c), and (d) and 40 CFR Part 82, Subpart E, as follows:

WARNING

Contains (or manufactured with, if applicable) (*)_____, a substance(s) which harm(s) public health and environment by destroying ozone in the upper atmosphere.

(* The Contractor shall insert the name of the substance(s))

EQUAL OPPORTUNITY [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, FPC, CREI, A-E – 8/01] [FAR 52.222-26 – 4/84]

(The following Article is applicable unless this Contract is exempt under the rules, regulations, and relevant orders of the Secretary of Labor issued under Executive Order 11246, as amended; for example, work performed outside the

United States by employees recruited outside the United States is exempt from the requirements of this Article. If, during any 12-month period [including the 12 months preceding the award of this Contract], the Contractor has been or is awarded nonexempt Federal contracts and/or subcontracts that have an aggregate value in excess of \$10,000, the Contractor shall comply with FAR 52.222-26 during performance of this Contract. Upon request, the Contractor shall provide information necessary to determine the applicability of this Article.)

Incorporate by reference FAR 52.222-26, Equal Opportunity (E.O. 11246).

EQUIPMENT (EXCLUDING VEHICLES), TOOLS AND MATERIAL (CONTRACTOR PERSONNEL IN RESIDENCE AT JPL) [CT, LH-T&M, T&MC – 4/99]

(This Article applies if the Contract work will be performed at a JPL-controlled facility, and tools, equipment, or materials will be issued to the Contractor's personnel by JPL.)

- (a) Contractor personnel will not bring work Items, i.e., tools, equipment (for example, personal computers and printers), or material, upon the premises while working at a JPL-controlled facility. JPL will provide those Items necessary for performance of work at a JPL-controlled facility, and such Items shall not be removed from the premises unless removal from JPL premises is specifically authorized by the JPL Supply and Equipment Section Manager or designated representative. Items so provided shall not be considered "Government-Furnished Property," and will not be subject to the "Government Property" Article of this Contract, but will be issued to individual Contractor personnel. Contractor personnel will be held to the same standards of conduct regarding such Items as JPL employees, that is:
 - (1) Contractor personnel shall promptly notify their supervisor or the Cognizant JPL Technical Representative of any loss, damage, or destruction of Items issued to them.
 - (2) The Contractor will be held liable for any loss, damage, or destruction of such Items resulting from gross negligence, willful misconduct, unlawful appropriation by its personnel for personal use or benefit, or use for other than JPL business on the part of its personnel.
- (b) The Contractor agrees to inform its personnel who may work at a JPL-controlled facility of this procedure and of their responsibilities. JPL will advise the Contractor promptly upon determining that any Contractor personnel has failed to return or satisfactorily account for any Item issued to such personnel. The Contractor agrees that JPL may withhold from any monies due or to become due the Contractor under this Contract, or to otherwise reimburse JPL, the value of any Items issued to Contractor personnel and neither returned nor satisfactorily accounted for upon completion of work under this Contract or when so requested by JPL.

EXCUSABLE DELAYS [CT, LH-T&M, T&MC – 4/99]

- (a) Except for defaults of subcontractors at any tier, the Contractor shall not be in default because of any failure to perform this Contract under its terms if the failure arises from causes beyond the control and without the fault or negligence of the Contractor. Examples of these are (i) acts of God or of the public enemy, (ii) acts of the Government in either its sovereign or contractual capacity, (iii) fires, (iv) floods, (v) epidemics, (vi) quarantine restrictions, (vii) strikes, (viii) freight embargoes, and (ix) unusually severe weather. In each instance, the failure to perform must be beyond the control and without the fault or negligence of the Contractor. "Default" includes failure to make progress in the work so as to endanger performance.
- (b) If the failure to perform is caused by the failure of a subcontractor at any tier to perform or make progress, and if the cause of the failure was beyond the control of both the Contractor and subcontractor, and without the fault or negligence of either, the Contractor shall not be deemed to be in default, unless:
 - (1) The subcontracted supplies or services were obtainable from other sources;
 - (2) JPL ordered the Contractor in writing to purchase these supplies or services from the other source; and
 - (3) The Contractor failed to comply reasonably with this order.
- (c) Upon request of the Contractor, JPL shall ascertain the facts and extent of the failure. If JPL determines that any failure to perform results from one or more of the causes above, the delivery schedule shall be revised, subject to the rights of the Institute under the "Termination" Article of this Contract.

EXISTING COMMERCIAL COMPUTER SOFTWARE – LICENSING [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, CREI – 4/99] [NFS 1852.227-86 – 12/87]

(This Article is applicable to the acquisition of any existing commercial computer software under this Contract.)

- (a) Any delivered commercial computer software (including documentation thereof) developed at private expense and claimed as proprietary shall be subject to the restricted rights in paragraph (d) below. Where the Vendor/Contractor proposes its standard commercial software license, only those applicable portions thereof which comply with the other provisions of this Contract, Federal laws, FAR and NFS, including the restricted rights in paragraph (d) below, are incorporated into and made a part of this Purchase Order/Contract.
- (b) Although the Vendor/Contractor might not propose its standard commercial software license until after this Purchase Order/Contract has been issued, or at or after the time the computer software is delivered, such license shall nevertheless be deemed incorporated into and made a part of this Purchase Order/Contract under the same terms and conditions as in paragraph (a) above. For purposes of receiving updates, correction notices, consultation, and similar activities on the computer software, any authorized user may acknowledge receipt of a registration form or card and return it directly to the Vendor/Contractor; however, such signing shall not add to or alter any of the terms and conditions of this Article or the Purchase Order/Contract into which this Article is incorporated.
- (c) The Vendor's/Contractor's acceptance is expressly limited to the terms and conditions of this Purchase Order/Contract. If the specified computer software is shipped or delivered to JPL or NASA, it shall be understood that the Vendor/Contractor has unconditionally accepted the terms and conditions set forth in this Article, and that the terms and conditions of this Purchase Order/Contract (including the incorporated license) constitute the entire agreement between the parties concerning rights in the computer software.
- (d) The following restricted rights shall apply:
 - (1) The commercial computer software may not be used, reproduced, or disclosed by the Institute or the Government except as provided below or otherwise expressly stated in the Purchase Order/Contract.
 - (2) The commercial computer software may be:
 - (A) Used, or copied for use, in or with any computer owned or leased by, or on behalf of, the Government, or the Institute in support and furtherance of its Government contract obligations; provided, the software is not used, nor copied for use, in or with more than one computer simultaneously, unless otherwise permitted by the license incorporated under paragraphs (a) or (b) above;
 - (B) Reproduced for safekeeping (archives) or backup purposes;
 - (C) Modified, adapted, or combined with other computer software, provided that the modified, combined, or adapted portions of the derivative software incorporating restricted computer software shall be subject to the same restricted rights; and
 - (D) Disclosed and reproduced for use by Government or Institute contractors or their subcontractors in accordance with the restricted rights in subdivisions (A), (B), and (C) above; provided they have the Government's or the Institute's permission to use the computer software and have also agreed to protect the computer software from unauthorized use and disclosure.
 - (3) If the incorporated Vendor's/Contractor's software license contains provisions or rights that are less restrictive than the restricted rights in subparagraph (d)(2) above, then the less restrictive provisions or rights shall prevail.
 - (4) If the computer software is published, copyrighted computer software, it is licensed to the Government, and in support and furtherance of its Government contract obligations, the Institute, without disclosure prohibitions, with the rights in subparagraphs (d)(2) and (3) above.
 - (5) The computer software may be marked with any appropriate proprietary notice that is consistent with the rights in subparagraphs (d)(2), (3), and (4) above.
- (e) The Contractor warrants that it has the right to sell, license, or transfer the license for the software furnished to the customer under this Contract in accordance with the terms of this Contract.

FACSIMILE COPIES ACCEPTABLE [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, FPC, CREI, A-E – 4/99]

The parties agree that facsimile (fax) copies of contract documents are just as binding as originally executed documents.

FELONY CONVICTION INFORMATION (CONTRACTOR PERSONNEL IN RESIDENCE AT JPL) [CT, LH-T&M, T&MC – 4/99]

(This Article applies to contracts/subcontracts when contractor- and/or subcontractor-furnished personnel will be performing work in residence at JPL- controlled facilities.)

When access to JPL facilities is required by Contractor personnel, the Contractor shall provide JPL-requested personnel access information, including an Affiliate Access Request (form JPL 1943), attached hereto, executed by the Contractor and the person requiring access. This request shall be provided to the JPL Plant Protection Office at least 24 hours prior to the time access is required to JPL premises. JPL reserves the right to approve or deny access to its facilities, based on the response given on form JPL 1943 or on other information available to JPL.

GEOGRAPHIC PARTICIPATION IN THE AEROSPACE PROGRAM [CT, FP-NR&D, FPR&D, T&MC, LH-T&M, CREI – 2/00] [NFS 1852.244-70 – 4/85]

(This Article is applicable to contracts and subcontracts of \$100,000 or more. Work performed outside the United States is exempt from the requirements of this Article.)

Incorporate by reference NFS 1852.244-70, Geographic Participation in the Aerospace Program.

GOVERNMENT PROPERTY [CT – 4/99] [FAR 52.245-5 – 1/86]

(a) Government-Owned/JPL-Furnished Property (hereafter "GFP").

- (1) The term "Contractor's managerial personnel," as used in paragraph (g) of this Article, means any of the Contractor's directors, officers, managers, superintendents, or equivalent representatives who have supervision or direction of:
 - (A) All or substantially all of the Contractor's business;
 - (B) All or substantially all of the Contractor's operation at any one plant, or separate location at which the Contract is being performed; or
 - (C) A separate and complete major industrial operation connected with performing this Contract.
- (2) JPL shall deliver to the Contractor, for use in connection with and under the terms of this Contract, the property, if any, which JPL has committed to provide in the Schedule or specifications, together with such related data and information as the Contractor may request and as may be reasonably required for the intended use of the property.
- (3) The delivery or performance dates for this Contract are based upon the expectation that GFP suitable for use will be delivered to the Contractor at the times stated in the Schedule or, if not so stated, in sufficient time to enable the Contractor to meet the Contract's delivery or performance dates.
- (4) If GFP is received by the Contractor in a condition not suitable for the intended use, the Contractor shall, upon receipt, notify JPL, detailing the facts, and, as directed by JPL and at JPL expense, either effect repairs or modification or return or otherwise dispose of the property. After completing the directed action and upon written request of the Contractor, JPL shall make an equitable adjustment as provided in paragraph (h) of this Article.
- (5) If GFP is not delivered to the Contractor by the required time or times, JPL shall, upon the Contractor's timely written request, make a determination of the delay, if any, caused the Contractor and shall make an equitable adjustment in accordance with paragraph (h) of this Article.

(b) Changes in GFP.

- (1) JPL may, by written notice, (i) decrease GFP provided or to be provided under this Contract or (ii) substitute other GFP for the property to be provided by JPL or to be acquired by the Contractor for JPL under this Contract. The Contractor shall promptly take such action as JPL may direct regarding the removal, shipment, or disposal of the property covered by this notice.
- (2) Upon the Contractor's written request, JPL shall make an equitable adjustment to the Contract in accordance with paragraph (h) of this Article, if JPL has agreed in the Schedule to make such property available for performing this Contract and there is any:
 - (A) Decrease or substitution in this property pursuant to subparagraph (b)(1) above; or
 - (B) Withdrawal of authority to use property, if provided under any other contract or lease.

(c) Title.

- (1) Title to all property furnished by JPL shall remain in the Government.
- (2) Title to all property purchased by the Contractor for which the Contractor is entitled to be reimbursed as a direct item of cost under this Contract shall pass to and vest in the Government upon the vendor's delivery of such property.
- (3) Title to all other property, the cost of which is reimbursable to the Contractor, shall pass to and vest in the Government upon:
 - (A) Issuance of the property for use in Contract performance;
 - (B) Commencement of processing of the property or use in Contract performance; or
 - (C) Reimbursement of the cost of the property by the Institute;whichever occurs first.
- (4) All GFP and all property acquired by the Contractor, title to which vests in the Government under this paragraph (collectively referred to as "Government property"), are subject to the provisions of this Article. Title to Government property shall not be affected by its incorporation into or attachment to any property not owned by the Government, nor shall Government property become a fixture or lose its identity as personal property by being attached to any real property.

(d) Use of Government Property. The Government property shall be used only for performing this Contract, unless otherwise provided in this Contract or approved by JPL.

(e) Property Administration.

- (1) The Contractor shall be responsible and accountable for all Government property provided under this Contract and shall comply with the applicable provisions of FAR 45.5, and any corresponding implementing or supplementing provisions in the NFS, as modified by the JPL document "Management of Government Property in the Possession of Contractors" (JPL 0968), a copy of which is attached to and made a part of this Contract.
- (2) The Contractor shall establish and maintain a program for the use, maintenance, repair, protection, and preservation of Government property in accordance with sound business practice and the applicable provisions of FAR 45.5 and any corresponding implementing or supplementing provisions in the NFS, as modified by JPL 0968.
- (3) If damage occurs to Government property, the risk of which has been assumed by JPL under this Contract, JPL shall replace the items or the Contractor shall make such repairs as JPL directs. However, if the Contractor cannot effect such repairs within the time required, the Contractor shall dispose of the property as directed by JPL. When any property for which JPL is responsible is replaced or repaired, JPL shall make an equitable adjustment in accordance with paragraph (h) of this Article.

(f) Access. JPL or the Government and all its designees shall have access at all reasonable times to the premises in which any Government property is located for the purpose of inspecting the Government property.

(g) Limited Risk of Loss.

- (1) The Contractor shall not be liable for loss or destruction of, or damage to, the Government property provided under this Contract or for expenses incidental to such loss, destruction, or damage, except as provided in subparagraphs (2) and (3) below.
- (2) The Contractor shall be responsible for loss or destruction of, or damage to, the Government property provided under this Contract (including expenses incidental to such loss, destruction, or damage):
 - (A) That results from a risk expressly required to be insured under this Contract, but only to the extent of the insurance required to be purchased and maintained or to the extent of insurance actually purchased and maintained, whichever is greater;
 - (B) That results from a risk that is in fact covered by insurance or for which the Contractor is otherwise reimbursed, but only to the extent of such insurance or reimbursement;
 - (C) For which the Contractor is otherwise responsible under the express terms of this Contract;

- (D) That results from willful misconduct or lack of good faith on the part of the Contractor's managerial personnel; or
 - (E) That results from a failure on the part of the Contractor, due to willful misconduct or lack of good faith on the part of the Contractor's managerial personnel, to establish and administer a program or system for the control, use, protection, preservation, maintenance, and repair of Government property as required by paragraph (e) of this Article.
- (3) (A) If the Contractor fails to act as provided by subparagraph (g)(2)(E) above, after being notified (by certified mail addressed to one of the Contractor's managerial personnel) of the Government's disapproval, withdrawal of approval, or nonacceptance of the system or program, it shall be conclusively presumed that such failure was due to willful misconduct or lack of good faith on the part of the Contractor's managerial personnel.
- (B) In such event, any loss or destruction of, or damage to, the Government property shall be presumed to have resulted from such failure unless the Contractor can establish by clear and convincing evidence that such loss, destruction, or damage:
- (i) Did not result from the Contractor's failure to maintain an approved program or system; or
 - (ii) Occurred while an approved program or system was maintained by the Contractor.
- (4) If the Contractor transfers Government property to the possession and control of a subcontractor, the transfer shall not affect the liability of the Contractor for loss or destruction of, or damage to, the property as set forth above. However, the Contractor shall require the subcontractor to assume the risk of, and be responsible for, any loss or destruction of, or damage to, the property while in the subcontractor's possession or control, except to the extent that the subcontract, with the advance approval of JPL, relieves the subcontractor from such liability. In the absence of such approval, the subcontract shall contain appropriate provisions requiring the return of all Government property in as good condition as when received, except for reasonable wear and tear or for its use in accordance with the provisions of the Contract.
- (5) Upon loss or destruction of, or damage to, Government property provided under this Contract, the Contractor shall so notify JPL and shall communicate with the loss and salvage organization, if any, designated by JPL. With the assistance of any such organization, the Contractor shall take all reasonable action to protect the Government property from further damage, separate the damaged and undamaged Government property, put all the affected Government property in the best possible order, and furnish to JPL a statement of:
- (A) The lost, destroyed, or damaged Government property;
 - (B) The time and origin of the loss, destruction, or damage;
 - (C) All known interests in commingled property of which the Government property is a part; and
 - (D) The insurance, if any, covering any part of or interest in such commingled property.
- (6) The Contractor shall repair, renovate, and take such other action with respect to damaged Government property as JPL directs. If the Government property is destroyed or damaged beyond practical repair, or is damaged and so commingled or combined with property of others (including the Contractor's) that separation is impractical, the Contractor may, with the approval of and subject to any conditions imposed by JPL, sell such property for the account of this Contract. Such sales may be made in order to minimize the loss to the Government, to permit the resumption of business, or to accomplish a similar purpose. The Contractor shall be entitled to an equitable adjustment in the Contract amount for the expenditures made in performing the obligations under this subparagraph (g)(6) in accordance with paragraph (h) of this Article. However, the Government may directly reimburse the loss and salvage organization for any of their charges. JPL shall give due regard to the Contractor's liability under this paragraph (g) when making any such equitable adjustment.
- (7) The Contractor shall not be reimbursed for, and shall not include as an item of overhead, the cost of insurance or of any reserve covering risk of loss or destruction of, or damage to, Government property, except to the extent that the Institute may have expressly required the Contractor to carry such insurance under another provision of this Contract.
- (8) In the event the Contractor is reimbursed or otherwise compensated for any loss or destruction of, or damage to, Government property, the Contractor shall use the proceeds to repair, renovate, or replace the

lost, destroyed, or damaged Government property or shall otherwise credit the proceeds to, or equitably reimburse, the Institute or the Government, as directed by JPL.

- (9) The Contractor shall do nothing to prejudice the Institute's or the Government's rights to recover against third parties for any loss or destruction of, or damage to, Government property. Upon the request of JPL, the Contractor shall, at the Government's expense, furnish to the Government all reasonable assistance and cooperation (including the prosecution of suit and the execution of instruments of assignment in favor of the Government) in obtaining recovery. In addition, where a subcontractor has not been relieved from liability for any loss or destruction of, or damage to, Government property, the Contractor shall enforce for the benefit of the Government the liability of the subcontractor for such loss, destruction, or damage.
- (h) Equitable Adjustment. When this Article specifies an equitable adjustment, it shall be made to any affected Contract provision in accordance with the procedures of the "Changes" Article. When appropriate, JPL may initiate an equitable adjustment in favor of JPL. The right to an equitable adjustment shall be the Contractor's exclusive remedy. JPL shall not be liable to suit for breach of Contract for:
- (1) Any delay in delivery of GFP;
 - (2) Delivery of GFP in a condition not suitable for its intended use;
 - (3) A decrease in or substitution of GFP; or
 - (4) Failure to repair or replace Government property for which JPL is responsible.
- (i) Final Accounting and Disposition of Government Property. Upon completing this Contract, or at such earlier dates as may be fixed by JPL, the Contractor shall submit, in a form acceptable to JPL, inventory schedules covering all items of Government property not consumed in performing this Contract or delivered to JPL. The Contractor shall prepare for shipment, deliver, or dispose of the Government property as may be directed or authorized by JPL. The net proceeds of any such disposal shall be credited to the cost of the work covered by this Contract or paid in such manner as directed by JPL. The foregoing provisions shall apply to scrap from Government property; provided, however, that JPL may authorize or direct the Contractor to omit from such inventory schedules any scrap consisting of faulty castings or forgings or of cutting and processing waste, such as chips, cuttings, borings, turnings, short ends, circles, trimmings, clippings, and remnants, and to dispose of such scrap in accordance with the Contractor's normal practice and account for it as a part of general overhead or other reimbursable costs in accordance with the Contractor's established accounting procedures.
- (j) Abandonment and Restoration of Contractor Premises. Unless otherwise provided herein, the Government through JPL:
- (1) May abandon any Government property in place, at which time all obligations of the Government and of the Institute regarding such abandoned property shall cease; and
 - (2) Has no obligation to restore or rehabilitate the Contractor's premises under any circumstances (e.g., abandonment, disposition upon completion of need, or Contract completion). However, if the GFP (listed in the Schedule or specifications) is withdrawn or is unsuitable for the intended use, or if other Government property is substituted, then the equitable adjustment under paragraph (h) of this Article may properly include restoration or rehabilitation costs.
- (k) Communications. All communications under this Article shall be in writing.
- (l) Overseas Contracts. If this Contract is to be performed outside the United States of America, its territories, or possessions, the words "Government" and "Government-furnished" (when they appear in this Article) shall be construed as "United States Government" and "United States Government-furnished," respectively.

HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH-T&M, FPC, CREI – 4/99] [FAR 52.223-3 – 1/97, Alt. I – 7/95]

(This Article applies if any materials are to be supplied which are defined as hazardous under the latest version of Federal Standard No. 313 [including revisions adopted during the term of the Contract].

Incorporate FAR 52.223-3 [Jan 97, Alt. I, Jul 95] with JPL negotiator in lieu of Contracting Officer and adding JPL with the Government in all respects including safety and rights to data.)

INJURY AND ILLNESS PREVENTION PROGRAM [CT, FP-NR&D, FP-R&D, T&MC, LH-T&M, FPC, CREI, A-E – 4/99]

All Contractors whose personnel work at a site in California must establish and implement an effective injury and illness prevention program in compliance with California law.

INSPECTION OF RESEARCH AND DEVELOPMENT [CT – 4/99] [FAR 52.246-3 – 4/84; 52.246-9 – 4/84]

(a) Definitions.

- (1) "Contractor's managerial personnel," as used in this Article, means the Contractor's directors, officers, managers, superintendents, or equivalent representatives who have supervision or direction of:
 - (A) All or substantially all of the Contractor's business;
 - (B) All or substantially all of the Contractor's operation at any one plant or separate location at which the Contract is being performed; or
 - (C) A separate and complete major industrial operation connected with performing this Contract.
 - (2) "Work," as used in this Article, includes data when the contract does not include the Warranty of Data Article.
- (b) The Contractor shall provide and maintain an inspection system acceptable to JPL covering the work under this Contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to JPL during Contract performance and for as long afterwards as the Contract requires.
- (c) JPL through any authorized representatives has the right to inspect and test all work called for by the Contract, to the extent practicable at all places and times, including the period of performance, and in any event before acceptance. JPL may also inspect the plant or plants of the Contractor or its subcontractors engaged in the Contract performance. JPL shall perform inspections and tests in a manner that will not unduly delay the work.
- (d) If JPL performs any inspection or test on the premises of the Contractor or a subcontractor, the Contractor shall furnish and shall require subcontractors to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.
- (e) Unless otherwise provided in the Contract, JPL shall accept work as promptly as practicable after delivery, and work shall be deemed accepted 90 days after delivery, unless accepted earlier.
- (f) At any time during performance, but no later than six months (or such other time as may be specified in the Schedule) after final acceptance of all of the end items (other than designs, drawings, or reports) to be delivered under the Contract, JPL may require the Contractor to replace or correct work not meeting Contract requirements. Time devoted to the replacement or correction of such work shall not be included in the computation of the above time period. Except as otherwise provided in paragraph (h) below, the cost of replacement or correction shall be determined as specified in the Article of this Contract entitled "Allowable Cost and Payment," but no additional fee shall be paid. The Contractor shall not tender for acceptance work required to be replaced or corrected without disclosing the former requirement for replacement or correction, and, when required, shall disclose the corrective action taken.
- (g) If the Contractor fails to proceed with reasonable promptness to perform required replacement or correction, JPL may:
- (1) By contract or otherwise, perform the replacement or correction, charge to the Contractor any increased cost incurred by the Institute, or make an equitable reduction in any fee paid or payable under the Contract;
 - (2) Require delivery of any undelivered articles and shall have the right to make an equitable reduction in any fee paid or payable under the Contract; or
 - (3) Terminate the Contract for default, as provided in the Article of this Contract entitled "Termination."
- (h) Notwithstanding paragraphs (f) and (g) above, JPL may at any time require the Contractor to remedy by correction or replacement, without cost to the Institute, any failure by the Contractor to comply with the requirements of this Contract, if the failure is due to (i) fraud, lack of good faith, or willful misconduct on the part of the Contractor's managerial personnel or (ii) the conduct of one or more of the Contractor's employees selected or retained by the Contractor after any of the Contractor's managerial personnel has reasonable grounds to believe that the employee is habitually careless or unqualified.
- (i) This Article shall apply in the same manner to a corrected or replacement end item or components as to work originally delivered.
- (j) The Contractor has no obligation or liability under the Contract to correct or replace articles not meeting Contract requirements at time of delivery, except as provided in this Article or as may otherwise be specified in the Contract.

- (k) Unless otherwise provided in the Contract, the Contractor's obligations to correct or replace Government-furnished property shall be governed by the Article pertaining to Government property.
- (l) If this Contract, including those documents forming a part hereof by reference or incorporation, provides for or requires the submission of any of the work to JPL for approval, any such approval given by JPL, prior to final acceptance, shall not relieve the Contractor of its responsibility for complying with the specifications and other provisions of this Contract. Any such approval shall not be construed as an assumption by JPL of the responsibility that such work complies or will comply with the specifications or other provisions of this Contract.
- (m) The Government has the right to inspect and evaluate the work performed or being performed under the Contract, and the premises where the work is being performed, at all reasonable times and in a manner that will not unduly delay the work. If the Government performs inspection or evaluation on the premises of the Contractor or a subcontractor, the Contractor shall furnish and shall require subcontractors to furnish all reasonable facilities and assistance for the safe and convenient performance of these duties.

INSURANCE - LIABILITY TO THIRD PERSONS [CT - 2/00] [FAR 52.228-7 - 4/84]

(Work performed outside the United States is exempt from the requirements of this Article.)

- (a) Except as provided in subparagraph (1) immediately following or in paragraph (h) of this Article (if this Article contains paragraph (h)), the Contractor shall provide and thereafter maintain the following insurance with respect to performance under this Contract:
 - (1) Workers' Compensation and Employer's Liability Insurance, as required by applicable Federal and state workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the Employer's Liability section of the insurance policy, except when Contract operations are so commingled with the Contractor's commercial operations that it would not be practical. The Employer's Liability coverage shall be at least \$100,000, except in states with exclusive or monopolistic funds that do not permit worker's compensation to be written by private carriers. However, the Contractor in fulfillment of its obligation to provide Workers' Compensation Insurance may maintain a self-insurance program if the Contractor is qualified pursuant to statutory authority to do so.
 - (2) Comprehensive Liability Insurance, including automobiles (owned, non-owned and leased), completed operations, products, and Contractual Liability Insurance specifically covering all liability assumed under this Contract. Such insurance shall be written for a combined single limit of not less than \$1,000,000 for all deaths, injuries and property damage arising from one accident or occurrence.
 - (3) Such other insurance as JPL may from time to time require.

The Contractor agrees to furnish certificates of insurance to JPL for the coverage required hereunder, should JPL so request.

- (b) The Contractor agrees to submit for approval of JPL, to the extent and in the manner required by JPL, any other insurance that is maintained by the Contractor in connection with the performance of this Contract and for which the Contractor seeks reimbursement.
- (c) Except as provided in paragraph (h) of this Article (if this Article contains paragraph (h)), the Contractor shall be reimbursed:
 - (1) For that portion (i) of the reasonable cost of insurance allocable to this Contract and (ii) required or approved under this Article; and
 - (2) For certain liabilities (and expenses incidental to such liabilities) to third persons not compensated by insurance or otherwise. These liabilities must arise out of the performance of this Contract, whether or not caused by the negligence of the Contractor or of the Contractor's agents, servants, or employees, and must be represented by final judgments or settlements approved in writing by the Institute. These liabilities are for (i) loss of or damage to property (other than property owned, occupied, or used by the Contractor, rented to the Contractor, or in the care, custody, or control of the Contractor); or (ii) death or bodily injury.
- (d) The Institute's liability under paragraph (c)(2) of this Article is subject to the availability of funds under the Prime Contract at the time a contingency occurs.
- (e) The Contractor shall not be reimbursed for liabilities (and expenses incidental to such liabilities):
 - (1) For which the Contractor is otherwise responsible under the express terms of any Article or Articles specified in the Schedule or elsewhere of the Contract;

- (2) For which the Contractor has failed to insure or to maintain insurance as required; or
- (3) That result from willful misconduct or lack of good faith on the part of any of the Contractor's directors, officers, managers, superintendents, or other representatives who have supervision or direction of:
 - (A) All or substantially all of the Contractor's business;
 - (B) All or substantially all of the Contractor's operations at any one plant or separate location in which this Contract is being performed; or
 - (C) A separate and complete major industrial operation in connection with the performance of this Contract.
- (f) The provisions of paragraph (e) of this Article shall not restrict the right of the Contractor to be reimbursed for the cost of insurance maintained by the Contractor in connection with the performance of this Contract, other than insurance required in accordance with this Article; provided, that such cost is allowable under the "Allowable Cost and Payment" Article of this Contract.
- (g) If any suit or action is filed or any claim is made against the Contractor, the cost and expense of which may be reimbursable to the Contractor under this Contract, and the risk of which is then uninsured or is insured for less than the amount claimed, the Contractor shall:
 - (1) Immediately notify JPL and promptly furnish copies of all pertinent papers received;
 - (2) Authorize Institute or Government representatives to collaborate with counsel for the insurance carrier in settling or defending the claim when the amount of the liability claimed exceeds the amount of coverage; and
 - (3) Authorize Institute or Government representatives to settle or defend the claim and to represent the Contractor in or to take charge of any litigation, if required by the Institute, when the liability is not insured or covered by bond. The Contractor may, at its own expense, be associated with the Institute or the Government representatives in any such claim or litigation.
- (h) (RESERVED)

INTEGRITY OF UNIT PRICES [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, CREI – 4/99] [FAR 52.215-14 – 10/97]

(This Article is applicable if the initial Contract price exceeds \$100,000, unless the Contract is for services where supplies are not required, construction or architect-engineer services, utility services, commercial items, or petroleum products.)

- (a) Any proposal submitted for the negotiation of prices for items of supplies shall distribute costs within contracts on a basis that ensures that unit prices are in proportion to the items' base cost (e.g., manufacturing or acquisition costs). Any method of distributing costs to line items that distorts unit prices shall not be used. For example, distributing costs equally among line items is not acceptable except when there is little or no variation in base cost. Nothing in this paragraph requires submission of cost or pricing data not otherwise required by law or regulation.
- (b) The Contractor shall insert the substance of this Article in all subcontracts meeting the applicability prescription above.

LIMITATION OF COST [CT – 4/99]

- (a) The parties estimate that the total cost for performance of this Contract, exclusive of any fee, will not cost the Institute more than (i) the estimated cost specified in the Schedule, or, (ii) if this is a cost-sharing contract, the Institute's share of the estimated cost specified in the Schedule. The Contractor agrees to use its best efforts to perform the work specified in the Schedule and all obligations under this Contract within the estimated cost, which, if this is a cost-sharing contract, includes both the Institute's and the Contractor's share of the cost.
- (b) The Contractor shall notify JPL in writing whenever it has reason to believe that:
 - (1) The costs the Contractor expects to incur under this Contract in the next 60 days, when added to all costs previously incurred, will exceed 75% of the estimated cost specified in the Schedule; or
 - (2) The total cost for the performance of this Contract, exclusive of any fee, will be either greater or substantially less than had been previously estimated.
- (c) As part of the notification, the Contractor shall provide JPL a revised estimate of the total cost of performing this Contract.

- (d) Except as required by other provisions of this Contract, specifically citing and stated to be an exception to this Article:
 - (1) The Institute is not obligated to reimburse the Contractor for costs incurred in excess of (i) the estimated cost specified in the Schedule or, (ii) if this is a cost-sharing Contract, the estimated cost to the Institute specified in the Schedule; and
 - (2) The Contractor is not obligated to continue performance under this Contract (including actions under the "Termination" Article of this Contract) or otherwise incur costs in excess of the estimated cost specified in the Schedule, until JPL (i) notifies the Contractor in writing that the estimated cost has been increased and (ii) provides a revised estimated total cost of performing this Contract. If this is a cost-sharing Contract, the increase shall be allocated in accordance with the formula specified in the Schedule.
- (e) No notice, communication, or representation in any form other than that specified in subparagraph (d)(2) above, or from any person other than a duly authorized representative of JPL shall affect the estimated cost of this Contract. In the absence of the specified notice, the Institute is not obligated to reimburse the Contractor for any costs in excess of the estimated cost, or if this is a cost-sharing Contract, for any costs in excess of the estimated cost to the Institute specified in the Schedule, whether those excess costs were incurred during the course of the Contract or as a result of termination.
- (f) If the estimated cost specified in the Schedule is increased, any costs the Contractor incurs before the increase that are in excess of the previously estimated cost shall be allowable to the same extent as if incurred afterward, unless JPL issues a termination or other notice directing that the increase is solely to cover termination or other specified expenses.
- (g) Directions, orders, notices, requests and the like issued by JPL pursuant to the "Changes" Article or any other provision of this Contract shall not be considered an authorization to exceed the estimated cost specified in the Schedule, in the absence of a statement in a Unilateral Modification or other Contract Modification increasing the estimated cost.

LIMITATION OF FUNDS [CT – 4/99]

(This Article shall be applicable and the Article of this Contract entitled "Limitation of Cost" inapplicable until such time as an amount equal to the total estimated cost and fee set forth in the Schedule is allotted to this Contract and thereafter the Article of this Contract entitled "Limitation of Cost" shall be applicable and this Article inapplicable, unless and until the amount allotted to this Contract once again becomes less than the total estimated cost and fee set forth in the Schedule.)

- (a) The parties estimate that performance of this Contract will not cost the Institute more than (i) the estimated cost specified in the Schedule or, (ii) if this is a cost-sharing contract, the Institute's share of the estimated cost specified in the Schedule. The Contractor agrees to use its best efforts to perform the work specified in the Schedule and all obligations under this Contract within the estimated cost, which, if this is a cost-sharing contract, includes both the Institute's and the Contractor's share of the cost.
- (b) The Schedule specifies the amount presently available for payment by the Institute and allotted to this Contract, or the Institute's share of the cost if this is a cost-sharing contract. The parties contemplate that the Institute will allot additional funds incrementally to the Contract up to the full estimated cost to the Institute specified in the Schedule, exclusive of any fee. The Contractor agrees to perform, or have performed, work on the Contract up to the point at which the total amount paid and payable by the Institute under the Contract approximates but does not exceed the total amount actually allotted by the Institute to the Contract.
- (c) The Contractor shall notify JPL in writing whenever it has reason to believe that the costs which it expects to incur in the performance of this Contract in the next succeeding 60 days, when added to (i) all costs previously incurred; (ii) the amount of termination costs that would be payable by the Institute in the event of termination of this Contract for the convenience of the Institute; and (iii) any fee paid or payable up through such period; will either (i) exceed the total amount so far allotted to the Contract by the Institute or, (ii) if this is a cost-sharing contract, the amount then allotted to the Contract by the Institute plus the Contractor's corresponding share.
- (d) If, after notification, additional funds are not allotted in sufficient time to enable the Contractor to continue performance of this Contract in a timely manner, the Institute will, upon written request by the Contractor, terminate this Contract pursuant to the provisions of the "Termination" Article.
- (e) Except as required by other provisions of this Contract, specifically citing and stated to be an exception to this Article:

- (1) The Institute is not obligated to reimburse the Contractor for costs incurred in excess of the total amount allotted by the Institute to this Contract; and
 - (2) The Contractor is not obligated to continue performance under this Contract (including actions under the "Termination" Article of this Contract) or otherwise incur costs in excess of (i) the amount then allotted to the Contract by the Institute or, (ii) if this is a cost-sharing contract, the amount then allotted by the Institute to the Contract plus the Contractor's corresponding share, until JPL notifies the Contractor in writing that the amount allotted by the Institute has been increased and specifies an increased amount, which shall then constitute the total amount allotted by the Institute to this Contract.
- (f) The estimated cost shall be increased to the extent that (i) the amount allotted by the Institute or, (ii) if this is a cost-sharing contract, the amount then allotted by the Institute to the Contract plus the Contractor's corresponding share, exceeds the estimated cost specified in the Schedule. If this is a cost sharing contract, the increase shall be allocated in accordance with the formula specified in the Schedule.
 - (g) No notice, communication, or representation in any form other than that specified in subparagraph (e)(2) above, or from any person other than a duly authorized representative of JPL, shall affect the amount allotted by the Institute to this Contract. In the absence of the specified notice, the Institute is not obligated to reimburse the Contractor for any costs in excess of the total amount allotted by the Institute to this Contract, whether incurred during the course of the Contract or as a result of termination.
 - (h) When and to the extent that the amount allotted by the Institute to the Contract is increased, any costs the Contractor incurs before the increase that are in excess of (i) the amount previously allotted by the Institute to the Contract, or (ii) if this is a cost-sharing Contract, the amount previously allotted by the Institute plus the Contractor's corresponding share, shall be allowable to the same extent as if incurred afterward, unless JPL issues a termination or other notice and directs that the increase is solely to cover termination or other specified expenses.
 - (i) Change orders shall not be considered an authorization to exceed the amount allotted by the Institute specified in the Schedule, unless they contain a statement increasing the amount allotted.
 - (j) Nothing in this Article shall affect the right of JPL to terminate this Contract. If this Contract is terminated, JPL and the Contractor shall negotiate an equitable distribution of all property produced or purchased under the Contract, based upon the share of costs incurred by each.
 - (k) If the Institute does not allot sufficient funds to allow completion of the work, the Contractor is entitled to a percentage of the fee specified in the Schedule equaling the percentage of completion of the work contemplated by this Contract.

LIMITATION OF LIABILITY [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, CREI – 8/01] [FAR 52.246-23, 52.246-24, and 52.246-25 – 2/97]

This Article includes 3 Parts: Part 2, Limitation of Liability – High Value Items, applies to all items delivered under this Contract to JPL which have a unit cost exceeding \$100,000; Part 1, Limitation of Liability, applies to all other items delivered under this Contract. Part 3, Limitation of Liability – Services, applies if the contract is over \$100,000 and requires the performance of services.

PART 1: LIMITATION OF LIABILITY

(applies to all items delivered under this Contract other than High Value Items)

- (a) Except as provided in paragraphs (b) and (c) below, and except for remedies expressly provided elsewhere in this Contract, the Contractor shall not be liable for loss of or damage to property of the Government (excluding the supplies delivered under this Contract) that (i) occurs after acceptance of the supplies delivered under this Contract and (ii) results from any defects or deficiencies in the supplies.
- (b) The limitation of liability under paragraph (a) above shall not apply when a defect or deficiency in, or the acceptance of, the supplies results from willful misconduct or lack of good faith on the part of any of the Contractor's managerial personnel. The term "Contractor's managerial personnel," as used in this Article, means the Contractor's directors, officers, and any of the Contractor's managers, superintendents, or equivalent representatives who have supervision or direction of:
 - (1) All or substantially all of the Contractor's business;
 - (2) All or substantially all of the Contractor's operations at any one plant, laboratory, or separate location at which the Contract is being performed; or

- (3) A separate and complete major industrial operation connected with the performance of this Contract.
- (c) If the Contractor carries insurance, or has established a reserve for self-insurance, covering liability for loss or damage suffered by the Institute or the Government through purchase or use of the supplies required to be delivered under this Contract, the Contractor shall be liable to the Institute and the Government, to the extent of such insurance or reserve, for loss of or damage to property of the Institute and the Government occurring after acceptance of, and resulting from any defects or deficiencies in, the supplies delivered under this Contract.
- (d) The Contractor shall include this Article, including this paragraph (d), supplemented as necessary to reflect the relationship of the contracting parties, in all subcontracts.

PART 2: LIMITATION OF LIABILITY – HIGH VALUE ITEMS

(applies to all items delivered under this Contract to JPL which have a unit cost exceeding \$100,000)

- (a) Except as provided in paragraphs (b) through (e) below, and notwithstanding any other provision of this Contract, the Contractor shall not be liable for loss of or damage to property of the Institute or the Government (including the supplies delivered under this Contract) that:
 - (1) Occurs after JPL acceptance of the supplies delivered under this Contract; and
 - (2) Results from any defects or deficiencies in the supplies.
- (b) The limitation of liability under paragraph (a) above shall not apply when a defect or deficiency in, or JPL's acceptance of, the supplies results from willful misconduct or lack of good faith on the part of any of the Contractor's managerial personnel. The term "Contractor's managerial personnel," as used in this Article, means the Contractor's directors, officers and any of the Contractor's managers, superintendents, or equivalent representatives who have supervision or direction of:
 - (1) All or substantially all of the Contractor's business;
 - (2) All or substantially all of the Contractor's operations at any one plant, laboratory, or separate location at which the Contract is being performed; or
 - (3) A separate and complete major industrial operation connected with the performance of this Contract.
- (c) If the Contractor carries insurance, or has established a reserve for self-insurance, covering liability for loss or damage suffered by the Institute or the Government through purchase or use of the supplies required to be delivered under this Contract, the Contractor shall be liable to the Institute and the Government, to the extent of such insurance or reserve, for loss of or damage to property of the Government occurring after JPL acceptance of, and resulting from any defects or deficiencies in, the supplies delivered under this Contract.
- (d) (1) This Article does not diminish the Contractor's obligations, to the extent that they arise otherwise under this Contract, relating to correction, repair, replacement, or other relief for any defect or deficiency in supplies delivered under this Contract.
- (2) Unless this is a cost-reimbursement contract, if loss or damage occurs and correction, repair, or replacement is not feasible or desired by JPL, the Contractor shall, as determined by JPL:
 - (A) Pay the Institute the amount it would have cost the Contractor to make correction, repair, or replacement before the loss or damage occurred; or
 - (B) Provide other equitable relief.
- (e) This Article shall not limit or otherwise affect the Institute's or the Government's rights under Articles, if included in this Contract, that cover:
 - (1) Warranty of technical data;
 - (2) Ground and flight risks or aircraft flight risks; or
 - (3) Government property.
- (f) In each subcontract, except a subcontract covered by paragraph (g) below, the Contractor shall insert the appropriate Article, supplemented as necessary to reflect the relationship of the contracting parties, as follows:
 - (1) In subcontracts for high-value items only, after obtaining JPL's advance written approval, insert this Article, including this paragraph (f).

- (2) In subcontracts for other end items only, insert the clause at FAR subsection 52.246-23, Limitation of Liability.
- (g) In any subcontract for both high-value items for which this Article is appropriate, and other end items for which the clause at FAR subsection 52.246-23, and any corresponding implementing or supplementing provisions in the NFS, is appropriate, after obtaining the JPL's advance written approval to use this Article, the Contractor shall:
 - (1) Include both this Article and the FAR clause;
 - (2) Identify high-value items by line item; and
 - (3) Insert the following preamble before paragraph (a) of this Article as used in that subcontract:

"(This Article shall apply only to those items identified in this Contract as being subject to this Article.)"

PART 3: LIMITATION OF LIABILITY – SERVICES

(applies if the contract is over \$100,000 and requires the performance of services)

- (a) Except as provided in paragraphs (b) and (c) below, and except to the extent that the Contractor is expressly responsible under this Contract for deficiencies in the services required to be performed under it (including any materials furnished in conjunction with those services), the Contractor shall not be liable for loss of or damage to property of the Institute or the Government that:
 - (1) Occurs after Institute acceptance of services performed under this Contract; and
 - (2) Results from any defects or deficiencies in the services performed or materials furnished.
- (b) The limitation of liability under paragraph (a) above shall not apply when a defect or deficiency in, or the Institute acceptance of, services performed or materials furnished results from willful misconduct or lack of good faith on the part of any of the Contractor's managerial personnel. The term "Contractor's managerial personnel," as used in this provision, means the Contractor's directors, officers, and any of the Contractor's managers, superintendents, or equivalent representatives who have supervision or direction of:
 - (1) All or substantially all of the Contractor's business;
 - (2) All or substantially all of the Contractor's operations at any one plant, laboratory, or separate location at which the Contract is being performed; or
 - (3) A separate and complete major industrial operation connected with the performance of this Contract.
- (c) If the Contractor carries insurance, or has established a reserve for self-insurance, covering liability for loss or damage suffered by the Institute or the Government through the Contractor's performance of services or furnishing of materials under this Contract, the Contractor shall be liable to the Institute or the Government, to the extent of such insurance or reserve, for loss of or damage to property of the Institute or the Government occurring after Institute acceptance of, and resulting from any defects and deficiencies in, services performed or materials furnished under this Contract.
- (d) The Contractor shall include this provision, including this paragraph (d), supplemented as necessary to reflect the relationship of the contracting parties, in all subcontracts over \$25,000.

LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS [CT, FP-NR&D, FP-R&D, T&MC, LHT&M, FPC, CREI, A-E – 4/99] [FAR 52.203-12 – 6/97]

(This Article applies if this Contract is expected to exceed \$100,000.)

Incorporate by reference FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions (June 1997).

LIMITATION ON WITHHOLDING OF PAYMENTS [CT, LHT&M, T&MC, CREI – 4/99] [FAR 52.232-9 – 4/84]

If more than one Article of this Contract authorizes the temporary withholding of amounts otherwise payable to the Contractor for supplies delivered or services performed, the total of the amounts withheld at any one time shall not exceed the greatest amount that may be withheld under any one Article at that time; provided, that this limitation shall not apply to:

- (a) Withholdings pursuant to any Article relating to wages or hours of employees;
- (b) Withholdings not specifically provided for by this Contract; and

- (c) The recovery of overpayments.

MATERIAL REQUIREMENTS [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI – 4/99] [FAR 52.211-5 – 10/97]

(a) Definitions.

As used in this Article:

- (1) New means composed of previously unused components, whether manufactured from virgin material, recovered material in the form of raw material, or materials and by-products generated from, and reused within, an original manufacturing process; provided that the supplies meet contract requirements, including but not limited to, performance, reliability, and life expectancy.
 - (2) Reconditioned means restored to the original normal operating condition by readjustments and material replacement.
 - (3) Recovered material means waste materials and by-products that have been recovered or diverted from solid waste including post-consumer material, but such term does not include those materials and by-products generated from, and commonly reused within, an original manufacturing process.
 - (4) Remanufactured means factory rebuilt to original specifications.
 - (5) Virgin material means previously unused raw material, including previously unused copper, aluminum, lead, zinc, iron, other metal or metal ore, or any undeveloped resource that is, or with new technology will become, a source of raw materials.
- (b) Unless this contract otherwise requires virgin material or supplies composed of or manufactured from virgin material, the Contractor shall provide supplies that are new, as defined in this Article.
- (c) A proposal to provide unused former Government surplus property shall include a complete description of the material, the quantity, the name of the Government agency from which acquired, and the date of acquisition.
- (d) A proposal to provide used, reconditioned, or remanufactured supplies shall include a detailed description of such supplies and shall be submitted to JPL for approval.
- (e) Used, reconditioned, or remanufactured supplies, or unused former Government surplus property, shall not be used unless the Contractor has proposed the use of such supplies, and JPL has authorized their use.

NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [FAR 52.227-2 – 8/96]

(The provisions of this Article shall be applicable only if the amount of this Contract is expected to exceed \$100,000, except when complete performance and delivery are outside the United States, its possessions, and Puerto Rico, unless ultimate delivery is into those areas.)

- (a) The Contractor shall report to the Contracting Officer and JPL, promptly and in reasonable written detail, each notice or claim of patent or copyright infringement based on the performance of this Contract of which the Contractor has knowledge.
- (b) In the event of any claim or suit against the Government on account of any alleged patent or copyright infringement arising out of the performance of this Contract or out of the use of any supplies furnished or work or services performed under this Contract, the Contractor shall furnish to the Government, when requested by the Contracting Officer, all evidence and information in possession of the Contractor pertaining to such suit or claim. Such evidence and information shall be furnished at the expense of the Government except where the Contractor has agreed to indemnify the Government.
- (c) The Contractor agrees to include, and require inclusion of, this Article in all subcontracts at any tier for supplies or services (including construction and architect-engineer subcontracts and those for material, supplies, models, samples, or design or testing services) expected to exceed \$100,000.

NOTICE OF RADIOACTIVE MATERIALS [CT, FP-NR&D, FP-R&D, CIS, T&MC, LH/T&M, FPC, CREI – 4/99] [FAR 52.223-7 – 1/97]

(This Article is applicable only if this Contract is for radioactive materials as defined in this provision.)

Incorporate FAR 52.223-7 (January 1997) with JPL negotiator in lieu of Contracting Officer and adding JPL with the Government in all respects.

NOTICE TO JPL OF LABOR DISPUTES [CT, FP-NR&D, FPR&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [FAR 52.222-1 – 2/97]

- (a) If the Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay the timely performance of this Contract, the Contractor shall immediately give notice to JPL. The initial notice shall include the following:
- (1) Identification of parts/materials, etc., which are or may be affected;
 - (2) Brief description of work-around plans to avoid delivery or performance delays. If the actual or potential dispute involves a lower-tier subcontractor, advise as to potential alternate sources;
 - (3) Other Government agencies having responsibility for any functions concerning the affected operation, e.g., quality control, agency resident representative, etc., and the title, name and telephone of the agency representative.
 - (4) Other Government agencies which have been notified of the situation, and if available, the title, name and telephone number of any representative of another agency who is involved with the actual or threatened labor dispute;
 - (5) Specific information regarding transportation of parts/materials or personnel which is or may be affected;
 - (6) Manufacturer/Subcontractor and union data to include:
 - (A) Name, address and telephone numbers of the manufacturer/subcontractor representative and Industrial Relations Representative to be contacted for further information;
 - (B) Union's name and local lodge number, if known.

If any of the required information is not available when providing the initial notice, indicate when it is estimated that such information can be provided.

- (b) The Contractor agrees to insert the substance of this Article, including this paragraph (b), in any subcontract to which a labor dispute may delay the timely performance of this Contract; except that each such subcontract shall provide that, in the event its timely performance is delayed or threatened by delay by any actual or potential labor dispute, the subcontractor shall immediately notify the next higher-tier subcontractor or JPL, as the case may be, concerning the dispute.

ORDER OF PRECEDENCE [CT, FP-NR&D, FPR&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [FAR 52.215-8 – 10/97]

- (a) The rights and obligations of the parties of this Contract shall be subject to and governed by the Schedule, the General Provisions (the term "General Provisions" includes any "Additional General Provisions"), and any proposals, specifications or other documents or provisions which are made a part of this Contract by reference or otherwise.
- (b) To the extent of any inconsistency between (i) the Schedule, other than the Alterations Article, (ii) the Alterations Article in the Schedule, and (iii) the GPs, the inconsistency will be resolved in the following order of priority:
- (1) The Alterations Article.
 - (2) The GPs not altered.
 - (3) The Schedule, other than the Alterations Article.
- (c) To the extent of any inconsistency between
- (1) the Schedule, other than any proposals, specifications or other documents or provisions which are made a part of this Contract by reference or otherwise, in the Schedule, and
 - (2) any proposals, specifications or other documents or provisions which are made a part of this Contract by reference or otherwise in the Schedule,
- (c)(1) has order of precedence over (c)(2).
- (d) All provisions of this Contract which are required by their terms to be included in subcontracts shall be required by the Contractor to take precedence in the subcontract over any other provisions.

PAYMENT FOR OVERTIME PREMIUMS [CT, CREI – 4/99]

- (a) Allowable cost shall not include any amount on account of overtime premiums, except to the extent that they either:

- (1) Are approved in writing by JPL; or
- (2) Are paid for work:
 - (A) Necessary to cope with emergencies such as those resulting from accidents, natural disasters, breakdowns of production equipment, or occasional production bottlenecks of a sporadic nature;
 - (B) By indirect-labor employees such as those performing duties in connection with administration, protection, transportation, maintenance, standby plant protection, operation of utilities, or accounting;
 - (C) To perform tests, industrial processes, laboratory procedures, loading or unloading of transportation conveyances, and operations in flight or afloat that are continuous in nature and cannot reasonably be interrupted or completed otherwise; or
 - (D) That will result in lower overall costs to the Institute.
 - (E) For pre-launch activities and mission performance or delivery related events of an urgent nature.
- (b) The cost of overtime premiums otherwise allowable under (a) above shall be allowed only to the extent the amount thereof is reasonable and properly allocable to the work under this Contract.
- (c) Any request for estimated overtime premiums submitted for approval pursuant to (a) (1) above shall include all estimated overtime for contract completion and shall:
 - (1) Identify the work unit, e.g., department or section in which the requested overtime will be used, together with present workload, staffing, and other data of the affected unit sufficient to permit JPL to evaluate the necessity for the overtime;
 - (2) Demonstrate the effect that denial of the request will have on contract delivery or performance schedule;
 - (3) Identify the extent to which approval of overtime would affect the performance or cost in connection with other JPL contracts, together with identification of each affected contract; and
- (4) Provide reasons why the required work cannot be performed by using multishift operations or by employing additional personnel.

PREFERENCE FOR PRIVATELY OWNED U.S.-FLAG COMMERCIAL VESSELS [CT, FP-NR&D, FPR&D, T&MC, LH/T&M, FPC, CREI – 8/01] [FAR 52.247-64 – 6/97]

(This Article is applicable when the Contract or subcontract amount is expected to exceed \$100,000. This Article is not applicable for the acquisition of commercial items or commercial components.)

- (a) Except as provided in paragraph (b) below, the Contractor shall use privately owned U.S.-flag commercial vessels, and no others, in the ocean transportation of any supplies to be furnished under this Contract.
- (b) If such vessels are not available for timely shipment at rates that are fair and reasonable for privately owned U.S.-flag commercial vessels, the Contractor shall notify JPL and request (i) authorization to ship in foreign-flag vessels or (ii) designation of available U.S.-flag vessels. If the Contractor is authorized in writing by JPL to ship the supplies in foreign-flag vessels, the Contract price shall be equitably adjusted to reflect the difference in costs of shipping the supplies in privately owned U.S.-flag commercial vessels and in foreign-flag vessels.
- (c) (1) The Contractor shall submit one legible copy of a rated on-board ocean bill of lading for each shipment to both (i) the Contracting Officer and (ii) the Office of Cargo Preference, Maritime Administration (MAR-590) 400 Seventh Street, SW, Washington, D.C. 20590. Contractor and subcontractor bills of lading shall be submitted through JPL.
- (2) The Contractor shall furnish these bill of lading copies (i) within 20 working days of the date of loading for shipments originating in the United States or (ii) within 30 working days for shipments originating outside the United States. Each bill of lading copy shall contain the following information:
 - (A) NASA shown as the sponsoring U.S. Government agency.
 - (B) Name of vessel.
 - (C) Vessel flag of registry.
 - (D) Date of loading.
 - (E) Port of loading.
 - (F) Port of final discharge.

- (G) Description of commodity.
 - (H) Gross weight in pounds and cubic feet, if available.
 - (I) Total ocean freight revenue in U.S. dollars.
- (d) For purchases over \$100,000, the Contractor shall insert the substance of this Article, including this paragraph (d), in all purchase orders and subcontracts under this Contract.
- (e) The requirement in paragraph (a) does not apply to:
- (1) Purchases not exceeding \$100,000;
 - (2) Cargoes carried in vessels of the Panama Canal Commission or as required or authorized by law or treaty;
 - (3) Ocean transportation between foreign countries of supplies purchased with foreign currencies made available, or derived from funds that are made available, under the Foreign Assistance Act of 1961 (22 U.S.C. 2353);
 - (4) Shipments of classified supplies when the classification prohibits the use of non-Government vessels; and
 - (5) Subcontracts for the acquisition of commercial items or commercial components.
- (f) Guidance regarding fair and reasonable rates for privately owned U.S.-flag commercial vessels may be obtained from the Office of Costs and Rates, Maritime Administration, 400 Seventh Street, SW, Washington, DC 20590, Phone: 202-366-4610.

PREFERENCE FOR U.S.-FLAG AIR CARRIERS [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [FAR 52.247-63 – 1/97]

(This Article does not apply to contracts or subcontracts for supplies, nonpersonal services, and construction that do not exceed \$100,000. This Article is not applicable to the acquisition of commercial items or commercial components.)

Incorporate by reference FAR 52.247-63, Preference for U.S.-Flag Air Carriers.

PRINTING AND DUPLICATING [CT, FP-NR&D, FP-R&D, LH/T&M, T&MC, CREI, A-E – 4/99] [NFS 1852.208-81 – 8/93]

(This Article does not apply unless this Contract requires the Contractor to provide printing or significant reproduction, i.e., in excess of 5,000 copies of a single page or in excess of 25,000 copies in the aggregate of multiple pages.)

- (a) NFS 1852.208-81, Restrictions on Printing and Duplicating (August 1993), is hereby incorporated into this Article in its entirety.

Note 1: The terms "documentation" referred to in paragraph (a), "printing" referred to in paragraph (b), and "production units" referred to in paragraph (c) of NFS 1852.208-81, Restrictions on Printing and Duplicating (August 1993), pertain solely to "Government publications." "Government publications" is defined as (i) reports intended primarily for internal use by the Government and (ii) reports or other materials of the type that the Government itself distributes to the public under an agency program. "Government publications" shall, unless subject to exemption under applicable regulations, be printed by or through the Government Printing Office, even though the distribution of these reports and materials may be effectuated by the Contractor for the Government.

Examples of documents which are "Government publications" include, but are not limited to: (i) publications released by the Contractor or a subcontractor to the public for the purpose of promoting NASA or a Government agency sponsor; (ii) deliverable final reports, but not interim drafts of such reports; (iii) deliverable review board presentations and conclusions in which a majority of the review board membership consists of Government representatives.

Examples of documents which are not "Government publications" include, but are not limited to: (i) publications for internal usage and communication by JPL or any contractor or a subcontractor such as JPL's or a contractor's Telephone Directory or JPL's or a contractor's internal newsletter; (ii) public information, education and public service documents, and award certificates printed for JPL's or a contractor's usage rather than Government usage, including those which may contain an incidental reference to sponsorship by NASA or another Government agency; (iii) publications for which the printing costs are not paid for by the Government; (iv) non-deliverable reports provided to the Government for informational purposes which are suitable for publication in academic, technical, or professional journals and similar publications; and (v) review board presentations and conclusions in which a majority of the formal

review board membership consists of JPL, contractor, or subcontractor representatives, where Government attendance is only incidental, and the Contract does not expressly require Government approval of the proceedings.

- (b) To the extent that it applies to subcontractors, the Contractor will implement NASA Policy Guideline (NPG) 1490.5A, Procedural Guidance for Printing, Duplicating and Copying Management, dated July 1997, for all printing, duplicating, copying, forms and mail management related to the performance of this contract.

Note 2: Requests for waivers to permit commercial printers to print "Government publications" in cases of exigencies or other appropriate circumstances shall be submitted by the Contractor to the JPL negotiator for submission to the NASA Printing Management Officer through the Contracting Officer.

PROHIBITION OF CONTRACTOR USE OF PRIVATELY OWNED AIRCRAFT IN CONTRACT PERFORMANCE

[CT, FPNR&D, FPR&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99]

The Contractor, its employees, agents and subcontractors, shall not use privately owned (noncommercial) aircraft in the performance of this Contract without prior approval of JPL. Any request for approval to use privately owned aircraft must include a certificate of insurance as evidence that the Contractor has in effect Aircraft Liability Insurance coverage of not less than \$5,000,000 for all deaths, injuries and property damage arising from one accident or occurrence. The Contractor shall be required as a condition of JPL's approval to submit an endorsement naming the Institute as an additional insured in such aircraft liability insurance policy. The Contractor shall include this provision in any subcontract involving travel subject to JPL approval or requiring that the subcontractor utilize a privately owned (noncommercial) aircraft.

RELEASE OF INFORMATION [CT, FPNR&D, FPR&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99]

(This Article does not apply if the Article entitled "Release of Information - Preliminary Engineering Report (PER)" is applicable.)

- (a) The Contractor agrees that all information released by the Contractor for publicity or promotional purposes (e.g., news and photo releases, exhibit copy, motion picture scripts, advertising copy) directly related to the Contractor's work with and for JPL will be submitted to JPL for review for technical accuracy prior to issuance. (See enclosed form letter JPL 1737, "Release of Information.")
- (b) The Contractor agrees to insert this clause including this paragraph in all subcontracts.

REQUIRED NOTICES [CT, FPNR&D, FPR&D, T&MC, LH/T&M, FPC, CREI – 4/99]

Unless otherwise specified in this Contract, any notice which the Contractor is required to provide to JPL under any provision of this Contract shall be directed to the JPL Negotiator or the Manager, Acquisition Division, JPL, or their authorized representatives.

RESTRICTIONS ON CERTAIN FOREIGN PURCHASES [CT, FPNR&D, FPR&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [FAR 52.225-11 – 10/96]

Incorporate by reference FAR 52.225-11, Restrictions on Certain Foreign Purchases.

RESTRICTIONS ON SUBCONTRACTOR SALES [CT, FPNR&D, FPR&D, T&MC, LH/T&M, CREI – 4/99] [FAR 3.503, 52.203-6 – 7/95]

(This Article is applicable to contracts and subcontracts exceeding \$100,000 for other than commercial items.)

Incorporate by reference FAR 52.203-6, Restrictions on Subcontractor Sales.

REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS

(PRB) [CT, CREI – 4/99]

- (a) This Article is applicable if certified cost or pricing data is required or if any preaward or post-award cost determinations will be subject to FAR Part 31.
- (b) The Contractor shall promptly notify the JPL Negotiator in writing when it determines that it will terminate or reduce a PRB plan. If PRB fund assets revert, or inure, to the Contractor or are constructively received by it under a plan termination or otherwise, the Contractor shall make a refund or give a credit to the Institute for its equitable share as required by FAR 31.205-6(o)(6). The Contractor shall include the substance of this Article in all subcontracts under this Contract that meet the applicability requirements of FAR 15.408(j)).

RIGHTS IN DATA – GENERAL [CT, FP-NR&D, FP-R&D, LH/T&M, T&MC – 8/01] [FAR 52.227-14 – 6/87; NFS 1852.227-14 – 6/87]

(If the Article entitled "Existing Commercial Computer Software - Licensing" is applicable to this Contract, it shall apply in lieu of this Article regarding any acquisition of commercial computer software.)

(a) Definitions.

- (1) "Computer software," as used in this Article, means computer programs, computer data bases, and documentation thereof.
- (2) "Data," as used in this Article, means recorded information, regardless of form or the media on which it may be recorded. The term includes technical data, and computer software. The term does not include information incidental to Contract administration, such as financial, administrative, cost or pricing, or management information.
- (3) "Form, fit, and function data," as used in this Article, means data relating to items, components, or processes that are sufficient to enable physical and functional interchangeability, as well as data identifying source, size, configuration, mating, and attachment characteristics, functional characteristics, and performance requirements; except that for computer software it means data identifying source, functional characteristics, and performance requirements but specifically excludes the source code, algorithm, process, formulae, and flow charts of the software.
- (4) "Institute" means the California Institute of Technology as a party to this Contract.
- (5) "JPL" means the Jet Propulsion Laboratory as the organizational element of the Institute having responsibility for administration of this Contract. JPL's rights under this Contract are rights of the California Institute of Technology as a party to this Contract.
- (6) "Limited rights," as used in this Article, means the rights of the Government, or in support and furtherance of its Government contract obligations, the Institute, in limited rights data as set forth in the Limited Rights Notice of subparagraph (g)(2) if included in this Article.
- (7) "Limited rights data," as used in this Article, means data (other than computer software) that embody trade secrets or are commercial or financial and confidential or privileged, to the extent that such data pertain to items, components, or processes developed at private expense, including minor modifications thereof.
- (8) "Restricted computer software," as used in this Article, means computer software developed at private expense and that is a trade secret; is commercial or financial and is confidential or privileged; or is published copyrighted computer software; including minor modifications of such computer software.
- (9) "Restricted rights," as used in this Article, means the rights of the Government, and in support and in furtherance of its Government contract obligations, the Institute, in restricted computer software, as set forth in a Restricted Rights Notice of subparagraph (g)(3) if included in this Article, or as otherwise may be provided in a collateral agreement incorporated in and made part of this Contract, including minor modifications of such computer software.
- (10) "Technical data," as used in this Article, means data (other than computer software) which are of a scientific or technical nature.
- (11) "Unlimited rights," as used in this Article, means the right of the Government, or in support and furtherance of its Government contract obligations, the Institute, to use, disclose, reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, in any manner and for any purpose, and to have or permit others to do so.

(b) Allocation of Rights.

- (1) Except as provided in paragraph (c) of this Article regarding copyright, the Government and in support and furtherance of its Government contract obligations, the Institute, shall have unlimited rights in:
 - (A) Data first produced in the performance of this Contract;
 - (B) Form, fit, and function data delivered under this Contract;
 - (C) Data delivered under this Contract (except for restricted computer software) that constitute manuals or instructional and training material for installation, operation, or routine maintenance and repair of items, components, or processes delivered or furnished for use under this Contract; and

- (D) All other data delivered under this Contract unless provided otherwise for limited rights data or restricted computer software in accordance with paragraph (g) of this Article.

(2) The Contractor shall have the right to:

- (A) Use, release to others, reproduce, distribute, or publish any data first produced or specifically used by the Contractor in the performance of this Contract, unless provided otherwise in paragraph (d) of this Article;
- (B) Protect from unauthorized disclosure and use those data which are limited rights data or restricted computer software to the extent provided in paragraph (g) of this Article;
- (C) Substantiate use of, add or correct limited rights, restricted rights, or copyright notices and to take other appropriate action, in accordance with paragraphs (e) and (f) of this Article; and
- (D) Establish claim to copyright subsisting in data first produced in the performance of this Contract to the extent provided in subparagraph (c)(1) of this Article.

(c) Copyright

(1) Data First Produced in the Performance of This Contract.

- (A) Unless provided otherwise in paragraph (d) of this Article, the Contractor may establish, without prior approval of the Contracting Officer, claim to copyright subsisting in scientific and technical articles based on or containing data first produced in the performance of this Contract and published in academic, technical or professional journals, symposia proceedings or similar works. The prior, express written permission of the Contracting Officer through JPL is required to establish claim to copyright subsisting in all other data first produced in the performance of this Contract.
- (B) When claim to copyright is made, the Contractor shall affix the applicable copyright or notices of 17 U.S.C. 401 or 402 and acknowledgment of Government sponsorship (including the Prime Contract number) to the data when such data are delivered to JPL, as well as when the data are published or deposited for registration as a published work in the U.S. Copyright Office. (Acknowledgment shall include a statement that "This work was performed for the Jet Propulsion Laboratory, California Institute of Technology, sponsored by the United States Government under a Prime Contract between the California Institute of Technology and NASA.")
- (C) For data other than computer software, the Contractor grants to the Government, and in support and furtherance of its Government contract obligations, the Institute, and others acting on their behalf, a paid-up, nonexclusive, irrevocable worldwide license in such copyrighted data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly by or on behalf of the Government.
- (D) For computer software, the Contractor grants to the Government, and in support and furtherance of its Government contract obligations, the Institute, and others acting on their behalf, a paid-up, nonexclusive, irrevocable worldwide license in such copyrighted computer software to reproduce, prepare derivative works, and perform publicly and display publicly by or on behalf of the Government.

(2) Data Not First Produced in the Performance of This Contract. The Contractor shall not, without prior written permission of JPL, incorporate in data delivered under this Contract any data not first produced in the performance of this Contract and which contains the copyright notice of 17 U.S.C. 401 or 402, unless the Contractor identifies such data and grants to the Government, and in support and furtherance of its Government contract obligations, the Institute, or acquires on their behalf, a license of the same scope as set forth in subparagraph (c)(1) of this Article; provided, however, that if such data are computer software, the Contractor grants to the Government and in support and furtherance of its Government contract obligations, the Institute, or acquires on their behalf, a paid-up nonexclusive irrevocable worldwide license as set forth in subparagraph (g)(3) of this Article.

(3) Removal of Copyright Notices. JPL agrees not to remove any copyright notices placed on data pursuant to this paragraph (c), and to include such notices on all reproductions of the data.

(d) Release, Publication and Use of Data

- (1) The Contractor shall have the right to use, release to others, reproduce, distribute, or publish any data other than computer software first produced or specifically used by the Contractor in the performance of this Contract, except to the extent such data may be subject to the Federal export control or national security

laws or regulations, or unless otherwise provided in this paragraph of this Article or expressly set forth in this Contract.

- (2) The Contractor agrees that to the extent it receives or is given access to data necessary for the performance of this Contract which contain restrictive markings, the Contractor shall treat the data in accordance with such markings unless otherwise specifically authorized in writing by JPL.
- (3) (A) The Contractor agrees not to establish claim to copyright or publish or release to others any computer software first produced in the performance of this Contract without the Contracting Officer's prior written permission.
- (B) If the Government desires to obtain copyright in computer software first produced in the performance of this Contract for which permission to copyright has not been granted to the Contractor as set forth in subdivision (d)(3)(A) of this Article, the Contracting Officer or the Institute may direct the Contractor to assert, or authorize the assertion of, claim to copyright in said data and to assign, or obtain the assignment of, such copyright to the Government or its designated assignee.
- (C) Whenever the word "establish" is used in this clause, with reference to a claim to copyright, it shall be construed to mean "assert."

(e) Unauthorized Marking of Data.

- (1) Notwithstanding any other provisions of this Contract concerning inspection or acceptance, if any data delivered under this Contract are marked with the notices specified in subparagraph (g)(2) or (g)(3) of this Article and use of such is not authorized by this Article, or if such data bears any other restrictive or limiting markings not authorized by this Contract, JPL may at any time either return the data to the Contractor, or cancel or ignore the markings. However, the following procedures shall apply prior to canceling or ignoring the markings:
 - (A) JPL shall make written inquiry to the Contractor affording the Contractor 30 days from receipt of the inquiry to provide written justification to substantiate the propriety of the markings;
 - (B) If the Contractor fails to respond or fails to provide written justification to substantiate the propriety of the markings within the 30-day period (or a longer time not exceeding 90 days approved in writing by the Contracting Officer through JPL for good cause shown), the Government or JPL shall have the right to cancel or ignore the markings at any time after said period and the data will no longer be made subject to any disclosure prohibitions.
 - (C) If the Contractor provides written justification to substantiate the propriety of the markings within the period set in subdivision (e)(1)(A) of this Article, the Contracting Officer through JPL shall consider such written justification and determine whether or not the markings are to be canceled or ignored. If the Contracting Officer through JPL determines that the markings are authorized, the Contractor shall be so notified in writing. If the Contracting Officer through JPL determines, with concurrence of NASA, that the markings are not authorized, the Contracting Officer through JPL shall furnish the Contractor a written determination, which determination shall become the final Government decision regarding the appropriateness of the markings unless the Contractor files suit in a court of competent jurisdiction within 90 days of receipt of the Contracting Officer's decision. The Government and JPL shall continue to abide by the markings under this subdivision (e)(1)(C) until final resolution of the matter either by the Contracting Officer's determination becoming final (in which instance the Government or JPL shall thereafter have the right to cancel or ignore the markings at any time and the data will no longer be made subject to any disclosure prohibitions), or by final disposition of the matter by court decision if suit is filed.
- (2) The time limits in the procedures set forth in subparagraph (e)(1) of this Article may be modified in accordance with NASA regulations implementing the Freedom of Information Act (5 U.S.C. 552) if necessary to respond to a request thereunder.
- (3) This paragraph (e) does not apply if this Contract is for a major system or for support of a major system by a civilian agency other than NASA and the U.S. Coast Guard agency subject to the provisions of Title III of the Federal Property and Administrative Services Act of 1949.
- (4) (RESERVED)

(f) Omitted or Incorrect Markings.

- (1) Data delivered to the Government or JPL without either the limited rights or restricted rights notice as authorized by paragraph (g) of this Article, or the copyright notice required by paragraph (c) of this Article, shall be deemed to have been furnished with unlimited rights, and the Government and the Institute assume no liability for the disclosure, use, or reproduction of such data. However, to the extent the data has not been disclosed without restriction outside the Government or JPL, the Contractor may request, within six months (or longer time approved by JPL for good cause shown) after delivery of such data, permission to have notices placed on qualifying data at the Contractor's expense, and JPL may agree to do so if the Contractor:
 - (A) Identifies the data to which the omitted notice is to be applied;
 - (B) Demonstrates that the omission of the notice was inadvertent;
 - (C) Establishes that the use of the proposed notice is authorized; and
 - (D) Acknowledges that the Government and the Institute have no liability with respect to the disclosure, use, or reproduction of any such data made prior to the addition of the notice or resulting from the omission of the notice.
- (2) JPL may also:
 - (A) Permit correction at the Contractor's expense of incorrect notices if the Contractor identifies the data on which correction of the notice is to be made, and demonstrates that the correct notice is authorized; or
 - (B) Correct any incorrect notices.

(g) Protection of Limited Rights Data and Restricted Computer Software.

- (1) When data other than that listed in subdivisions (b)(1)(A), (B), and (C) of this Article are specified to be delivered under this Contract and qualify as either limited rights data or restricted computer software, if the Contractor desires to continue protection of such data, the Contractor shall withhold such data and not furnish them to JPL under this Contract. As a condition to this withholding, the Contractor shall identify the data being withheld and furnish form, fit, and function data in lieu thereof. Limited rights data that are formatted as a computer data base for delivery to JPL are to be treated as limited rights data and not restricted computer software.
- (2) Notwithstanding paragraph (g)(1) of this Article, the Contract may identify and specify the delivery of limited rights data, or JPL or the Contracting Officer may require by written request the delivery of limited rights data that has been withheld or would otherwise be withholdable. If delivery of such data is so required, the Contractor may affix the following "Limited Rights Notice" to the data and the Institute and the Government will thereafter treat the data, subject to the provisions of paragraphs (e) and (f) of this Article, in accordance with such Notice:

LIMITED RIGHTS NOTICE

- (a) These data are submitted with limited rights under Government contract No. NAS7-1407 (and JPL subcontract No. _____). These data may be reproduced and used by the Institute or the Government with the express limitation that they will not, without written permission of the Contractor, be used for purposes of manufacture nor disclosed outside the Institute or the Government; except that the Institute or the Government may disclose these data outside the Institute or the Government for the following purposes, if any, provided that the Institute or the Government makes such disclosure subject to prohibition against further use and disclosure:
 - (1) Use by support service contractors.
 - (2) (RESERVED)
- (b) This Notice shall be marked on any reproduction of these data, in whole or in part.

(end of notice)

- (3) (A) Notwithstanding paragraph (g)(1) of this Article, the Contract may identify and specify the delivery of restricted computer software, or JPL or the Contracting Officer may require by written request the delivery of restricted computer software that has been withheld or would otherwise be withholdable. If delivery of such computer software is so required, the Contractor may affix the following "Restricted Rights Notice" to the computer software and the Institute and the Government will thereafter treat the

computer software, subject to the provisions of paragraphs (e) and (f) of this Article, in accordance with the Notice:

RESTRICTED RIGHTS NOTICE

- (a) This computer software is submitted with restricted rights under Government contract No. NAS7-1407 (and JPL subcontract No. _____). It may not be used, reproduced, or disclosed by the Institute or the Government except as provided in paragraph (b) of this Notice or as otherwise expressly stated in the Contract.
- (b) This computer software may be:
 - (1) Used or copied for use in or with the computer or computers for which it was acquired, including use at any Institute or Government installation to which such computer or computers may be transferred;
 - (2) Used or copied for use in a backup computer if any computer for which it was acquired is inoperative;
 - (3) Reproduced for safekeeping (archives) or backup purposes;
 - (4) Modified, adapted, or combined with other computer software, provided that the modified, combined, or adapted portions of the derivative software incorporating restricted computer software are made subject to the same restricted rights;
 - (5) Disclosed to and reproduced for use by support service contractors in accordance with subparagraphs (b)(1) through (4) of this Article, provided the Institute or the Government makes such disclosure or reproduction subject to these restricted rights; and
 - (6) Used or copied for use in or transferred to a replacement computer.
- (c) Notwithstanding the foregoing, if this computer software is published copyrighted computer software, it is licensed to the Institute and the Government, without disclosure prohibitions, with the minimum rights set forth in paragraph (b) of this Article.
- (d) Any other rights or limitations regarding the use, duplication, or disclosure of this computer software are to be expressly stated in, or incorporated in, the Contract.
- (e) This Notice shall be marked on any reproduction of this computer software, in whole or in part.

(end of notice)

- (B) Where it is impractical to include the Restricted Rights Notice on restricted computer software, the following short-form Notice may be used in lieu thereof:

RESTRICTED RIGHTS NOTICE - SHORT FORM

Use, reproduction, or disclosure is subject to restrictions set forth in Contract No. NAS7-1407 (and subcontract No. _____ with [name of subcontractor]).

(end of notice)

- (C) If restricted computer software is delivered with the copyright notice of 17 U.S.C. 401, it will be presumed to be published copyrighted computer software licensed to the Institute and the Government without disclosure prohibitions, with the minimum rights set forth in paragraph (b) of this Article, unless the Contractor includes the following statement with such copyright notice: "Unpublished - rights reserved under the Copyright Laws of the United States."
- (h) Subcontracting. The Contractor has the responsibility to obtain from its subcontractors all data and rights therein necessary to fulfill the Contractor's obligations to the Government and the Institute under this Contract. If a subcontractor refuses to accept terms affording the Government or the Institute such rights, the Contractor shall promptly bring such refusal to the attention of JPL and not proceed with subcontract award without further authorization.
- (i) Relationship to Patents. Nothing contained in this Article shall imply a license to the Government or the Institute under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government or the Institute.

- (j) Inspection of Data Withheld. The Contractor agrees, except as may be otherwise specified in this Contract for specific data items listed as not subject to this paragraph, that the Contracting Officer, an authorized representative, or JPL may, up to three years after acceptance of all items to be delivered under this Contract, inspect at the Contractor's facility any data withheld pursuant to subparagraph (g)(1) of this Article, for purposes of verifying the Contractor's assertion pertaining to the limited rights or restricted rights status of the data or for evaluating work performance. Where the first-tier subcontractor whose data are to be inspected demonstrates to the Contracting Officer that there would be a possible conflict of interest if the inspection were made by a particular representative, the Contracting Officer shall designate an alternate inspector.

RIGHTS IN TECHNICAL PROPOSAL DATA [CT, FP-NR&D, FP-R&D, LH/T&M, T&MC, CREI – 4/99] [FAR 52.227-23 – 6/87]

(This Article applies to contracts resulting from a proposal containing technical data. The Article does not cover rights to commercial or financial information contained in the successful proposal.)

It is agreed that as a condition of the award of this Contract, and notwithstanding the conditions of any notice appearing thereon, the Government and the Institute shall have the right to use, duplicate, and disclose, and have others so do, for any purpose whatsoever, the technical data contained in the proposals upon which this Contract and any future modifications are based.

SMALL, SMALL DISADVANTAGED, AND WOMEN-OWNED SMALL BUSINESS SUBCONTRACTING PLAN (S/SD/WOSB PLAN) [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI – 8/01] [FAR 52.219-9 – 8/96]

(This Article is applicable if the basic contract or any separate modification exceeds \$500,000 [\$1,000,000 for construction], except it does not apply to contracts with small businesses or orders under GSA contracts. Work performed outside the United States is exempt from the requirements of this Article.)

- (a) If there will be any subcontracting under this Contract and the basic or any modification exceeds \$500,000, (\$1,000,000 for construction of any public facility), the Contractor agrees to submit for JPL approval a Small, Small Disadvantaged, and Women-Owned Small Business Subcontracting Plan (Plan) and to provide a written update to the Plan for every modification exceeding \$500,000 (\$1,000,000 for construction of a public facility). JPL's approval will be based on the requirements in JPL form 0294 entitled "Requirements for a Subcontracting Plan." The approved Plan and approved updates will be deemed incorporated into this Contract.
- (b) If a Plan is required under this Contract, SF 294, "Subcontracting Report for Individual Contracts," and SF 295, "Summary Subcontract Report," are deliverables, which must be submitted by the Contractor to the JPL Negotiator in accordance with the instructions on the forms.
- (c) It is understood and agreed that the failure of the Contractor to comply in good faith with the Article of this Contract entitled "Utilization of Small, Small Disadvantaged, and Women-Owned Small Business Concerns," or with any Plan required to be included in this Contract, shall be a material breach of this Contract.

STOP WORK ORDER [CT, FP-NR&D, FP-R&D, A-E – 8/01] [FAR 52.242-15 - 8/89]

- (a) JPL may, at any time, by written order to the Contractor, require the Contractor to stop all, or any part, of the work called for by this Contract for a period of 90 days after the order is delivered to the Contractor, and for any further period to which the parties may agree. The order shall be specifically identified as a stop work order issued under this Article. Upon receipt of the order, the Contractor shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Within a period of 90 days after a stop work order is delivered to the Contractor, or within any extension of that period to which the parties shall have agreed, JPL shall either:
- (1) Cancel the stop work order; or
 - (2) Terminate the work covered by such order either for convenience of the Institute or the Government or, if appropriate, for default.
- (b) If a stop work order issued under this Article is canceled or the period of the order or any extension thereof expires, the Contractor shall resume work. JPL shall make an equitable adjustment in the delivery schedule, the contract amount, and in any other provisions of the Contract that may be affected, and the Contract shall be modified, in writing, accordingly, if:
- (1) The stop work order results in an increase in the time required for, or in the Contractor's cost properly allocable to, the performance of any part of this Contract; and

- (2) The Contractor asserts a claim for the adjustment within 30 days after the end of the period of work stoppage; provided, that, if JPL decides the facts justify the action, it may receive and act upon the claim asserted at any time before final payment under this Contract.
- (c) If a stop work order is not canceled and the work covered by the order is terminated for the convenience of the Institute or the Government, JPL shall allow reasonable costs resulting from the stop work order in arriving at the termination settlement.
- (d) If a stop work order is not canceled and the work covered by the order is terminated for default, JPL shall allow, by equitable adjustment or otherwise, reasonable costs resulting from the stop work order.

SUBCONTRACTS [CT, CREI – 4/99]

- (a) JPL reserves the right to require submission of any subcontract or purchase order, and related documentation, for advance consent; in such cases, JPL may, in its discretion, ratify in writing any subcontract, and such ratification shall constitute consent.
- (b) The Contractor agrees that no subcontract (including lower-tier subcontracts) placed under this Contract shall provide for payment on a cost-plus-a-percentage-of-cost basis, and any fee payable under cost-reimbursement type subcontracts shall not exceed the fee limitations in Part 15.404 of FAR and any corresponding implementing or supplementing provisions in the NFS, unless approved by JPL.
- (c) The Contractor shall give JPL immediate notice in writing of any action or suit filed and prompt notice of any claim made against the Contractor by any subcontractor or vendor which, in the opinion of the Contractor, may result in litigation related in any way to this Contract with respect to which the Contractor may be entitled to reimbursement from JPL.
- (d) JPL may, in its discretion, specifically approve in writing any of the provisions of a purchase order or subcontract. However, such approval or the consent of JPL obtained as required by this Article shall not be construed to constitute a determination (i) of the acceptability of any subcontract terms and conditions; (ii) of the allowability of any cost under this Contract; or (iii) to relieve the Contractor of any responsibility for performing this Contract.

SUBCONTRACTS FOR COMMERCIAL ITEMS AND COMMERCIAL COMPONENTS [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI, A-E – 8/01] [FAR 52.244-6 – 10/95]

- (a) Definition.
 - (1) "Commercial item," as used in this Article, has the meaning contained in the "Definitions" Article and in FAR 52.202-1, "Definitions."
 - (2) "Subcontract," as used in this Article, includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.
- (b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this Contract.
- (c) Notwithstanding any other Article of this Contract except to the extent needed to satisfy the technical requirements and technical data (including software) deliverables under this Contract, the Contractor is not required to include any JPL provision or Article, other than those FAR provisions listed below to the extent they are applicable and as may be required to establish the reasonableness of prices under Part 15, in a subcontract at any tier for commercial items or commercial components:
 - (1) 52.222-26, Equal Opportunity (E.O. 11246);
 - (2) 52.222-35, Affirmative Action for Special Disabled and Vietnam Era Veterans (38 U.S.C. 4212(a)); and
 - (3) 52.222-36, Affirmative Action for Handicapped Workers (29 U.S.C. 793).
- (d) The Contractor shall include the terms of this provision, including this paragraph (d), in subcontracts awarded under this Contract.

TERMINATION – COST [CT – 4/99] [FAR 52.249-6 – 9/96]

- (a) JPL may terminate performance of work under this Contract in whole or, from time to time, in part, if:
 - (1) JPL determines that a termination is in the interest of the Institute or the Government.

- (2) The Contractor defaults in performing this Contract and fails to cure the default within 10 days (unless extended by JPL) after receiving a JPL notice specifying the default. "Default" includes failure to make progress in the work so as to endanger performance.
- (b) JPL shall terminate by delivering to the Contractor a Notice of Termination specifying whether termination is for default of the Contractor or for convenience of the Institute or the Government, the extent of termination, and the effective date. If, after termination for default, it is determined that the Contractor was not in default or that the Contractor's failure to perform or to make progress in performance is due to causes beyond the control and without the fault or negligence of the Contractor as set forth in the Article of this Contract entitled "Excusable Delays," the rights and obligations of the parties will be the same as if the termination was for the convenience of the Institute or the Government.
- (c) After receipt of a Notice of Termination, and except as directed by JPL, the Contractor shall immediately proceed with the following obligations, regardless of any delay in determining or adjusting any amounts due under this Article:
- (1) Stop work as specified in the notice.
 - (2) Place no further subcontracts or orders (referred to as subcontracts in this Article), except as necessary to complete the continued portion of the Contract.
 - (3) Terminate all subcontracts to the extent they relate to the work terminated.
 - (4) Assign to JPL, in the manner and to the extent directed by JPL, all right, title, and interest of the Contractor under the subcontracts terminated, in which case JPL shall have the right to settle or to pay any termination settlement proposal arising out of those terminations.
 - (5) With approval or ratification to the extent required by JPL, settle all outstanding liabilities and termination settlement proposals arising from the termination of subcontracts, the cost of which would be reimbursable in whole or in part, under this Contract; approval or ratification will be final for purposes of this Article.
 - (6) Transfer title (if not already transferred) and, as directed by JPL, deliver to JPL (i) the fabricated or unfabricated parts, work in process, completed work, supplies, and other material produced or acquired for the work terminated, (ii) the completed or partially completed plans, drawings, information, and other property that, if the Contract had been completed, would be required to be furnished to JPL, and (iii) the jigs, dies, fixtures, and other special tools and tooling acquired or manufactured for this Contract, the cost of which the Contractor has been or will be reimbursed under this Contract.
 - (7) Complete performance of the work not terminated.
 - (8) Take any action that may be necessary, or that JPL may direct, for the protection and preservation of the property related to this Contract that is in the possession of the Contractor and in which the Government has or may acquire an interest.
 - (9) Use its best efforts to sell, as directed or authorized by JPL, any property of the types referred to in subparagraph (6) above; provided, however, that the Contractor (i) is not required to extend credit to any purchaser and (ii) may acquire the property under the conditions prescribed by, and at prices approved by, JPL. The proceeds of any transfer or disposition will be applied to reduce any payments to be made by the Institute under this Contract, credited to the price or cost of the work, or paid in any other manner directed by JPL.
- (d) The Contractor shall submit complete termination inventory schedules no later than 120 days from the effective date of termination, unless extended in writing by the Contracting Officer upon written request of the Contractor within this 120 day period.
- (e) After expiration of the plant clearance period as defined in Subpart 45.6 of FAR and any corresponding implementing or supplementing provisions in the NFS, the Contractor may submit to JPL a list, certified as to quantity and quality, of termination inventory not previously disposed of, excluding items authorized for disposition by JPL. The Contractor may request JPL to remove those items or enter into an agreement for their storage. Within 15 days, JPL will accept the items and remove them or enter into a storage agreement. JPL may verify the list upon removal of the items, or if stored, within 45 days from submission of the list, and shall correct the list, as necessary, before final settlement.
- (f) After termination, the Contractor shall submit a final termination settlement proposal to JPL in the form and with the certification prescribed by JPL. The Contractor shall submit the proposal promptly, but no later than six months from the effective date of termination, unless extended in writing by JPL upon written request of the

Contractor within this six-month period. However, if JPL determines that the facts justify it, a termination settlement proposal may be received and acted on after six months or any extension. If the Contractor fails to submit the proposal within the time allowed, JPL may determine, on the basis of information available, the amount, if any, due the Contractor because of the termination and shall pay the amount determined.

- (g) Subject to paragraph (e) above, the Contractor and JPL may agree on the whole or any part of the amount to be paid (including an allowance for fee) because of the termination. The Contract shall be amended, and the Contractor paid the agreed amount.
- (h) If the Contractor and JPL fail to agree in whole or in part on the amount of costs and/or fee to be paid because of the termination of work, JPL shall determine, on the basis of information available, the amount, if any, due the Contractor, and shall pay that amount, which shall include the following:
 - (1) All costs reimbursable under this Contract, not previously paid, for the performance of this Contract before the effective date of the termination, and such of those costs that may continue for a reasonable time with the approval of or as directed by JPL; however, the Contractor shall discontinue those costs as rapidly as practicable.
 - (2) The cost of settling and paying termination settlement proposals under terminated subcontracts that are properly chargeable to the terminated portion of the Contract if not included in subparagraph (1) above.
 - (3) The reasonable costs of settlement of the work terminated, including (i) accounting, legal, clerical, and other expenses reasonably necessary for the preparation of termination settlement proposals and supporting data; (ii) for the termination and settlement of subcontracts (excluding the amounts of such settlements); and (iii) storage, transportation, and other costs incurred, reasonably necessary for the preservation, protection, or disposition of the termination inventory; provided, however, that if the termination is for default, no amounts for the preparation of the Contractor's termination settlement proposal may be included.
 - (4) A portion of the fee payable under the Contract, determined as follows:
 - (A) If the Contract is terminated for the convenience of the Institute or the Government, the settlement shall include a percentage of the fee equal to the percentage of completion of work contemplated under the Contract, but excluding subcontract effort included in subcontractors' termination proposals, less previous payments for fee.
 - (B) If the Contract is terminated for default, the total fee payable shall be such proportionate part of the fee as the total number of articles (or amount of services) delivered to and accepted by JPL is to the total number of articles (or amount of services) of a like kind required by the Contract.
 - (5) If the settlement includes only fee, it will be determined under subparagraph (h)(4) above.
- (i) The cost principles and procedures in Part 31 of the FAR and any corresponding implementing or supplementing provisions in the NFS, in effect on the date of this Contract, shall govern all costs claimed, agreed to, or determined under this Article.
- (j) The determination by JPL of the amount, if any, due the Contractor by reason of the termination of this Contract, as provided in paragraphs (f) or (h) above or paragraph (l) below of this Article, shall not be final and conclusive with regard to the Contractor's right to pursue any available legal remedy in the event the Contractor disagrees with such determination, provided that, if the Contractor has failed to submit its claim within the time provided in paragraph (f) above, and has failed to request an extension of such time, the determination of JPL as to the amount due shall be final and conclusive.
- (k) In arriving at the amount due the Contractor under this Article, there shall be deducted:
 - (1) All unliquidated advance or other payments to the Contractor, under the terminated portion of this Contract;
 - (2) Any claim which the Institute has against the Contractor under this Contract; and
 - (3) The agreed price for, or the proceeds of sale of materials, supplies, or other things acquired by the Contractor or sold under this Article and not recovered by or credited to the Institute.
- (l) The Contractor and the Institute must agree to any equitable adjustment in fee for the continued portion of the Contract when there is a partial termination and such adjustment shall be evidenced by a modification to this Contract.

- (m) (1) The Institute may, under the terms and conditions it prescribes, make partial payments and payments against costs incurred by the Contractor for the terminated portion of the Contract, if the Institute believes the total of these payments will not exceed the amount to which the Contractor will be entitled.
- (2) If the total payments exceed the amount finally determined to be due, the Contractor shall repay the excess to the Institute upon demand, together with interest computed at the rate established by the Secretary of the Treasury under 50 U.S.C. App. 1215(b)(2). Interest shall be computed for the period from the date the excess payment is received by the Contractor to the date the excess is repaid to the Institute. Interest shall not be charged on any excess payment due to a reduction in the Contractor's termination settlement proposal because of retention or other disposition of termination inventory until 10 days after the date of the retention or disposition, or a later date determined by the Institute because of the circumstances.
- (n) The provisions of this Article relating to fee are inapplicable if this Contract does not include a fee.

TERMINATION OF DEFINED BENEFIT PENSION PLANS [CT, CREI – 4/99]

- (a) This Article is applicable if certified cost or pricing data is required or if any preaward or post-award cost determinations will be subject to FAR Part 31.
- (b) The Contractor shall promptly notify the JPL Negotiator in writing when it determines that it will terminate a defined benefit pension plan or otherwise recapture such pension fund assets. If pension fund assets revert to the Contractor or are constructively received by it under a termination or otherwise, the Contractor shall make a refund or give a credit to the Government for its equitable share as required by FAR 31.205-6(j)(4). The Contractor shall include the substance of this Article in all subcontracts under this Contract that meet the applicability requirement of FAR 15.408(g).

TOXIC CHEMICAL RELEASE REPORTING [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [FAR 52.223-14 – 10/96]

(This Article is applicable to all contracts where the value of the contract and all options at the time of award is expected to exceed \$100,000.)

By entering into this Contract, the Contractor agrees to abide by and accept all of the Terms and Conditions found in the Federal Acquisition Regulations (FAR) at 52.223-14.

TRANSFER OF TECHNICAL DATA UNDER SPACE STATION INTERNATIONAL AGREEMENTS [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI, A-E – 8/01] [NFS 1852.227-87 – 4/89]

(This Article applies to contracts and subcontracts in support of Space Station program activities that may involve transfer of technical data subject to the International Traffic in Arms Regulations, 22 CFR parts 120 through 130, or the Export Administration Regulations (EAR), 15 CFR PARTS 730-799 in accordance with the NASA Export Control Program.)

- (a) In the cooperative Space Station Freedom Program, NASA has the authority to provide to the international partners all information necessary to implement the multilateral Space Station Intergovernmental Agreement and the Space Station Memoranda of Understanding. NASA is committed under these Space Station agreements to provide its international Space Station partners with certain technical data which are subject to the U.S. export control laws and regulations. NASA will have obtained any necessary approvals from the Department of State for the transfer of any such technical data. Space Station contractors, acting as agents of NASA under the specific written direction of the Contracting Officer, or designated representative, require no other separate approval under the International Traffic in Arms Regulations (ITAR).
- (b) The Contractor agrees, when specifically directed in writing by the JPL Negotiator or an authorized JPL representative under this Contract, acting upon the written direction of the NASA Contracting Officer or designated representative, to transfer identified technical data to a named foreign recipient, in the manner directed. No export control marking should be affixed to the data unless so directed. If directed, the text of the marking to be affixed will be furnished by NASA through the JPL Negotiator or an authorized JPL representative under this Contract.
- (c) It should be emphasized that the transfer is limited solely to those technical data which NASA specifically identifies and directs the Contractor to transfer in accordance with paragraph (b), above, and that all other transfers of technical data to foreign entities are subject to the requirements of the U.S. export control laws and regulations.

- (d) Nothing contained in this Article affects the allocation of technical data rights between NASA and the Contractor or any subcontractors as set forth in the "Rights in Data" Article of this Contract, nor the protection of any proprietary technical data which may be available to the Contractor or any subcontractor under that Article.
- (e) The Contractor agrees to include this Article, including this paragraph (e), in all subcontracts hereunder, appropriately modified to reflect the relationship of the parties.

UNION DATA FOR ON-SITE CONTRACTORS [CT, FR-NR&D, FR-R&D, T&MC, LH-T&M – 2/00]

(This Article applies [i] to any time-and-material or labor-hour contract where the work is performed at a JPL-controlled facility and [ii] to any other contract for which any contractor personnel work in residence at a JPL-controlled facility. Work performed outside the United States is exempt from the requirements of this Article.)

The Contractor shall provide JPL-requested union information, including union information pertaining to its Subcontractors, if any, on the "Request for Union Data Regarding On-Site Contractors and Their Subcontractors," set forth below. A copy of this form (sample shown below), filled in, shall be returned to the cognizant negotiator's attention. Any changes in the data, such as the addition of a new union subcontractor, shall be provided to JPL through timely resubmission of the following form:

REQUEST FOR UNION DATA REGARDING ON-SITE CONTRACTORS AND THEIR SUBCONTRACTORS

1. Date:
2. Contract number:
3. Scheduled Contract completion date:
4. Contractor name:
5. Total number of on-site personnel:
6. Cognizant Negotiator:
7. Subcontractors under this Contract with union personnel working on-site at JPL-controlled facilities.

Number of Subcontractor Personnel at JPL Site:

- | <u>Subcontractor</u> | <u>Total Personnel</u> | <u>No. of Union Personnel</u> |
|---|------------------------|-------------------------------|
| 8. Brief description of scope of work and location of work site sufficient to locate the union contract and subcontract workers. | | |
| 9. a. Local union name: | | Local No. (if any): |
| b. Number of on-site Contractor/subcontractor personnel represented: | | |
| c. Name, phone number and address of business agent representing the local union: | | |
| (1) Name: | | |
| (2) Phone: | | |
| (3) Address: | | |
| d. Expiration date of labor agreement: | | |
| e. (1) If applicable, the employer association responsible for negotiating each agreement for Contractor/subcontractor: | | |
| (2) If applicable, the names of Contractor's/subcontractor's local employer representatives who take part in such negotiations: | | |
| 10. Name, phone number and address of the Contractor's subcontractor's representative who is responsible for handling labor relations/human resources issues: | | |
| a. Name: | | |
| b. Phone: | | |
| c. Address: | | |

(Note: For items 8., 9., and 10., provide for each union and also for each on-site subcontract, as applicable.)

USE OF RURAL AREA SMALL BUSINESSES [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI – 2/00] [NFS 1852.219-74 – 9/90]

(Work performed outside the United States is exempt from the requirements of this Article.)

Incorporate by reference NFS 1852.219-74, Use of Rural Area Small Businesses.

UTILIZATION OF SMALL, SMALL DISADVANTAGED, AND WOMEN-OWNED SMALL BUSINESS CONCERNS

[CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI – 4/99] [FAR 52.219-8 – 6/97]

(This Article is applicable when the Contract amount is expected to be over \$100,000, unless (i) a personal services contract is contemplated, (ii) a commercial items or services contract, or (iii) the Contract together with all its subcontracts is to be performed entirely outside of any State, territory, or possession of the United States, the District of Columbia, and the Commonwealth of Puerto Rico.)

Incorporate by reference FAR 52.219-8, Utilization of Small, Small Disadvantaged, and Women-Owned Small Businesses.

YEAR 2000 COMPLIANCE REQUIREMENT - NEW WORK [CT, FP-NR&D, FP-R&D, T&MC, LH/T&M, FPC, CREI, A-E – 4/99] [PIC 98-8 - 5/21/98]

(This provision is not applicable to contracts \$2,500 or less.)

The Statement of Work includes the following performance requirements:

- (a) **Definition.** "Year 2000 compliant," as used in this provision, means that the information technology (hardware, software and firmware, including embedded systems or any other electro-mechanical or processor-based systems used in accordance with its associated documentation) accurately processes date and date-related data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, and, to the extent that other information technology, used in combination with the information technology being acquired, properly exchanges date and date-related data with it.
- (b) (1) Any information technology provided, operated and/or maintained under this Contract is required to be Year 2000 compliant. To ensure this result, the Contractor shall provide documentation describing how the IT items or services demonstrate Year 2000 compliance, consisting of standard product literature or test reports for commercial items, test procedures, or other documentation, if any, otherwise specifically required in paragraph (b)(2).
- (2) (RESERVED)
- (c) The Contractor warrants that any IT items or services provided under this Contract that involve the processing of date and date-related data are Year 2000 compliant. If the Contract requires that specific listed products must perform as a system in accordance with the foregoing warranty, then that warranty shall apply to those listed products as a system.
- (d) The remedies available under this warranty shall include repair or replacement, at no additional cost to JPL (or if this is a cost-reimbursement contract, at no additional fee to JPL) and the Government, of any provided items or services whose non-compliance is discovered and made known to the Contractor in writing within 90 days after acceptance. In addition, all the other terms and limitations of the Contractor's standard commercial warranty or warranties shall be available to JPL for the IT items or services acquired under this Contract. Nothing in this warranty shall be construed to limit any rights or remedies JPL may otherwise have under this Contract with respect to defects other than Year 2000 performance.
- (e) (RESERVED)

MANAGEMENT OF GOVERNMENT PROPERTY IN THE POSSESSION OF CONTRACTORS

- (a) Scope. This document prescribes the minimum requirements contractors must meet in establishing and maintaining control over Government property. It applies to contractors organized for profit and, except as otherwise noted, to nonprofit organizations. In order for the special requirements in this document governing nonprofit organizations to apply, the Contract must identify the Contractor as a nonprofit organization. If there is any inconsistency between this document and the terms of the Contract under which the Government property is provided, the terms of the Contract shall govern. JPL's Contractors are to respond to JPL as the prime contractor. All NASA directives do not necessarily apply to JPL. Specifically, directives pertaining to the use of NEMS tags and the NASA Form 1018 reporting period.
- (b) Definitions.
- (1) "Accessory item," as used in this document, means an item that facilitates or enhances the operation of plant equipment but which is not essential for its operation.
 - (2) "Agency-peculiar property," as used in this document, means Government-owned personal property that is peculiar to the mission of NASA (e.g., space property). It excludes Government material, special test equipment, special tooling, and facilities.
 - (3) "Auxiliary item," as used in this document, means an item without which the basic unit of plant equipment cannot operate.
 - (4) "Centrally reportable equipment," as used in this document, means that plant equipment, special test equipment (including components), special tooling, and non-flight space property (including ground support equipment) which is (i) generally commercially available and used as a separate item or component of a system, (ii) is valued at \$1,000 or more, and (iii) is identifiable by a manufacturer and model number.
 - (5) "Contractor-acquired property," as used in this document, means property acquired or otherwise provided by the Contractor for performing a contract with JPL and to which the Government has title.
 - (6) "Custodial records," as used in this document, means written memoranda of any kind, such as requisitions, issue hand receipts, tool checks, and stock record books, used to control items issued from tool cribs, tool rooms, and stockrooms.
 - (7) "Discrepancies incident to shipment," as used in this document, means all deficiencies incident to shipment of Government property to or from a contractor's facility whereby differences exist between the property purported to have been shipped and property actually received. Such deficiencies included loss, damage, destruction, improper status and condition coding, errors in identity or classification, and improper consignment.
 - (8) "Facilities," as used in this document, means property used for production, maintenance, research, development, or testing. It includes plant equipment and real property. It does not include material, special test equipment, special tooling, or agency-peculiar property.
 - (9) "Government property," as used in this document, includes JPL-furnished, Government-owned property and contractor-acquired property.
 - (10) "Government-furnished property (GFP)," as used in this document, means JPL-furnished, Government-owned property in the possession of or directly acquired by the Government and subsequently made available by JPL to the Contractor.
 - (11) "Individual item record," as used in this document, means a separate card, form, document or specific line(s) of computer data used to account for one item of property.
 - (12) "Material," as used in this document, means property that may be incorporated into or attached to a deliverable end item or that may be consumed or expended in performing a contract. It includes assemblies, components, parts, raw and processed materials, and small tools and supplies that may be consumed in normal use in performing a contract.
 - (13) "Nonprofit organization," as used in this document, means any corporation, foundation, trust, or institution operated for scientific, educational, or medical purposes, which is not organized for profit, and from which no part of the net earnings inures to the benefit of any private shareholder or individual.

- (14) "Plant equipment," as used in this document, means personal property of a capital nature (including equipment, machine tools, test equipment, furniture, vehicles, and accessory and auxiliary items) for use in manufacturing supplies, in performing services, or for any administrative or general plant purpose. It does not include special tooling or special test equipment.
 - (15) "Property Administrator," as used in this document, means an authorized representative of the Contracting Officer or an authorized representative of JPL assigned to administer the contract requirements and obligations relating to Government property.
 - (16) "Real property," as used in this document, means land and rights in land, ground improvements, utility distribution systems, and buildings and other structures. It does not include foundations and other work necessary for installing special tooling, special test equipment, or plant equipment.
 - (17) "Salvage," as used in this document, means property that, because of its worn, damaged, deteriorated, or incomplete condition or specialized nature, has no reasonable prospect of sale or use as serviceable property without major repairs, but has some value in excess of its scrap value.
 - (18) "Scrap," as used in this document, means personal property that has no value except for its basic material content.
 - (19) "Space property," as used in this document, means personal property which is peculiar to aeronautical and space programs of NASA and is not otherwise included in the categories of property in FAR 45.501 and any corresponding supplementing provisions of the NASA FAR SUPPLEMENT (NFS). It includes such items as aircraft, engines, space vehicles, and other similar components and related support equipment. The term "space property" is synonymous with the term "agency-peculiar property," as defined in paragraph (a)(2) above.
 - (20) "Special test equipment," as used in this document, means either single or multipurpose integrated test units engineered, designed, fabricated, or modified to accomplish special purpose testing in performing a contract. It consists of items or assemblies of equipment that are interconnected and interdependent so as to become a new functional entity for special testing purposes. It does not include material, special tooling, facilities (except foundations and similar improvements necessary for installing special test equipment), and plant equipment items used for general plant testing purposes.
 - (21) "Special tooling," as used in this document, means jigs, dies, fixtures, molds, patterns, taps, gauges, other equipment and manufacturing aids, all components of these items, and replacements of these items, which are of such a specialized nature that without substantial modification or alteration their use is limited to the development or production of particular supplies or parts thereof or to the performance of particular services. It does not include consumable property, material, special test equipment, facilities (except foundations and similar improvements necessary for installing special tooling), general or special machine tools, or similar capital items.
 - (22) "Stock record," as used in this document, means a perpetual inventory record which shows by nomenclature the quantities of each item received and issued and the balance on hand.
 - (23) "Utility distribution system," as used in this document, includes distribution and transmission lines, substations, or installed equipment forming an integral part of the system by which gas, water, steam, electricity, sewage, or other utility services are transmitted between the outside building or structure in which the services are used and the point of origin, disposal, or connection with some other system. It does not include communication services.
 - (24) "Work-in-process," as used in this document, means material that has been released to manufacturing, engineering, design or other services under the contract and includes undelivered manufactured parts, assemblies, and products, either complete or incomplete.
- (c) Contractor Responsibility.
- (1) The Contractor is directly responsible and accountable for all Government property in accordance with the provisions of this Contract. This includes Government property in the possession or control of a subcontractor. The Contractor shall establish and maintain a system in accordance with this document to control, protect, preserve, and maintain all Government property. This property control system shall be in writing unless the Property Administrator determines that maintaining a written system is unnecessary. The system shall be reviewed and, if satisfactory, approved in writing by the property administrator.

- (2) The Contractor shall maintain and make available the records required by this document and account for all Government property until relieved of that responsibility. The Contractor shall furnish all necessary data to substantiate any request for relief from responsibility.
- (3) (A) The Contractor shall be responsible for the control of Government property hereunder upon:
- (i) Delivery by JPL of GFP into its custody or control;
 - (ii) Delivery, when property is purchased by the Contractor and the Contract calls for reimbursement by JPL (this requirement does not alter or modify contractual requirements relating to passage of title).
 - (iii) Approval of its claim for reimbursement by JPL or upon issuance for use in Contract performance, whichever is earlier, of property withdrawn from Contractor-owned stores and charged directly to the Contract. This is not applicable to fixed-price contracts);
 - (iv) Acquisition by the Government of title to property pursuant to specific contractual provisions, or as a result of termination of a contract, or change orders issued under a contract. For purposes of property control, such property shall, unless otherwise provided by the Contract, be considered Government property upon acceptance of title by JPL.
- (B) Property to which the Government has acquired a lien or title solely as a result of advance, progress, or partial payments is not subject to the requirements of this document.
- (4) The Contractor shall require subcontractors that are provided Government property under this Contract to comply with the requirements of this document. Procedures for assuring subcontractor compliance shall be included in the Contractor's property control system.
- (5) If the property administrator finds any portion of the Contractor's property control system to be inadequate, the Contractor must take any necessary corrective action before the system can be approved. If the Contractor and property administrator cannot agree regarding the adequacy of control and corrective action, the matter shall be referred to the Contracting Officer.
- (6) The Contractor shall promptly report all Government property in excess of the amounts needed to complete full performance under this Contract.
- (7) When unrecorded Government property is found, both the cause of the discrepancy and actions taken or needed to prevent recurrence shall be determined and reported to the property administrator.
- (d) Receipts for Government Property. Receipts for Government property shall comply with the instructions for preparation of NASA Form 1018, Report of Government-Owned/Contractor-Held Property (see NFS 18-45.7101).
- (e) Discrepancies Incident to Shipment
- (1) GFP. If overages, shortages, or damages are discovered upon receipt of GFP, the Contractor shall provide a statement of the condition and apparent causes to the property administrator and to JPL. Only that quantity of property actually received will be recorded on the official records.
 - (2) Contractor-acquired property. The Contractor shall take all actions necessary in adjusting overages, shortages, or damages in shipment of Contractor-acquired property from a vendor or supplier. However, when the shipment has moved by Government bill of lading and carrier liability is indicated, the Contractor shall report the discrepancy in accordance with paragraph (1) above.
- (f) The policy on the provision of Government property (both Government-furnished and contractor acquired) is prescribed in FAR 45.102 and NFS 18-45.102.
- (g) GFP. JPL will describe all GFP in the Contract Schedule or specifications, regardless of property category. Additional GFP must be described in a modification to the Contract. Furthermore, to obtain additional Government-furnished facilities, the Contractor must submit a written statement prescribed by FAR 45-302.1(a)(4) and any corresponding supplementing provisions of the NFS.
- (h) Contractor-Acquired Property. The acquisition (and fabrication) of Government property is subject to the following conditions, depending on category of property:
- (1) Centrally Reportable Equipment Not Otherwise Identified (unless for incorporation into flight qualified or flight monitoring deliverable end items).
 - (A) The Contractor shall provide JPL, at the earliest possible date, a detailed listing of requirements for screening of existing Government inventories. DD Form 1419, DOD Industrial Plant Equipment Requisition, will be prepared for each item of centrally reportable equipment to be acquired and

forwarded to JPL for screening of the NASA Equipment Management System and other Government-available-equipment list for each item required, at least 30 days prior to beginning fabrication of or placement of a purchase order or subcontract for such equipment. In the event a certificate of non-availability is not received within such period, the Contractor may proceed to acquire the equipment or components, subject to any other applicable provisions of this Contract.

(B) Instructions for preparing the DD Form 1419 are contained in NFS 18-45.7103.

(C) See page 8(q)(1) DD Form 1342 (DOD Property Record) for reporting property acquisitions.

(2) Facilities.

(A) Prior JPL approval, if not already described in a contract Schedule as Contractor acquired.

(B) Submission of DD Form 1419, "DOD Industrial Plant Requisition," and return of Certificate of Nonavailability if it qualifies as Centrally Reportable Equipment (CRE).

(C) Submission of a written statement prescribed by FAR 45.302-1(a)(4) and any corresponding supplementing provisions of the NFS.

(3) Material. If a subcontracts clause is part of the Contract, advance notification to JPL and JPL consent as may be required by that clause.

(4) Agency Peculiar.

(A) If a subcontracts clause is part of the Contract, advance notification to JPL and JPL consent as may be required by that clause.

(B) Submission of DD Form 1419 and return of Certificate of Nonavailability if it (or any component) qualifies as CRE.

(5) Special tooling.

(A) If a "Subcontracts" clause is part of the Contract, advance notification to JPL and JPL consent as may be required by that clause.

(B) If a fixed-price contract, submission of the list to JPL within 60 days after delivery of the first production end items (or later as prescribed by JPL) unless already identified in the solicitation.

(C) Submission of DD Form 1419 and return of Certificate of Nonavailability if it (or any component) qualifies as CRE.

(6) Special test equipment.

(A) JPL approval 30 days in advance if not identified in the Contract (on negotiated procurements).

(B) Submission of DD Form 1419 and return of Certificate of Nonavailability if it (or any component) qualifies as CRE.

(i) Relief from Responsibility.

(1) Unless the Contract or JPL provides otherwise, the Contractor shall be relieved of property control responsibility for Government property by:

(A) Reasonable and proper consumption of property in the performance of the Contract as determined by the Property Administrator or JPL;

(B) Retention by the Contractor, with the approval of JPL and the Contracting Officer, of property for which the Government has received consideration;

(C) The authorized sale of property, provided the proceeds are credited to the Contract amount or paid in such a manner as JPL and the Contracting Officer may direct;

(D) Shipment from the Contractor's plant, under JPL's and the Government's instructions, except when shipment is to a subcontractor or other location of the Contractor; or

(E) A determination by JPL and the Contracting Officer of the Contractor's liability for any property that is lost, damaged, destroyed, or consumed in excess of that normally anticipated in a manufacturing or processing operation, if:

(i) The determination is furnished to the Contractor in writing;

- (ii) JPL is reimbursed where required by the determination; and
 - (iii) Property rendered unserviceable by damage is properly disposed of, and the determination is cross-referenced to the shipping or other documents evidencing disposal.
- (2) Nonprofit organizations are relieved of responsibility for Government property when title to the property is transferred to the Contractor.
- (j) Contractor's Liability.
 - (1) Subject to the terms of the Contract and the circumstances surrounding the particular case, the Contractor may be liable for shortages, loss, damages, or destruction of Government property. The Contractor may also be liable when the use or consumption of Government property unreasonably exceeds the allowances provided for by the Contract, the bill of material, or other appropriate criteria.
 - (2) The Contractor shall report in writing all cases of loss, damage, or destruction of Government property in its possession or control to the property administrator and JPL as soon as such facts become known. A written report shall also be furnished when completed and accepted products or end items are lost, damaged, or destroyed while in the Contractor's possession or control.
 - (3) The Contractor shall require any of its subcontractors possessing or controlling Government property accountable under the Contract to investigate and report all instances of loss, damage, or destruction of such property.
- (k) Records and Reports of Government Property.
 - (1) The Contractor's property control records shall constitute the Government's and JPL's official property records unless an exception has been authorized. The Contractor shall establish and maintain adequate control records for all Government property, including property provided to and in the possession or control of a subcontractor. The property control records specified in this section are the minimum required by the Government and JPL. Unless the property administrator or JPL directs otherwise, when a subcontractor has an approved property control system for Government property provided under its own prime contracts, the Contractor shall use the records created and maintained under that system.
 - (2) The Contractor's property control system shall provide financial accounts for Government-owned property in the Contractor's possession or control. The system shall be subject to internal control standards and be supported by property records for such property.
 - (3) Official records must identify all Government property and provide a complete, current, auditable record of all transactions. The records shall be safeguarded from tampering or destruction. Records shall be accessible to authorized Government and JPL personnel.
 - (4) Separate property records for each contract are desirable, but a consolidated property record may be maintained if it provides the required information.
 - (5) Special tooling and special test equipment fabricated from materials that are the property of the Government shall be recorded as Government-owned immediately upon fabrication. Special tooling and special test equipment fabricated from materials that are the property of the Contractor shall be recorded as Government property at the time title passes to the Government upon acceptance by JPL.
 - (6) Property records of the type established for components acquired separately shall be used for serviceable components permanently removed from items of Government property as a result of modification.
 - (7) The Contractor's property control system shall contain a system or technique to locate any item of Government property within a reasonable period of time.
- (l) Basic Information. Unless summary records are used as authorized under paragraph (p)(1) below, the Contractor's property control records shall provide the following basic information for every item of Government property in the Contractor's possession, regardless of value (other sections in this document require additional information for specific categories of Government property):
 - (1) The name, description (model number, manufacturer, serial number), National Stock Number (if furnished by the Government or available in the property control system) and property identification number;
 - (2) Acquisition date;
 - (3) Quantity received (or fabricated), issued, and on hand;
 - (4) Unit price (and unit of measure);

- (5) This Contract or Purchase Order number;
 - (6) Location;
 - (7) Disposition; and
 - (8) Posting reference and date of transaction.
- (m) Records of Pricing Information.
- (1) Requirement for unit prices.
 - (A) The Contractor's property control system shall contain the unit price for each item of Government property except as provided in (2) below. When a contractor records the unit price of property on other than the quantitative inventory records, those supplementary records shall become part of the property records.
 - (B) (Note: This paragraph (B) does not apply to nonprofit organizations.) The requirement that unit prices be contained in the official property records does not apply to those separate property records located at a contractor's sites and subcontractor plants; provided, that:
 - (i) Records maintained by the contractor at its primary site include unit prices; and
 - (ii) The contractor agrees to furnish actual or estimated unit prices to the secondary site or subcontractor as the need arises.
 - (C) When definite information as to unit price cannot be obtained, reasonable estimates will be used.
 - (2) Determining unit price.
 - (A) Contractor-acquired and contractor-fabricated property. Except for items fabricated by nonprofit organizations for research and development purposes, the unit price of contractor-acquired and contractor-fabricated property shall be determined in accordance with the system established by the Contractor in conformance with appropriately applied accounting principles as described in Section 31 of the FAR and any corresponding implementing or supplementing provisions in the NFS. Generally, separate unit prices should be applied to items of special tooling and special test equipment fabricated or acquired by the Contractor. However, if the Contractor's accounting system is acceptable, and if maintaining detailed cost records results in excessive accounting cost or is otherwise impracticable, group pricing may be used for special tooling, special test equipment, and work-in-process in accordance with the Contractor's acceptable cost accounting system. All processed material, fabricated parts, components, and assemblies charged to the Contractor's work-in-process inventory, including items in temporary storage while awaiting processing, may be considered as work-in-process for this purpose.
 - (B) GFP. The Government or JPL shall determine and furnish to the Contractor the unit price of GFP. Transportation and installation costs shall not generally be considered as part of the unit price for this purpose. Normally, the unit price of Government-furnished property will be provided on the document covering shipment of the property to the Contractor. In the event the unit price is not provided on the document covering shipment of the property to the Contractor, the Contractor will request it from JPL.
- (n) Records of Material.
- (1) General. All Government material furnished to the Contractor, as well as other material to which title has passed to the Government by reason of allocation from Contractor-owned stores or purchase by the Contractor for direct charge to a JPL contract, shall be recorded in accordance with the Contractor's approved property control system and the requirements of this section.
 - (2) Consolidated stock record. When a contractor has more than one JPL contract under which Government material is provided, a consolidated record for materials may be authorized by the property administrator, provided, the total quantity of any item is allocated to each contract by contract number and each requisition of material from contractor-owned stores is charged to the contract on which the material is to be used. The supporting document or issue slip shall show the contract number or equivalent code designation to which the issue is charged.
 - (3) Custodial records. The Contractor shall maintain custodial records for tool crib items, guard force items, protective clothing, and other items issued to individuals for use in their work.
 - (4) Use of receipt and issue documents. (Note: This paragraph (4) does not apply to nonprofit organizations.) The property administrator may authorize the Contractor to maintain, in lieu of stock records, a file of appropriately cross-referenced documents evidencing receipt, issue, and use of Government-provided

material that is issued for immediate consumption and is not entered in the inventory as a matter of sound business practice. This method of control may be authorized for:

- (A) Material charged through overhead, including but not limited to items used in manufacturing, maintenance, and office supplies;
 - (B) Material under research and development contracts;
 - (C) Subcontracted or outside production items;
 - (D) Nonstock or special items (these items are considered to be those whose procurement cycle is irregular and infrequent);
 - (E) Items that are produced for direct charge to a contract, or are acquired and issued for installation upon receipt, and involve no spoilage; and
 - (F) Items issued from contractor-owned inventory direct to production or maintenance, etc.
- (5) Material issued directly upon receipt. (Note: This paragraph (5) applies only to nonprofit organizations.)
- (A) Under fixed-price contracts, the Contractor's documents evidencing receipt and issue will be accepted as property control records for Government-furnished material issued directly by the Contractor upon receipt so as to be considered consumed under the Contract.
 - (B) Under cost-reimbursement contracts, Government invoices, contractor's purchase documents, or other evidence of acquisition and issue will be accepted as adequate property records for material furnished to or acquired by the Contractor and issued directly so as to be considered consumed under the Contract.
- (o) Records of Special Tooling and Special Test Equipment. (Note: The special tooling requirements of this section (o) do not apply to nonprofit organizations except for paragraph (3).)
- (1) The Contractor's property control system shall provide the basic information listed in section (l) above regarding each item of Government-owned special tooling and special test equipment, including any general purpose test equipment incorporated as components in such a manner that removal and reuse may be feasible and economical.
 - (2) If the Contractor uses group pricing of special tooling or special test equipment, as recognized in paragraph (m)(2) above, unit prices may be computed when required.
 - (3) In the case of special tooling acquired or fabricated by nonprofit organizations or furnished by JPL or the Government to nonprofit organizations for research and development, the Contract document will be accepted as adequate property control records.
 - (4) Records identifying special tooling and special test equipment shall include the identification number and item on which used.
 - (5) The Contractor shall, when specified by the Contract, identify and report special tooling and special test equipment by retention category (e.g., assembly tooling or critical tooling for spares or replacements).
- (p) Records of Plant Equipment
- (1) The Contractor shall maintain individual item records for each item of plant equipment having a unit cost of \$5,000 or more. Summary stock records may be maintained for plant equipment costing less than \$5,000 per unit, except when the Property Administrator or JPL determines that individual item records are necessary for effective control, calibration, or maintenance.
 - (2) In addition to the information required in section (l) above, the Contractor's records of Government-owned plant equipment, regardless of value, shall include:
 - (A) Federal Supply Code for the manufacturer (as listed in Cataloging Handbook H4-1 and H4-2) (available from the Superintendent of Documents, Government Printing Office (GPO), Washington, DC 20402);
 - (B) Federal Supply Classification (Cataloging Handbooks H2-1, H2-2, and H2-3) (available from GPO);
 - (C) The original manufacturer's model or part number.
 - (3) For each item of Government-owned plant equipment having a unit cost of \$5,000 or more, the Contractor shall, in addition to the requirements of (2) above, include:
 - (A) Serial number and year built (when available);

- (B) Government identification/tag number; and
- (C) Acquisition and disposition document references and dates.
- (4) JPL may unilaterally determine that the information in paragraph (3)(A) and (B) above should be recorded in the property records for plant equipment costing less than \$5,000.
- (5) Accessory and auxiliary equipment shall be recorded on the record of the associated item of plant equipment. If the accessory or auxiliary item is not attached to, a part of, or acquired for use with a specific item of plant equipment, it shall be recorded either in an individual item record or in a summary stock record. When accessory and auxiliary items are permanently separated from the basic item of plant equipment, the unit price of the basic item shall be appropriately reduced.
- (q) Special Reports of Government Property (Reporting Centrally Reportable Equipment).
 - (1) JPL requires that Contractor-acquired equipment as defined in (b)(4) above, "Centrally Reportable Equipment," be reported to JPL. A DD Form 1342, "DOD Property Record," shall be submitted (i) at the time of receipt and acceptance of accountability, and (ii) when major changes occur in the data initially submitted to JPL.
 - (2) The Contractor shall report excess Government property to JPL on Inventory Schedules (Standard Forms 1426-1434) when the property is no longer required for contract performance. (Reference paragraph (dd)(4)(A) of this form.)
 - (3) Each year the Contractor will be provided a verification listing of property accountable to the Contract. At the direction of JPL, the Contractor shall verify the correctness of this listing or provide the necessary corrections.
- (r) Nonstandard Unique Equipment. For nonstandard unique equipment having a value of \$5,000 or more which is either fabricated by the Contractor or acquired from sources other than NASA or JPL, the Contractor shall provide the following information when such equipment becomes excess to the Contractor's needs:
 - (1) Nomenclature;
 - (2) Contractor-assigned identification number;
 - (3) A brief functional description, include sketches, schematics, performance characteristics, operational manuals, etc., if available;
 - (4) List of major components having a unit value of \$5,000 or more; and
 - (5) Cost.
- (s) Records of Real Property.
 - (1) The Contractor shall maintain an itemized record of the description, location, acquisition cost, and disposition of all Government real property (including unimproved real property); all alterations, all construction work, and sites connected with such alteration and construction, acquired by purchase, lease, or otherwise. These records, including maps, drawings, plans, specifications, and supplementary data where necessary, shall (i) be complete, (ii) show the original cost of the property and improvements and the cost of any changes and additions, and (iii) be appropriately indexed.
 - (2) Costs incurred by the Contractor or JPL for new construction, including erection, installation, or assembly of real property in possession of the Contractor for JPL, shall be capitalized in the official Government real property records and financial accounts maintained by the Contractor for JPL.
 - (3) Costs incurred for additions, expansions, extensions, conversions, alterations, and improvements, including applicable portions of capital maintenance, that increase the value, life, utility, capability, or serviceability of Government real property shall be capitalized.
 - (4) Costs incurred for portable buildings or facilities specifically constructed for tests that involve destruction of the facility shall not be capitalized in the Government real property records or financial accounts.
 - (5) Costs incurred for maintenance, repair, or rearrangement to maintain the Government real property in good physical condition, utility, capacity, or serviceability shall be charged to expense, and the real property records shall not be affected.

- (6) When Government-owned real property is sold, transferred, donated, destroyed by fire or other cause, abandoned-in-place, or condemned, the financial accounts shall be reduced by the presently recorded cost and the real property records annotated with a supporting statement, including pertinent facts.
- (t) Records of Scrap or Salvage.
- (1) The Contractor shall maintain records of all scrap or salvage generated, except as provided in section (bb) below. These records shall conform to the Contractor's established system of scrap and salvage control approved by the property administrator, who shall take into consideration the need for protecting the Government's and JPL's interest in the proration, disposition, and allocation of proceeds resulting therefrom.
- (2) The Contractor's property control system shall provide the following information:
- (A) Contract or purchase order number, if practical, from which the scrap or salvage derived;
- (B) Nomenclature or description of salvable items or classification (material content) of scrap;
- (C) Quantity on hand;
- (D) Posting reference and date of transaction; and
- (E) Disposition, including record of JPL authorization.
- (u) Records of Related Data and Information. The Contractor shall maintain property control and accountability, in accordance with sound business practice, of manufacturing or assembly drawings; installation, operation, repair, or maintenance instructions; and other similar information furnished to the Contractor by the Government or JPL or generated or acquired by the Contractor under the Contract and for which title vests in the Government. The requirements of this document do not otherwise apply to such property.
- (v) Records of Completed Products. The Contractor shall maintain a record of all completed products produced under a contract as follows:
- (1) When there is no time lapse between JPL inspection and acceptance of the completed products and shipment from the plant site, the records shall, as a minimum, consist of a summary of quantities accepted and shipped. When end items are accepted by JPL and stored with the Contractor awaiting shipment, the record shall identify quantities stored, location, and disposition action.
- (2) On contracts that provide for the Contractor to retain completed products for further use under the Contract or other contracts, such items shall be considered "GFP" upon acceptance and shall be recorded as required by this section.
- (3) When completed products are returned to a contractor under the terms of a warranty clause, the contractor shall maintain, by contract, a record containing a description of the items involved, quantities received and returned to JPL, and other pertinent data necessary to determine that a proper accounting for all property has been made.
- (w) Records of Transportation and Installation Costs of Plant Equipment (Note: This section (w) does not apply to nonprofit organizations.)
- (1) Transportation costs.
- (A) The Contractor shall record within the property control system the transportation and installation costs directly borne by JPL for each item of Government-owned plant equipment with an acquisition cost of \$5,000 or more. The Contracting Officer through JPL may require the Contractor to provide such recorded costs for use in computing rental charges.
- (B) If transportation costs are not included in the price of equipment delivered, the Contractor shall contact the property administrator or JPL for instructions for obtaining applicable freight data.
- (2) Installation costs.
- (A) When the Contractor performs installation, the cost shall be computed in accordance with the Contractor's accounting system (if the system is acceptable for other Contract cost determination purposes) and recorded in the property record.
- (B) When installation is subcontracted, the Contractor shall record the cost paid to the subcontractor in the property record.
- (C) When installation costs are included in the price of equipment delivered to the using location, the property records should be so annotated.

- (x) Records of Misdirected Shipments. The Contractor's property control system shall provide the following information regarding each misdirected shipment of Government property received:
- (1) Identity of shipment, such as shipping document or bill of lading;
 - (2) Origin of shipment;
 - (3) Content (items in the shipment) per shipping documents, if available;
 - (4) Location; and
 - (5) Disposition.
- (y) Records of Property Returned for Rework.
- (1) The Contractor shall maintain quantitative records of property returned for processing to assure control from time of receipt through return of the items to JPL. The Contractor shall establish item records under its property control system and shall include the information required in section (l) above.
 - (2) The records shall specify the quantity of units returned to JPL and the quantity otherwise disposed of with proper authority.
- (z) Reports of Government Property.
- (1) Property accounts. The Contractor's property control system shall be such as to provide annually the total acquisition cost of Government property for which the Contractor is accountable in the following classifications in accordance with instructions in NFS 18-45.71:
 - (A) Land and rights therein;
 - (B) Buildings;
 - (C) Other structures and facilities;
 - (D) Leasehold improvements;
 - (E) Construction in progress;
 - (F) Equipment;
 - (G) Special test equipment;
 - (H) Special tooling;
 - (I) Agency peculiar;
 - (J) Material; and
 - (K) Contract work in process.
 - (2) Facilities, special tooling, equipment, and special test equipment. The Contractor's accounts covering items in paragraphs (1)(A) through (I) above will be susceptible to local reconciliation in totals and subtotals as to whether Contractor-acquired or Government-furnished.
 - (3) Agency-peculiar property. Includes actual or estimated costs of completed items, systems and subsystems, spare parts and components unique to NASA aeronautical and space programs. Examples include aircraft, engines, satellites, instruments, rockets, prototypes and mock-ups. The amount of property, title to which vests in the Government as a result of progress payments to fixed-price subcontractors, shall be included to reflect the pro rata cost of undelivered agency-peculiar property.
 - (4) Material and contract work in process. The Contractor's property control system shall be such as to provide the dollar value of items in paragraphs (1) (J) and (K) above for which it is accountable, regardless of value. Includes the costs of all work-in-process and excludes the costs of completed items reported in other categories.
 - (5) Submission of reports. The Contractor shall submit a completed NASA Form 1018, "NASA Property in the Custody of Contractors," or equivalent, (or negative report) annually to JPL. Failure to submit the report when due (date to be determined by JPL) may be deemed noncompliance with contract requirements, and final payment may be withheld in accordance with the Article entitled "Allowable Cost and Payment."

(aa) Identification.

- (1) The Contractor shall identify, mark, and record all Government property promptly upon receipt, unless exempted by this section, and shall record assigned numbers on all applicable documents pertaining to the property control system. NASA NEMS tags shall be affixed to property as directed by JPL. Markings shall be removed or obliterated when Government property is sold, scrapped, or donated.
- (2) All Government material and plant equipment having an acquisition cost less than \$5,000 shall be identified as Government property except in those cases where:
 - (A) No material or plant equipment of the same type costing less than \$5,000 at the same location is owned by the Contractor or its employees.
 - (B) Adequate physical control is maintained over protective clothing, tool crib, guard force, and other items issued to individuals for use in their work;
 - (C) Property is of bulk type, or its general nature of packing or handling precludes adequate marking; or
 - (D) Property is commingled, as authorized by section (bb) below.
- (3) In accordance with procedures approved by JPL, the Contractor shall mark Government-owned special tooling and special test equipment with a serial number and identification number and an indication of NASA ownership, including the recognition that JPL is responsible for funding and control of the property when appropriate. NASA NEMS tags shall be affixed to property as directed by JPL. If marking will damage the equipment or is otherwise impracticable, the Contractor shall promptly report the problem to the property administrator. The Contractor shall mark in a manner similar to plant equipment all components of special test equipment that have an acquisition cost of \$5,000 or more and are incorporated in a manner that makes removal and reutilization feasible and economical.
- (4) The Contractor shall identify Government-owned plant equipment as such, unless (i) summary records are used as authorized under paragraph (p)(1) above, (ii) it is excluded under paragraph (aa)(2) above, or (iii) when the size or nature of the equipment makes identification impracticable. (Excepted items shall be entered and described on the equipment property record.) Property shall be identified by a legible, permanent, conspicuous, and tamper-proof method (e.g., decals, plates, stamping, etc.). Identification shall consist of a serial number and an indication of NASA ownership (unless already properly identified as NASA property). NASA NEMS tags shall be affixed to property as directed by JPL.
- (5) Accessory or auxiliary equipment associated with a specific item of plant equipment and recorded on the property records need not be marked with an identification number, unless necessary to assure its return with the associated basic item.

(bb) Segregation of Government Property. Government property shall be kept physically separate from Contractor-owned property. However, when advantageous to the Government or JPL and consistent with the Contractor's authority to use such property, the property may be commingled:

- (1) When the Government property is special tooling, special test equipment, or plant equipment clearly identified and recorded as Government property;
- (2) When approved by the property administrator in connection with research and development contracts;
- (3) When (i) scrap of a uniform nature is produced from both Government-owned and Contractor-owned material and physical segregation is impracticable, (ii) scrap produced from Government-owned material is insignificant in consideration of the cost of segregation and control, or (iii) Government contracts involved are fixed-price and provide for the retention of the scrap by the Contractor; or
- (4) When otherwise approved by the property administrator.

(cc) Physical Inventories. The Contractor shall periodically physically inventory all Government property (except materials issued from stock for manufacturing, research, design, or other services required by the Contract) in its possession or control and shall cause subcontractors to do likewise. Physical inventories consist of sighting, tagging or marking, describing, recording, reporting, and reconciling the property with the records. The Contractor, with the approval of JPL, shall establish the type, frequency, and procedures. Type and frequency of inventory should be based on the Contractor's established practices, the type and use of the Government property involved, or the amount of Government property involved and its monetary value, and the reliability of the Contractor's property control system. Type and frequency of physical inventories normally will not vary between contracts being performed by the Contractor, but may vary with the types of property being controlled. Personnel who perform the physical inventory shall not be the same individuals who maintain the property

records or have custody of the property unless the Contractor's operation is too small to do otherwise. JPL contractors shall complete reconciliations of inventories described in this section (cc) with the official property records and shall submit reports to the property administrator within 30 days after the completion of an inventory. All instances of loss of property and discovery of unrecorded property shall be investigated by the Contractor to determine (i) the cause of the discrepancy and (ii) actions needed to prevent recurrence of the discrepancy. It may be determined by the property administrator that JPL will perform the physical inventory.

(dd) Inventories upon Termination or Completion.

- (1) General. Immediately upon termination or completion of a contract, the Contractor shall perform and cause each subcontractor to perform a physical inventory, adequate for disposal purposes, of all Government property applicable to the contract, unless the requirement is waived as provided in paragraph (2) below.
- (2) Exception. The requirement for physical inventory at the completion of a contract may be waived by the property administrator when the property is authorized for use on a follow-on contract; provided, that:
 - (A) Experience has established the adequacy of property controls and an acceptable degree of inventory discrepancies; and
 - (B) The Contractor provides a statement indicating that record balances have been transferred in lieu of preparing a formal inventory list and that the Contractor accepts responsibility and accountability for those balances under the terms of the follow-on contract.
- (3) Listings for disposal purposes. (Note: This paragraph (3) applies only to nonprofit organizations.)
 - (A) Standard items that have been modified may be described on listings for disposal purposes as standard items with a general description of the modification.
 - (B) Items that have been fabricated, such as test equipment, shall be described in sufficient detail to permit a potential user to determine whether they are of sufficient interest to warrant further inspection.
- (4) Preparation of inventory schedule.
 - (A) Subsequent to termination or completion of this Contract, or determination that property is no longer required for contract performance, the Contractor shall prepare and submit to JPL appropriate inventory schedules as specified in FAR 45.606 and any corresponding supplementing provisions of the NFS (except that in FAR 45.606 the term "plant clearance officer" shall be deemed to mean "property administrator") which reflect all remaining property purchased, fabricated, or constructed with Contract funds and/or property supplied to the Contractor by JPL for the performance of this Contract. The schedules will reflect an appropriate nomenclature, description, quantity, acquisition cost, FSC (Federal Supply Classification), and condition code for each item of property.
 - (B) Inventory schedules shall be signed by an authorized representative of the Contractor, prior to submittal to JPL for disposal action.
 - (C) When no Government property has been furnished to or acquired by the Contractor under this contract, inventory schedules will not be required; instead, a properly completed Property Close-out Certificate, form JPL 0948 (see Exhibit 1), shall be submitted.
- (5) Disposition of residual property.
 - (A) Upon submittal of four executed copies of the appropriate inventory schedules to JPL, screening and disposal action will be initiated. Additional copies of the appropriate inventory schedules shall be furnished upon request.
 - (B) Disposition of residual property shall be made in accordance with specific instructions furnished by the Plant Clearance Officer or the JPL Property Administrator.
- (6) A Property Close-out Certificate, JPL form 0948, or equivalent shall be completed, signed by the Contractor's authorized representative and returned to JPL prior to final payment being effected.

(ee) Reporting Results of Inventories. The Contractor shall, as a minimum, submit the following to JPL promptly after completing the physical inventory:

- (1) A listing that identifies all discrepancies disclosed by a physical inventory;
- (2) A signed statement that physical inventory of all or certain classes of Government property was completed on a given date and that the official property records were found to be in agreement except for discrepancies reported.

- (ff) Quantitative and Monetary Control. When requested by JPL, the Contractor's reports of results of physical inventory shall be prepared on a quantitative and monetary basis and segregated by categories of property.
- (gg) Care, Maintenance, and Use. The Contractor shall be responsible for the proper care, maintenance, and use of Government property in its possession or control from the time of receipt until properly relieved of responsibility, in accordance with sound industrial practice and the terms of the Contract. The removal of Government property to storage, or its contemplated transfer, does not relieve the Contractor of these responsibilities.
- (hh) Contractor's Maintenance Program.
 - (1) Consistent with the terms of the Contract, the Contractor's maintenance program shall provide for:
 - (A) Disclosure of need for and the performance of preventive maintenance;
 - (B) Disclosure and reporting of need for capital rehabilitation; and
 - (C) Recording of work accomplished under the program.
 - (2) Preventive maintenance is maintenance performed on a regularly scheduled basis to prevent the occurrence of defects and to detect and correct minor defects before they result in serious consequences. An effective preventive maintenance program shall include at least:
 - (A) Inspection of buildings at periodic intervals to assure detection of deterioration and the need for repairs;
 - (B) Inspection of plant equipment at periodic intervals to assure detection of maladjustment, wear, or impending breakdown;
 - (C) Regular lubrication of bearings and moving parts in accordance with a lubrication plan;
 - (D) Adjustments for wear, repair, or replacement of worn or damaged parts and the elimination of causes of deterioration;
 - (E) Removal of sludge, chips, and cutting oils from equipment that will not be used for a period of time;
 - (F) Taking necessary precautions to prevent deterioration caused by contamination, corrosion, and other substances; and
 - (G) Proper storage and preservation of accessories and special tools furnished with an item of plant equipment but not regularly used with it.
 - (3) The Contractor's maintenance program shall provide for disclosing and reporting the need for major repair, replacement, and other capital rehabilitation work for Government property in its possession or control.
- (ii) Use of Government Property. The Contractor's procedures shall be in writing and adequate to assure that Government property will be used only for those purposes authorized in the Contract.
- (jj) Property in Possession of Subcontractors. The Contractor shall require any of its subcontractors possessing or controlling Government property to adequately care for and maintain that property and assure that it is used only as authorized by the Contract. The Contractor's approved property control system shall include procedures necessary for accomplishing this responsibility.
- (kk) Shipment of Government Property. Copies of DD Form 1149 or comparable documents shall be forwarded to the JPL Property Administrator upon shipment.
- (ll) Audit of Property Control System. The Contractor's Government property control system may be audited by the Government or JPL as frequently as conditions warrant. These audits may take place at any time during Contract performance, upon Contract completion or termination, or at any time thereafter during the period the Contractor is required to retain such records. The Contractor shall make all such records and related correspondence available to the auditors.

EXHIBIT 1

Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, California 91109-8099
(818) 354-4321



PROPERTY CLOSE-OUT CERTIFICATE

The undersigned Contractor, having completed the work called for by Contract No. _____
dated _____, with the California Institute of Technology, Jet Propulsion
Laboratory, certifies that:

(check one, as appropriate)

- ☐ All Government property (as defined in FAR 45.101) has been disposed of by the Contractor
and its subcontractors, in accordance with the terms of the Contract.
- ☐ No Government property was furnished to or acquired by the Contractor or its
subcontractors.

Contractor

Authorized Representative Signature

Date

Title

Jet Propulsion Laboratory
California Institute of Technology
4800 Oak Grove Drive
Pasadena, California 91109-8099
(818) 354-4321

RELEASE OF INFORMATION

This Contract with the Jet Propulsion Laboratory (JPL) constitutes a subcontract under a prime contract between the California Institute of Technology and the National Aeronautics and Space Administration (NASA). It is NASA's policy to provide the widest practical dissemination of information on all of its activities. Since 90% of NASA's research and development effort is performed by private industry, contractors and subcontractors have played a large role in this process.

In accordance with this policy, the Contractor may want to issue press releases or plan publicity and advertising from time to time, and the Contractor will be expected to respond to queries from information media.

Close coordination in all of these matters is required, and JPL requires that all materials (e.g., news and photo releases, exhibit copy, motion picture scripts, advertising copy) directly related to the Contractor's work with and for JPL be reviewed by JPL for technical accuracy prior to issuance or use.

To expedite this review, the Contractor shall send the materials to the JPL Media Relations Office, mail stop 186-120, stating the Contractor's deadlines and referencing this Contract number.

In the event this Contract is a cost-reimbursement type contract, review by JPL shall not constitute approval for reimbursement of expenditures made in connection with publicity or advertising releases. Any such expenditures remain subject to applicable cost principles.

Nothing contained herein shall be deemed to change existing requirements relating to the release of classified information.

AFFILIATE ACCESS REQUEST

Before a JPL Affiliate Badge can be issued to an affiliate for access to JPL facilities, this form must be completed by the person requiring access and submitted to JPL Security and Protective Services (M/S 310-129).

To allow for security processing, this form must be submitted at least 24 hours before the required access to JPL premises by the affiliate.

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Have you ever been convicted of a felony? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Have you ever been convicted of a misdemeanor which resulted in imprisonment? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. If you answered "Yes" to any of the above questions, please state the date, place, and circumstances. A conviction will not necessarily disqualify you from access to JPL premises. If you need additional space, please attach another sheet of paper. | | |

I certify that answers given herein are true and complete to the best of my knowledge, and I authorize investigation of all statements contained herein. I understand that misrepresentation or omission of facts could result in withdrawal or denial of access to JPL.

Date Signed

Signature of Affiliate Requesting Access

Required Access Date

Printed Name of Affiliate Requesting Access

Printed Name of Affiliate Sponsor



NOTIFICATION TO PROSPECTIVE CONTRACTORS OF JPL'S ETHICS POLICIES AND ANTI-KICKBACK HOT LINE

JPL is committed to conducting its business in accordance with the highest standards of ethics and integrity. In this regard, we have an on-going orientation and training program to assure that every JPL employee is aware of this commitment and their individual responsibility for compliance. We must rely on the personal integrity of our employees and the integrity and cooperation of our suppliers and contractors to make sure that these high standards are maintained.

The policies that implement our standards of business conduct state clearly that no employee may solicit or accept any "kickback," gift, gratuity, entertainment, compensation, or favors of any kind from any supplier/contractor or prospective supplier/contractor to JPL. Our policies make it clear that these standards not only apply to procurement personnel but also to employees in all functions and at all levels.

The purpose of this letter is to make sure that you and your employees are aware of our policies, and that together we can achieve and maintain excellence in the conduct of our business relationships.

In the unlikely event that any JPL employee ever attempts to solicit a "kickback," please notify us immediately. JPL has established an Anti-Kickback Hot Line number, (818) 354-9999. Please feel free to call this number collect. The information you provide will be handled with confidentiality, investigated thoroughly, and appropriate action taken.

Thank you for your cooperation and support in this important matter.



CERTIFICATIONS

(NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.)

I. CERTIFICATION OF NONSEGREGATED FACILITIES

- (a) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin, because of habit, local custom, or otherwise.
- (b) By the submission of an offer, the offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The offeror agrees that a breach of this certification is a violation of the Equal Opportunity clause in the contract.
- (c) By submission of the offer, the offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will:
 - (1) Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;
 - (2) Retain such certifications in its files; and
 - (3) Forward this certification and the following notice to the proposed subcontractors:

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATION OF NONSEGREGATED FACILITIES

A Certificate of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to the Equal Opportunity clause. The certification may be submitted either for each subcontractor for all subcontracts during a period (i.e., quarterly, semi-annually, or annually).

- (d) By commencing performance of the Contract work, the selected contractor certifies to the Nonsegregated Facilities provisions above.

II. CERTIFICATION OF ANTI-KICKBACK COMPLIANCE

(A Certification of Anti-Kickback Compliance must be submitted prior to award.)

By submission of an offer, the offeror certifies that it has read the General Provision entitled "Anti-Kickback Procedures," contained in the solicitation and that neither it nor any of its employees has performed or participated in any prohibited actions, as defined in that provision, relating to the award of the Contract. By commencing performance of the Contract work, the selected contractor certifies to Anti-Kickback Compliance.

III. CERTIFICATION OF AMERICANS WITH DISABILITIES ACT COMPLIANCE

(The Contractor represents and certifies the following as part of its offer.)

By submission of an offer, the offeror certifies that it complies with the Americans with Disabilities Act, 42 U.S.C., 12101 et. seq., and will maintain compliance throughout the life of this Contract. By commencing performance of the Contract work, the selected contractor certifies to the Americans with Disabilities Act compliance.

**IV. CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS
TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS**

(The following certification applies to all offers and awards in excess of \$100,000.)

- (a) The definitions and prohibitions contained in the General Provision Article "Limitation on Payments to Influence Certain Federal Transactions" are hereby incorporated by reference in paragraph (b) of this Certification.
- (b) By submission of an offer, the offeror certifies to the best of his or her knowledge and belief that on or after December 23, 1989:
 - (1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;
 - (2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the Offeror shall complete and submit, with its offer, OMB Standard Form LLL, "Disclosure of Lobbying Activities," to the JPL Contract Negotiator; and
 - (3) He or she will include the language of this Certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.
- (c) Submission of this certification and disclosure is a prerequisite for making or entering into this Contract imposed by Section 1352, Title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to civil penalty of not less than \$20,000 and not more than \$100,000, for each such failure.

**V. CERTIFICATION OF FULL DISCLOSURE BY THE CONTRACTOR/OFFEROR
REGARDING WHETHER IT ANTICIPATES BEING OR IS DEBARRED,
SUSPENDED, OR PROPOSED FOR DEBARMENT BY THE U.S. FEDERAL
GOVERNMENT AT TIME OF AWARD**

(This certification applies to contracts with a contract value exceeding \$25,000.)

- (a) By submission of an offer, the offeror certifies that it has provided full disclosure in writing to JPL whether as of the anticipated time of award of any contract resulting from the solicitation, it anticipates that it or its principals will be debarred, suspended, or proposed for debarment by the U.S. Federal Government.
- (b) By commencing performance of the Contract work, the selected contractor certifies that it has made full disclosure to JPL in writing as to whether as of the time of award it or any of its principals is debarred, suspended, or proposed for debarment by the U. S. Federal Government. (see FAR 9.404 for information on the List of Parties Excluded from Procurement Programs).

VI. CERTIFICATION OF TOXIC CHEMICAL RELEASE REPORTING

(This certification is required prior to award of a contract with an estimated value, including any options, over \$100,000.)

- (a) Submission of this certification is a prerequisite for making or entering into this Contract imposed by Executive Order 12969, August 8, 1995.
- (b) By submission of an offer, the offeror certifies that it has accepted and certifies to all the Terms and Conditions found in the Federal Acquisition Regulation (FAR) at 52.223-13.

VII. CERTIFICATION REGARDING CONTRACTOR REPRESENTATION BY FORMER CALTECH/JPL EMPLOYEES

(The Contractor represents and certifies the following as part of its offer.)

By submission of an offer, the offeror certifies that it has no previous JPL or Caltech employee involved in this procurement who has been gone from JPL for less than one year, who participated personally and substantially in the subject matter while working for JPL or Caltech, who was officially responsible for the subject matter while working for JPL or Caltech, and who owns or represents the proposer's organization.



ASBESTOS NOTIFICATION

The Jet Propulsion Laboratory is committed to providing a safe and healthy work environment for all personnel.

In the past several years, the Laboratory management, working through the JPL Safety Operations Section - Industrial Hygiene and Workers Compensation Group (SOS - IHWC) and the Facilities Division, has had an on-going program of asbestos identification and control. This program has included bulk sampling, air monitoring, and training for members of the Facilities and Maintenance staff.

Through this program, some of the buildings at JPL have been identified to contain friable sprayed-on fireproofing above the ceilings. At the Oak Grove site, these buildings include 167, 168, 169, 179, 180, 183, 186, 230, 238, 264 and 291, and at the Foothill site, buildings 502, 506 and 507. Asbestos may be present in other JPL buildings in other various forms, including, but not limited to: transite, thermal system insulation, roofing products, ceiling tiles, spray-applied acoustical ceiling, wall materials, and floor tiles/linoleum/mastic.

The majority of asbestos at JPL is located in restricted access areas, such as mechanical rooms, boiler rooms and attics. It is in generally good condition and does not pose a hazard during normal operations.

The SOS-IHAWC staff has taken numerous air samples in JPL buildings. Sampling results indicate that airborne asbestos levels in the buildings are well below regulatory limits and are lower than those found in industrial workplaces where adverse health effects have been observed. Fiber levels in JPL buildings are not significantly different than fiber levels found outside.

Asbestos-containing materials do not pose a health hazard, unless the fibers become airborne. Contractor maintenance/construction/renovation activity involving intentional or accidental contact with friable materials can release fibers; therefore, only authorized and properly trained personnel are permitted to perform work that may disturb asbestos materials.

General written procedures and handling restrictions have been provided to JPL and contractor personnel. SOS-IHAWC must be given notification and, if deemed necessary, a written description of any asbestos-related work to be conducted in areas where asbestos may be present prior to the initiation of activities. The work to be performed will determine if these areas must be tested and cleared. SOS-IHAWC will review sampling results and documentation after completion of contractor activities prior to occupancy.

Pursuant to the California Health and Safety Code (Chapter 10.4, Section 25915), each employee has the right to review all reports about surveys, bulk sampling and air sampling. These reports are available for review during normal business hours. Contact SOS-IHAWC at extension 4-1771 to review these documents or if there are any questions.

Notice of Potential Tax Withholding

JPL is legally obligated to withhold federal and/or state income tax from certain contractor and consultant payments when required by law. Withholding may be required under the following circumstances:

1. Nonresident Independent Contractor/Consultant State Source Income Tax

Payments made to California nonresident contractors or consultants, including sole proprietors, corporations, limited liability companies, and partnerships, that do not have a permanent place of business in CA, or that are not registered to do business in California, are subject to a seven percent state income tax withholding for services performed in California. No withholding is required on payments for goods, or for services performed outside California. See State Tax Form 587 (Nonresident Income Allocation Worksheet) and Form 590 (Withholding Exemption Certificate).

2. Nonresident (and Resident) Alien Federal Income Tax

Payments made to nonresident alien contractors/consultants are subject to a thirty percent federal income tax withholding for services performed in the U.S. unless an exception applies. A nonresident alien from a country with an income tax treaty with the United States may be exempt from tax under the Self-employment Article of the treaty if the individual satisfies the conditions of the treaty article. A nonresident alien from a non-treaty country may claim a daily personal exemption amount. Such nonresident aliens who have a U.S. taxpayer identification number (TIN) – either a U.S. Social Security Number or Individual Taxpayer Identification Number - can submit Federal Tax Form 8233 (Exemption From Withholding on Compensation for Independent Personal Services of a Nonresident Alien Individual) to claim a withholding reduction or exemption. No exemption is available for nonresident aliens who lack a TIN. Nonresident aliens not claiming such an exemption should submit Federal Form W-8BEN (Certificate of Foreign Status of Beneficial Owner for United States Tax Withholding). For more information, refer to IRS Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities.

Resident aliens should complete Federal Form W-9 (Payer's Request for Taxpayer Identification Number and Certification) to submit a U.S. taxpayer identification number. Resident aliens with no U.S. taxpayer identification number will be subject to back-up withholding, currently at a rate of twenty-five percent.

3. Federal or State Tax Liens or Levies

JPL may be required to withhold payments in an amount necessary to satisfy tax liens or levies or judgments duly issued against contractors or consultants by cognizant tax or judicial authorities.

Disclaimer: JPL is not liable for amounts incorrectly withheld. However, if JPL determines that amounts have been incorrectly withheld, and provided that such amounts have not been remitted to tax authorities, JPL shall refund such amounts to the contractor/consultant.

COST ACCOUNTING STANDARDS AND ADMINISTRATION OF COST ACCOUNTING STANDARDS

SECTION I - COST ACCOUNTING STANDARDS

- (a) Unless the Contract is exempt under 48 CFR, Subparts 9903.201-1 and 9903.201-2, the provisions of 48 CFR, Part 9903 are incorporated herein by reference and the Contractor, in connection with this Contract, shall:

- (1) (CAS-Covered Contracts Only) By submission of a Disclosure Statement, disclose in writing the Contractor's cost accounting practices as required by 48 CFR, Subpart 9903.202-1 through 9903.202-5, including methods of distinguishing direct costs from indirect costs and the basis used for allocating indirect costs. The practices disclosed for this Contract shall be the same as the practices currently disclosed and applied on all other contracts and subcontracts being performed by the Contractor and which contain a "Cost Accounting Standards" (CAS) provision. If the Contractor has notified the Contracting Officer that the Disclosure Statement contains trade secrets and commercial or financial information which is privileged and confidential, the Disclosure Statement shall be protected and shall not be released outside of the Government.

NOTE 1: Subcontractors shall be required to submit their Disclosure Statements to the Contractor. However, if a subcontractor has previously submitted its Disclosure Statement to a Government Administrative Contracting Officer (ACO), it may satisfy that requirement by certifying to the Contractor the date of the Statement and the address of the ACO.

NOTE 2: In any case where a subcontractor determines that the Disclosure Statement information is privileged and confidential and declines to provide it to the Contractor or higher tier subcontractor, the Contractor may authorize direct submission of that subcontractor's Disclosure Statement to the same Government offices to which the Contractor was required to make submission of its Disclosure Statement. Such authorization shall in no way relieve the Contractor of liability as provided in subparagraph (a)(5) of this Section.. In view of the foregoing and since the Contract may be subject to adjustment under this Article by reason of any failure to comply with rules, regulations, and Standards as specified in 48 CFR, Subpart 9903.3, and 48 CFR, Subpart 9904, and any corresponding implementing or supplementing provisions in the NFS, in connection with covered subcontracts, it is expected that the Contractor may wish to include a clause in each such subcontract requiring the subcontractor to appropriately indemnify the Contractor. However, the inclusion of such a clause and the terms thereof are matters for negotiation and agreement between the Contractor and the subcontractor, provided that they do not conflict with the duties of the Contractor under its Contract with the Institute. It is also expected that any subcontractor subject to such indemnification will generally require substantially similar indemnification to be submitted by its subcontractors.

NOTE 3: If a subcontractor is a business unit which, pursuant to 48 CFR Subpart 9903.201-2(b), is entitled to elect modified contract coverage and to follow Standard 9904.401 (Consistency in Estimating, Accumulating, and Reporting Costs) and Standard 9904.402 (Consistency in Allocating Costs Incurred for the Same Purpose), both of which standards are referenced in 48 CFR Subpart 9903.201-2(b), the clause at FAR 52.230-3, Disclosure and Consistency of Cost Accounting Practices, and the clause at FAR 52.230-6, Administration of Cost Accounting Standards, and any corresponding implementing or supplementing provisions in the NFS, shall be inserted in lieu of this Provision

- (2) Follow consistently the Contractor's cost accounting practices in accumulating and reporting Contract performance cost data concerning this Contract. If any change in cost accounting practices is made for the purposes of any contract or subcontract being performed by the Contractor and subject to CAS requirements, the change must be applied prospectively to this Contract and the Disclosure Statement must be amended accordingly. If the Contract price or cost allowance of this Contract is affected by such changes, adjustment shall be made in accordance with subparagraph (a)(4) or (a)(5) of this Section, as appropriate.
- (3) Comply with all CAS, including any modifications and interpretations indicated thereto contained in 48 CFR, Part 9904, in effect on the date of award of this Contract or, if the Contractor has submitted cost or pricing data, on the date of final agreement on price as shown on the Contractor's signed certificate of current cost or pricing data. The Contractor shall also comply with any CAS (or modifications to CAS) which hereafter become applicable to a contract or subcontract of the Contractor. Such compliance shall be required prospectively from the date of applicability to such contract or subcontract.

- (4) (A) Agree to an equitable adjustment as provided in the "Changes" Provision of this Contract if the Contract cost is affected by a change which, pursuant to subparagraph (a)(3) of this Section, the Contractor is required to make to the Contractor's established cost accounting practices;
- (B) Negotiate with the Government to determine the terms and conditions under which a change may be made to a cost accounting practice, other than a change made under other provisions of subparagraph (a)(4) of this Section; provided that no agreement may be made under this provision that will increase costs paid by the Institute.
- (C) When the parties agree to a change to a cost accounting practice, other than a change under subdivision (a)(4)(A) of this Section, negotiate an equitable adjustment as provided in the "Changes" Article of this Contract.
- (5) Agree to an adjustment of the Contract price or cost allowance, as appropriate, if the Contractor or a subcontractor fails to comply with an applicable Cost Accounting Standard, or to follow any cost accounting practice consistently and such failure results in any increased costs paid by the Institute. Such adjustment shall provide for recovery of the increased costs to the Institute, together with interest thereon computed at the annual rate established under section 6621 of the Internal Revenue Code of 1986 (26 U.S.C. 6621) for such period, from the time the payment by the Institute was made to the time the adjustment is effected. In no case shall the Institute recover costs greater than the increased cost to the Institute, in the aggregate, on the relevant contracts subject to the price adjustment, unless the Contractor made a change in its cost accounting practices of which it was aware or should have been aware at the time of price negotiations and which it failed to disclose to the Institute.
- (b) If the parties fail to agree whether the Contractor or a subcontractor has complied with an applicable Cost Accounting Standard in 48 CFR, Part 9904, or a CAS rule or regulation in 48 CFR, Part 9903, and as to any cost adjustment demanded by the United States, or by the Institute on behalf of the United States, the Contractor may, subject to the prior approval of the Institute, which approval will not be unreasonably withheld, process such disagreement as a dispute between the Institute and the Contracting Officer concerning a question of fact within the meaning of the "Disputes" clause of the Prime Contract.
- (c) The Contractor shall permit any authorized representatives of the Government to examine and make copies of any documents, papers, or records relating to compliance with the requirements of this Provision.
- (d) The Contractor shall include the substance of this Provision in all negotiated subcontracts which the Contractor enters into, except for paragraph (b) of this Section, and shall require such inclusion in all other subcontracts of any tier, including the obligation to comply with all CAS in effect on the subcontractor's award date, or if the subcontractor has submitted cost or pricing data, on the date of final agreement on price as shown on the subcontractor's signed Certificate of Current Cost or Pricing Data; provided however, this requirement shall apply only to negotiated subcontracts in excess of \$500,000, except that the requirement shall not apply to negotiated subcontracts otherwise exempt from the requirement to include a CAS clause as specified in 48 CFR 9903.201-1 or any corresponding implementing or supplementing provisions in the NFS.

SECTION II - ADMINISTRATION OF COST ACCOUNTING STANDARDS

For the purpose of administering Cost Accounting Standards (CAS) requirements under this Contract, the Contractor shall take the steps outlined in paragraphs (a) through (g) of this section:

- (a) Submit to the cognizant Contracting Officer a description of any cost accounting practice change, the total potential impact of the change on contracts containing a CAS provision, and a general dollar magnitude of the change which identifies the potential shift of costs between CAS-covered contracts by contract type (i.e., firm-fixed-price, incentive cost-plus-fixed-fee, etc.) and other contractor business activity. As related to CAS-covered contracts, the analysis should identify the potential impact on funds of the various Agencies/Departments (i.e., Department of Energy, National Aeronautics and Space Administration, Army, Navy, Air Force, other Department of Defense, other Government), as follows:
 - (1) For any change in cost accounting practices in accordance with subparagraph (a)(3) and subdivision (a)(4)(A) of Section I of this Provision, within 60 days (or such other date as may be mutually agreed to) after award of a contract requiring this change.
 - (2) For any change in cost accounting practices proposed in accordance with subdivision (a)(4)(B) or (C) of Section I of this Provision, not less than 60 days (or such other date as may be mutually agreed to) before the effective date of the proposed change.

- (3) For any failure to comply with an applicable CAS or to follow a disclosed practice (as contemplated by subparagraph (a)(5) of Section I of this Provision:
 - (A) Within 60 days (or such other date as may be mutually agreed to) after the date of agreement with the initial finding of noncompliance; or
 - (B) In the event of Contractor disagreement with the initial finding of noncompliance, within 60 days of the date the Contractor is notified by the Contracting Officer of the determination of noncompliance.
- (b) After an ACO determination of materiality, submit a cost impact proposal in the form and manner specified by the Contracting Officer within 60 days (or such other date as may be mutually agreed to) after the date of determination of the adequacy and compliance of a change submitted pursuant to paragraph (a) of this Section. The cost impact proposal shall be in sufficient detail to permit evaluation, determination, and negotiation of the cost impact upon each separate CAS-covered contract and subcontract.
 - (1) Cost impact proposals submitted for changes in cost accounting practices in accordance with subparagraph (a)(3) and subdivision (a)(4)(A) of Section I of this Provision shall identify the applicable standard or principle and all contracts and subcontracts containing this Provision which have an award date before the effective date of that standard or cost principle.
 - (2) Cost impact proposals submitted for any change in cost accounting practices proposed in accordance with subdivisions (a)(4)(B) or (C) of Section I of this Provision shall identify all contracts and subcontracts containing this Provision.
 - (3) Cost impact proposals submitted for failure to comply with an applicable CAS or to follow a disclosed practice as contemplated by subparagraph (a)(5) of Section I of this Provision shall identify the cost impact on each separate CAS covered contract from the date of failure to comply until the noncompliance is corrected.
- (c) If the submissions required by paragraphs (a) and (b) of this Section are not submitted within the specified time, or any extension granted by the Government contract administration office, an amount not to exceed 10% of each subsequent amount determined payable related to the Contractor's CAS-covered prime contracts, up to the estimated general dollar magnitude of the cost impact, may be withheld until such time as the required submission has been provided in the form and manner specified by the Government contract administration office.
- (d) Agree with the Institute to appropriate amendments to contracts and subcontracts to reflect adjustments established in accordance with subparagraphs (a)(4) and (a)(5) of Section I of this Provision.
- (e) For all subcontracts subject either to this Provision:
 - (1) So state in the body of the subcontract, in the letter of award, or in both (self-deleting clauses shall not be used); and
 - (2) Include the substance of this Provision in all negotiated subcontracts. In addition, within 30 days after award of the subcontract, submit the following information to the Contractor's cognizant contract administration office for transmittal to the contract administrative office cognizant of the subcontractor's facility:
 - (A) Subcontractor's name and subcontract number.
 - (B) Dollar amount and date of award.
 - (C) Name of Contractor making the award.
 - (D) Any changes the subcontractor has made or proposes to make to cost accounting practices that affect prime contracts or subcontracts containing this Provision, unless these changes have already been reported. If award of the subcontract results in making one or more CAS effective for the first time, this fact shall also be reported.
- (f) In the event an adjustment is required to be made to any subcontract hereunder, notify the JPL negotiator and the subcontractor's Government contract administration office in writing of any adjustments required to subcontracts under this Contract and agree to an adjustment, based on them, to this Contractor's price or estimated cost and fee. This notice is due within 30 days after proposed subcontract adjustments are received and shall include a proposal for adjusting the higher tier subcontract or the prime contract appropriately.

- (g) For subcontracts containing this Provision require the subcontractor to comply with all Standards in effect on the date of award or of final agreement on price, as shown on the subcontractor's signed Certificate of Current Cost or Pricing Data, whichever is earlier.

PATENT AND COPYRIGHT AGREEMENT

- (a) The Contractor agrees to:
 - (1) Require as a prerequisite to the performance of any support contract work by any employee of the Contractor that each of them execute the equivalent of a "Patent and Copyright Agreement" assignment (attached form JPL 1929), except those in clerical categories; and
 - (2) Notify JPL without delay and prior to the performance of any work, of the refusal of any employee of the Contractor, designated to perform work pursuant to this Contract, to execute the "Patent and Copyright Agreement," form JPL 1929 or its equivalent.
- (b) The Contractor hereby waives and releases, relinquishes and assigns to JPL all legal rights, including copyrights, title and interest to which it might otherwise be entitled by contract or under any applicable laws, in any copyright, reportable invention, discovery, innovation, improvement, or other matter whether or not patentable, that an employee of the Contractor solely, or jointly with others, conceives or actually reduces to practice in the performance of work pursuant to the above-identified Contract. The Contractor agrees to require its employees who work on the Contract to disclose promptly and fully to the California Institute of Technology, hereinafter referred to as the Institute, or to any individual, corporation, or Governmental agency which the Institute may specify, all inventions, discoveries, innovations, improvements, and other matters, whether or not patentable, that each solely, or jointly with others, conceives or actually reduces to practice in the performance of work pursuant to the Contract. If requested, the Contractor will provide JPL with any such executed "Patent and Copyright Agreement" forms.

AUDIT-NEGOTIATION - ACCESS TO COMPUTERS

Government auditors will be provided, at their option, access to physically inspect and inventory computer systems, equipment, and software used at JPL. This clause is applicable to all computers used at JPL, regardless of who owns the computers.

CONTINUITY OF SERVICES

- (a) The Contractor recognizes that the services under this Contract are vital to JPL and must be continued without interruption and that, upon Contract expiration, a successor, either JPL or another contractor, may continue them. The Contractor agrees to:
 - (1) Furnish phase-in training; and
 - (2) Exercise its best efforts and cooperation to effect an orderly and efficient transition to a successor.
- (b) The Contractor shall, upon JPL's written notice, (i) furnish phase-in, phase-out (PIPO) services for up to 90 days after this Contract expires and (ii) negotiate in good faith a plan with a successor to determine the nature and extent of PIPO services required. The plan shall specify a training program and a date for transferring responsibilities for each division of work described in the plan, and shall be subject to JPL's approval. The Contractor shall provide sufficient experienced personnel during the PIPO period to ensure that the services called for by this Contract are maintained at the required level of proficiency.
- (c) The Contractor shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this Contract. The Contractor also shall disclose necessary personnel records and allow the successor to conduct on-site interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.
- (d) The Contractor shall be reimbursed for all reasonable PIPO costs (i.e., costs incurred within the agreed period after Contract expiration that result from PIPO operations) and a fee (profit) not to exceed a pro rata portion of the fee (profit) under this Contract.

DRUG AND ALCOHOL FREE WORKFORCE

- (a) Definitions. As used in this clause the terms "employee," "controlled substance," "employee in a sensitive position," and use, in violation of applicable law or Federal regulation, of alcohol are as defined in 48 CFR 1823.570-2.
- (b) (1) The Contractor shall institute and maintain a program for achieving a drug-and alcohol-free workforce. As a minimum, the program shall provide for preemployment, reasonable suspicion, random, post-accident, and periodic recurring (follow-up) testing of contractor employees in sensitive positions for use, in violation of applicable law or Federal regulation, of alcohol or a controlled substance. The Contractor may establish its testing or rehabilitation program in cooperation with other contractors or organizations.
- (2) This clause neither prohibits nor requires the Contractor to test employees in a foreign country. If the Contractor chooses to conduct such testing, this clause does not authorize the Contractor to violate foreign law in conducting such testing.
- (3) The Contractor's program shall test for the use of marijuana and cocaine. The Contractor's program may test for the use of other controlled substances.
- (4) The Contractor's program shall conform to the "Mandatory Guidelines for Federal Workplace Drug Testing Programs" published by the Department of Health and Human Services (59 FR 29908, June 9, 1994) and the procedures in 49 CFR part 40, "Procedures for Transportation Workplace Drug Testing Programs," in which references to "DOT" shall be read as "NASA", and the split sample method of collection shall be used.
- (c) (1) The Contractor's program shall provide, where appropriate, for the suspension, disqualification, or dismissal of any employee in a sensitive position in any instance where a test conducted and confirmed under the Contractor's program indicates that such individual has used, in violation of applicable law or Federal regulation, alcohol or a controlled substance.
- (2) The Contractor's program shall further prohibit any such individual from working in a sensitive position on a JPL contract, unless such individual has completed a program of rehabilitation described in paragraph (d) of this clause.
- (3) The Contractor's program shall further prohibit any such individual from working in any sensitive position on a JPL contract if the individual is determined under the Contractor's program to have used, in violation of applicable law or Federal regulation, alcohol or a controlled substance and the individual meets any of the following criteria:
- (A) The individual had undertaken or completed a rehabilitation program described in paragraph (d) of this clause prior to such use;
- (B) Following such determination, the individual refuses to undertake such a rehabilitation program;
- (C) Following such determination, the individual fails to complete such a rehabilitation program; or
- (D) The individual used a controlled substance or alcohol while on duty.
- (d) The Contractor shall institute and maintain an appropriate rehabilitation program which shall, as a minimum, provide for the identification and opportunity for treatment of employees whose duties include responsibility for safety-sensitive, security, or National security functions who are in need of assistance in resolving problems with the use of alcohol or controlled substances.
- (e) The requirements of this clause shall take precedence over any state or local Government laws, rules, regulations, ordinances, standards, or orders that are inconsistent with the requirements of this clause.
- (f) For any collective bargaining agreement, the Contractor will negotiate the terms of its program with employee representatives, as appropriate, under labor relations laws or negotiated agreements. Such negotiation, however, cannot change the requirements of this clause. Employees covered under collective bargaining agreements will not be subject to the requirements of this clause until those agreements have been modified, as necessary; provided, however, that if one year after commencement of negotiation the parties have failed to reach agreement, an impasse will be determined to have been reached and the Contractor will unilaterally implement the requirements of this clause.
- (g) The Contractor shall insert a clause containing all the terms of this clause, including this paragraph (g), in all subcontracts in which work is performed by an employee in a sensitive position, except subcontracts for commercial items (see FAR parts 2 and 12).

DUTY-FREE ENTRY

- (a) Except as otherwise approved by JPL, no amount is or will be included in the Contract price for any duties on supplies specifically identified in the Schedule to be accorded duty-free entry.
- (b) Except for supplies listed in the Schedule to be accorded duty-free entry, and except as provided under any other provision of this Contract or in paragraph (c) below, the following procedures apply:
 - (1) The Contractor shall notify JPL in writing of any foreign supplies (including, without limitation, raw materials, components, and intermediate assemblies) in excess of \$10,000 that are to be imported into the customs territory of the United States for delivery, or for incorporation into end items to be delivered, under this Contract. The notice shall be furnished to JPL, for submission to the Contracting Officer at least 20 days before the importation, and shall identify:
 - (A) The foreign supplies;
 - (B) The estimated amount of duty; and
 - (C) The country of origin.
 - (2) If the Contracting Officer determines that these supplies should be entered duty-free, JPL shall notify the Contractor within 10 days.
 - (3) Except as otherwise approved by JPL, the Contract price shall be reduced by (or the allowable cost shall not include) the amount of duty that would be payable if the supplies were not entered duty-free.
- (c) Paragraph (b) above shall not apply if:
 - (1) The foreign supplies are identical in nature with items purchased by the Contractor or any subcontractor in connection with its commercial business; and
 - (2) Segregation of these supplies to ensure use only on Government contracts containing duty-free entry provisions is not economical or feasible.
- (d) The Contractor warrants that all supplies for which duty-free entry is to be claimed are intended to be delivered, or incorporated into the end items, to be delivered under this Contract, and that duty shall be paid to the extent that these supplies, or any portion of them, are diverted to non-Governmental use, other than as scrap or salvage or as a result of a competitive sale authorized by JPL.
- (e) JPL agrees to request that the Government execute any required duty-free entry certificates for items specified in this Contract or approved by the Contracting Officer.
- (f) All shipping documents covering the supplies to be entered duty-free shall consign the shipments to the National Aeronautics and Space Administration, Jet Propulsion Laboratory, and shall include JPL's delivery address. The documents shall bear the following information:
 - (1) Government prime contract number.
 - (2) Identification of carrier and bill of lading/air waybill number.
 - (3) The notation "UNITED STATES GOVERNMENT, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION. Duty-free entry to be claimed pursuant to Item No 9808.00.8000 Tariff Schedules of the United States (19 U.S.C. 1202).
 - (4) Gross weight in pounds (if freight is based on space tonnage, state cubic feet in addition to gross shipping weight).
 - (5) Value in United States dollars.
 - (6) The country of origin.
- (g) The Contractor agrees to consign the shipment as specified in (f) above, to mark all packages with the words "UNITED STATES GOVERNMENT, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, JET PROPULSION LABORATORY," and that at least two copies of the bill of lading/air waybill (or other shipping document) shall accompany the shipment for use by the District Director of Customs at the port of entry. As soon as possible but in no circumstances later than at time of shipment, the contractor shall provide copies of all shipping documents (including invoice & bill of lading/air waybill) via facsimile transmission to the Supervisor, JPL Receiving & Shipping so that the process for duty-free entry can begin.

PERFORMANCE ASSESSMENT REPORTS

Data Requirements Description

DRD No. M006

Issue RFP

Data Type 2

Date Revised

Description/Use

The Performance Assessment Report will provide data for measurement of the cost and schedule status, and cost performance of the Contractor.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

30 days after contract award.

Submission Frequency

Report due not later than 10 working days following the close of the Contractor's monthly accounting period, unless otherwise specified in the contract.

Data Preparation Information

Scope

1. The Monthly Performance Assessment Report submitted by the Contractor will provide an assessment of contract performance and provide visibility on DSMS Operations costs to the DSMS Operations Program Office.

Applicable Documents

1. Task Descriptive Document

Contents

1. The Contractor shall use a monthly cost tracking report system. Detail data that supports the information reported in the performance assessment reports shall be retained at the Contractor's facility and made available for JPL review and audit.
2. Variance Analysis Reports

The contractor shall provide planned vs. actual data, plus variance in dollars and percentage at the lowest level of the WBS. The reports shall be summarized at successively higher levels of the WBS, including the total program level. Include a narrative variance analysis with supporting detail at Level 4. The data shall include monthly and cumulative values for the following cost items:

 - a. Direct Labor Cost
 - b. Direct Material and Other Direct Costs

- c. Other Costs including indirect costs and G&A
 - d. Total costs.
 - e. Workforce (FTE's)
3. Cost and Schedule Status Report
- The contractor shall provide an assessment of the cost and schedule status based on the schedule required in DRD M002. A variance analysis shall be included with the report and include the impact and any corrective actions at the appropriate schedule activity level.
4. Funding Reports
- The contractor shall provide incremental funding requirements profile (Assume Quarterly Funding Increments) vs actual funds provided.
5. Estimate to Complete Projection
- The contractor shall provide an estimate to complete projection at Level 1 of the WBS and include variance analysis from the baseline plan.
6. Baseline Plan Deviation
- The contractor shall provide the deviation from the baseline plan and the current negotiated contract value and an explanation for the deviation.

- (h) The Contractor agrees to insert the substance of this provision in any subcontract under which:
- (1) There will be imported into the customs territory of the United States supplies identified in the Schedule as supplies to be accorded duty-free entry; or
 - (2) Other foreign supplies in excess of \$10,000 may be imported into the customs territory of the United States.

FACILITIES EQUIPMENT MODERNIZATION

- (a) The Contractor agrees to return to JPL or the Government the net cost savings realized from using modernized or replacement equipment provided by JPL or the Government under this Contract. This applies to using such equipment on any contracts or subcontracts that are firm-fixed price, or that are fixed-price with economic price adjustment provisions, entered into within the three years following the date such equipment is placed into production. This Provision does not apply to the use of such equipment in sealed bid contracts entered into after the equipment is placed in production or in contracts or subcontracts that specifically provide that they have been priced on the basis of anticipated use of such equipment.
- (b)
 - (1) The Contractor shall maintain adequate records for implementing this clause. The Contractor shall make such records available at its office for inspection, audit, or reproduction by any authorized representative of the Contracting Officer, including JPL representatives.
 - (2) When the Contractor authorizes a subcontractor to use the modernized or replacement equipment, the subcontractor shall be required to maintain records and make them and additional information available to JPL and the Contracting Officer.
- (c) Records of equipment shall generally be acceptable if they are maintained under established accounting practices and permit a fair estimation of the net cost savings realized. Net cost savings realized shall be determined by a comparison of the Contractor's cost experience in the operation of the equipment before and after modernization.
- (d) Amounts due JPL or the Government under this Provision shall be returned by the Contractor, as directed by the JPL Negotiator by:
 - (1) Credits to, or adjustment of the prices of, the related contracts benefiting from using the modernized or replacement equipment;
 - (2) Payment to the Government through the Contracting Officer having cognizance of the equipment; or payment to JPL through the contract negotiator having cognizance of the equipment; or
 - (3) Any other means mutually agreed to.

FILING OF PATENT APPLICATIONS - CLASSIFIED SUBJECT MATTER

- (a) Before filing or causing to be filed a patent application in the United States disclosing any subject matter of this Contract classified "Secret" or higher, the Contractor shall, citing the 30-day provision below, transmit the proposed application to the Contracting Officer. The Contracting Officer shall determine whether, for reasons of national security, the application should be placed under an order of secrecy, sealed in accordance with the provision of 35 U.S.C. 181-188, or the issuance of a patent otherwise delayed under pertinent United States statutes or regulations. The Contractor shall observe any instructions of the Contracting Officer regarding the manner of delivery of the patent application to the United States Patent Office, but the Contractor shall not be denied the right to file the application. If the Contracting Officer shall not have given any such instructions within 30 days from the date of mailing or other transmittal of the proposed application, the Contractor may file the application.
- (b) Before filing a patent application in the United States disclosing any subject matter of this Contract classified "Confidential," the Contractor shall furnish to the Contracting Officer a copy of the application for Government determination whether, for reasons of national security, the application should be placed under an order of secrecy or the issuance of a patent should be otherwise delayed under pertinent United States statutes or regulations.
- (c) Where the subject matter of this Contract is classified for reasons of security, the Contractor shall not file, or cause to be filed, in any country other than in the United States as provided in paragraphs (a) and (b) of this Article, an application or registration for a patent containing any of the subject matter of this Contract without first obtaining written approval of the Contracting Officer.
- (d) When filing any patent application coming within the scope of this Article, the Contractor shall observe all applicable security regulations covering the transmission of classified subject matter and shall promptly furnish to the Contracting Officer the serial number, filing date, and name of the country of any such application. When transmitting the application to the United States Patent Office, the Contractor shall by separate letter identify by agency and number the contract or contracts that require security classification markings to be placed on the application.
- (e) The Contractor agrees to include, and require the inclusion of, this Article in all subcontracts at any tier that cover or are likely to cover classified subject matter.

FOREIGN TRAVEL REPORTING REQUIREMENTS

- (a) The Contractor shall provide JPL with the information described in paragraph c of this article as soon as possible, but in all instances, excepting special circumstances, at least 12 work-days in advance of any foreign travel that meets the circumstances described in paragraph b of this article.
- (b) The Contractor shall provide JPL with the information described in paragraph c of this article under any of the following circumstances:
 - (1) Contractor personnel traveling to, or meeting with JPL personnel at, foreign destinations which are on the NASA-provided list of countries requiring advance notification of travel to the State Department through NASA Headquarters.
 - (2) Contractor personnel anticipate requiring support from the U.S. Embassy or Consulate in the country to be visited.
- (c) The Contractor shall provide the following information for all traveling contractor personnel to JPL under the circumstances described in paragraph b of this Article:
 - (1) Purpose of travel, program, project, activity etc.
 - (2) Organization/entity to be visited and point of contact/phone number.
 - (3) Traveler's name.
 - (4) Traveler's title.
 - (5) Traveler's citizenship.
 - (6) Traveler's passport number and expiration date.
 - (7) Traveler's date and place of birth.
 - (8) Traveler's employer and address.
 - (9) Traveler's phone and fax number.
- (d) The Contractor shall insert this article including this paragraph in all subcontracts.

FREQUENCY AUTHORIZATION

- (a) Authorization of radio frequencies required in support of this Contract shall be obtained by the Contractor or subcontractor in need thereof.
- (b) For any experimental, developmental, or operational equipment for which the appropriate frequency allocation has not been made, the Contractor or subcontractor shall provide the technical operating characteristics of the proposed electromagnetic radiating device to JPL during the initial planning, experimental, or developmental phase of contractual performance. Procedures furnished by JPL shall be followed in obtaining radio frequency authorization.
- (c) This Article, including this paragraph (c), shall be included in all subcontracts which call for developing, producing, testing, or operating a device for which a radio frequency authorization is required.

INSPECTION OF SERVICES

- (a) Definition. "Services," as used in this Article, includes services performed, workmanship, and material furnished or utilized in performance of services.
- (b) The Contractor shall provide and maintain an inspection system acceptable to JPL covering the services under this Contract. Complete records of all inspection work performed by the Contractor shall be maintained and made available to JPL during Contract performance and for as long afterwards as the Contract requires.
- (c) JPL has the right to inspect and test all services called for by the Contract, to the extent practicable at all times and places during the term of the Contract. JPL shall perform inspections and tests in a manner that will not unduly delay the work.
- (d) If JPL performs inspections or tests on the premises of the Contractor or a subcontractor, the Contractor shall furnish, and shall require subcontractors to furnish, all reasonable facilities and assistance for the safe and convenient performance of those duties, without additional charge, or if this is a cost reimbursement contract, without additional fee.
- (e) If any of the services do not conform with Contract requirements, JPL may require the Contractor to perform the services again in conformity with Contract requirements, at no increase in Contract amount, or, if this is a cost-reimbursement contract, for no additional fee. When the defects in services cannot be corrected by reperformance, JPL may:
 - (1) Require the Contractor to take necessary action to ensure that future performance conforms to Contract requirements; and
 - (2) Reduce the Contract price, or, if this a cost-reimbursement contract, reduce any fee payable under the Contract, to reflect the reduced value of the services performed.
- (f) If the Contractor fails to promptly perform the services again or to take the action necessary to ensure future performance in conformity with Contract requirements, JPL may:
 - (1) By Contract or otherwise, perform the services and charge to the Contractor any cost incurred by JPL that is directly related to the performance of such service; or
 - (2) Terminate the Contract for default.

PRIME CONTRACT EXPIRATION – COST/CREI

- (a) This Contract may be assigned, novated, or transferred to a successor-in-interest, a successor contractor to operate the Jet Propulsion Laboratory, or the Government.
- (b) The Contractor shall provide to JPL a report with all costs estimated to be incurred under this Contract through September 28, 2003, 45-days in advance thereof and a second report with actual costs incurred through September 28, 2003, within 45-days thereafter. Reported costs are subject to final rate audit and potential adjustment. Invoices for September 2003 shall coincide with September 28, not 30. Costs can be reported at the top WBS level. The purpose of the cost report is to enable JPL to allocate and account costs under the current and anticipated successor JPL/NASA prime contract. Backup financial records and invoices should be retained for a reasonable period of time following the Contract end date.

SAFETY AND HEALTH

(This Article is applicable only if the Contract (i) involves work on or with JPL pressure vessel(s) or pressure system(s) or the Contractor intends to install or operate pressure vessel(s) or pressure system(s) on a JPL or JPL-controlled facility, regardless of dollar value; (ii) requires work involving the use of hazardous materials or operations, regardless of dollar value; (iii) exceeds \$25,000 and involves construction, repair, or alteration of facilities; or (iv) exceeds \$1,000,000, unless a waiver is granted.)

- (a) The Contractor shall take all reasonable safety and health measures in performing under this Contract and shall, to the extent set forth below, submit a safety plan and a health plan (applicable to the work to be performed under this Contract) for JPL's approval. The Contractor shall comply with all Federal, State, and local laws applicable to safety and health in effect on the date of this Contract and with the safety and health standards, specifications, reporting requirements, and provisions set forth below.
- (b) The Contractor shall take or cause to be taken any other safety and health measures JPL may reasonably direct. To the extent that the Contractor may be entitled to an equitable adjustment for those measures under the terms and conditions of this contract, the equitable adjustment shall be determined pursuant to the procedures of the Article of this Contract entitled "Changes," provided, that no adjustment shall be made under this Safety and Health Article for any change for which an equitable adjustment is expressly provided under any other provision of the Contract.
- (c) Standards. The following safety and health standards, specifications, issuances, and reporting requirements are prescribed pursuant to paragraph (a).
 - (1) General Standards and Specifications: The Contractor shall comply with applicable provisions of the Occupational Safety and Health Standards of the Occupational Safety and Health Act of 1970, Rules and Regulations of the Department of Labor issued pursuant thereto and regulations of states provided for under the Act. Within California the Contractor shall comply with applicable provisions of the California Occupational Safety and Health Act of 1973. NASA Procedures and Guidelines (NPGs) 8715, Draft 2, Safety Manual, shall be used as a general policy guide to establish a safety program to be included in the safety and health plan to be submitted in accordance with paragraph (a) above.
 - (2) As part of the Contractor's safety and health plan, the Contractor shall furnish a list of all hazardous operations to be performed, including operations covered by measures indicated in paragraphs (a) and (b) of this Article and a list of other major or key operations required or planned in the performance of the Contract, even though not deemed hazardous by the Contractor. JPL and the Contractor shall jointly decide which operations are to be considered hazardous with JPL as the final authority. Before hazardous operations commence, the Contractor shall develop, review, and provide plans for the operation for JPL to review. The Contractor's review procedure shall include evaluations by operating personnel, management and safety professionals, as appropriate. Lists of personnel trained and certified or specified for each hazardous operation shall be maintained. Such records shall be supplied to JPL on request.
 - (3) Flight Project Safety: The Contractor shall include in each Project Plan prepared for a flight project the safety needs and special safety monitoring required for the flight project. Project Plans containing such requirements will be referenced in the flight project task order issued by the Contracting Officer under the Prime Contract and the Contractor shall comply with those requirements.
 - (4) Nuclear Safety: Radioactive material will be handled in accordance with appropriate State of California, Department of Energy and/or Nuclear Regulatory Commission requirements and in accordance with National Aeronautics and Space Council document, "Nuclear Safety Review and Approval Procedures for Minor Radioactive Sources in Space Operations". Additionally, when radioactive material is to be used in space launches, they shall meet the requirements of the Interagency Nuclear Safety Review Panel (INSRP) as directed by the President of the United States.
 - (5) Propulsion Safety: The Contractor shall comply with all applicable Federal, State, and local requirements applicable to propulsion safety, and the requirements shall be used to establish a propulsion safety program (if applicable) to be included in the safety and health plan to be submitted in accordance with paragraph (a) above.
 - (6) Fire Protection and Life Safety: The Contractor shall comply with all applicable Federal, State, and Local requirements pertaining to fire protection and life safety. NASA Std NSS 1740.11, NASA Safety Standard for Fire Protection and Life Safety will be followed to ensure safety of NASA facilities.
 - (7) Ammunition and Explosive Safety: The Contractor shall comply with all applicable Federal, State, and Local requirements pertaining to ammunition and explosive safety and the requirements shall be used to

- establish a propulsion safety program to be included in the safety and health plan to be submitted in accordance with paragraph (a) above.
- (8) Pressure Vessel and Pressure System Safety: All Contractors performing work under this Contract on or with JPL pressure vessels or pressure systems or pressure vessels or pressure systems to be installed or operated on a JPL or JPL controlled facility shall comply with the requirements of JPL Safety Practice 4-08-70, Pressure Vessels and Systems, currently in effect (copy available upon request) or JPL Safety Office approved equivalent submitted by the Contractor.
 - (9) Any additional safety and health standards, specifications, issuances and reporting requirements set forth in this Contract.
- (d) The safety and health plan to be submitted by the Contractor pursuant to paragraph (a) above shall implement the requirements of this Article and of the standards and specifications of paragraph (c) of this Article and shall describe the means to be employed by the Contractor to monitor and enforce said requirements. The plan shall include the Contractor's standards and criteria for imposing safety and health standards upon its subcontractors of any tier and its plans and procedures for monitoring compliance with such standards. A safety and health plan for similar work performed by the Contractor on a Federal contract may be submitted for review and approval under this Article.
- (e) The Contractor shall immediately notify and promptly report to JPL any accident, incident, or exposure resulting in fatality, lost-time occupational injury, occupational disease, contamination of property (or, if this Contract sets forth any acceptable threshold limits of contamination, any contamination of property beyond those stated limits) or property loss of \$25,000 or more arising out of work performed under this Contract. The Contractor is not required to include in any report an expression of opinion as to the fault or negligence of any employee. Service contractors (excluding construction contracts) shall provide quarterly reports specifying lost-time frequency rate, number of lost-time injuries, exposure, and accident/incident dollar losses as specified in the contract Schedule. The Contractor shall investigate all work-related incidents or accidents to the extent necessary to determine their causes and furnish the JPL a report, in such form as JPL may require, of the investigative findings and proposed or completed corrective actions. In addition, the Contractor shall comply with the illness, incident and injury experience reporting requirements set forth below or elsewhere in this Contract.
- (f) Illness, Incident and Injury Experience Reports.
- (1) Reports required by this Article or elsewhere in this Contract shall be furnished in three copies unless otherwise specified.
 - (2) The following illness, incident, and injury experience reports are prescribed pursuant to paragraph (e) above:
 - (A) Investigative Reports: The Contractor shall furnish reports of investigation of individual incidents or accidents or close calls in formats approved by JPL; provided, however, that the Contractor shall not be required to furnish personally identifiable information concerning Contractor or subcontractor employees. Lessons learned from these reports, excluding those related to close calls unless the Contractor believes that material value may be derived from such reporting shall be reported to JPL (for use by JPL as inputs into the NASA Lessons Learned Program).
 - (B) Mishap Reports: The Contractor shall furnish JPL mishap reports and respond to JPL requests for mishap reviews. The Contractor shall conduct its own mishap investigations consistent with NPD 8621.1G, NASA Mishap Reporting and Investigating Policy, dated December 1997, with the understanding that all references to NASA in that policy shall be interpreted to mean the Contractor. The Contractor shall utilize the NPD 8621.1G procedures as guidelines. The Contractor shall also report to the JPL negotiator any incidents that may have visibility in the press, mission failures, or mission anomalies which will have high JPL or NASA visibility in the press.
 - (C) Experience Reports: If this Contract requires more than just a small amount of work on a Government installation or premises under the control of the Institute, the Contractor shall prepare and submit to JPL quarterly and semi-annual reports of occupational related illness, incidents, injury experience, and Government property damage due to mishaps or natural phenomena in such detail as prescribed in formats approved by the JPL Negotiator.
 - (D) The Contractor shall furnish such other reports as JPL determines to be related to the Contractor's safety and health program and its experiences thereunder.

- (g) (1) JPL may notify the Contractor in writing of any noncompliance with this Article and specify corrective actions to be taken. The Contractor shall promptly take and report any necessary corrective action.
- (2) If the Contractor fails or refuses to institute prompt corrective action in accordance with subparagraph (g)(1) of this Article, JPL may invoke any stop work or suspension of work provision of this Contract or any other remedy legally available to the Institute in the event of such failure by the Contractor.
- (h) The Contractor (or subcontractor or supplier) shall cause the substance of this Article, including this paragraph (h) and any applicable provisions of this Contract, with any appropriate changes of designations of the parties, to be inserted in subcontracts of every tier which:
 - (1) Amount to \$1,000,000 or more, unless JPL makes a written determination that this is not required;
 - (2) Require construction, repair, or alteration in excess of \$25,000;
 - (3) Regardless of dollar amount, involve the use of hazardous materials or operations; or
 - (4) Regardless of dollar amount, involve work on or with JPL pressure vessel(s) or pressure system(s) or the installation or operation of pressure vessel(s) or pressure system(s) on a JPL or JPL-controlled facility.
- (i) The Contractor agrees that authorized representatives of JPL or the Contracting Officer shall have access to and the right to examine the sites or areas where work under this Contract is being performed in order to determine the adequacy of the Contractor's safety and health measures under this Article.

SECURITY REQUIREMENTS

- (a) This Article applies to the extent that this Contract involves access to information classified "Confidential," "Secret," or "Top Secret."
- (b) JPL will notify the Contractor of the security classification of this Contract and the elements thereof, and of any subsequent revisions in such security classification, by the use of a Contract Security Classification Specification (DD Form 254), or other written notification.
- (c) The Contractor shall comply with (i) the Security Agreement (DD Form 441), including the Department of Defense National Industrial Security Program Operating Manual (DOD 5220.22-M), and (ii) any revisions to that manual, notice of which has been furnished to the Contractor.
- (d) If, subsequent to the date of this Contract, the security classification or security requirements under this Contract are changed by the Government or by JPL and if the changes cause an increase or decrease in security costs or otherwise affect any other term or condition of this Contract, the Contract shall be subject to an equitable adjustment as if the changes were directed under the "Changes" Article of this Contract.
- (e) The Contractor agrees to insert terms that conform substantially to the language of this Article, including this paragraph (e) but excluding any reference to the "Changes" Article of this Contract, in all subcontracts under this Contract that involve access to classified information.

SECURITY REQUIREMENTS FOR UNCLASSIFIED AUTOMATED INFORMATION RESOURCES AND ACCESS TO JPL'S CONTROLLED FACILITIES (CT, FP-NR&D, FP-R&D, CIS, LH-T&M, T&MC, FPC, CREI, A-E)

- (a) In addition to complying with any functional and technical security requirements set forth in the schedule and the provisions of this Contract, the Contractor shall request JPL badges for its personnel who require regular, unescorted, or unsupervised physical access to JPL and who need physical access to limited or controlled areas within the facility. In addition, the Contractor shall obtain unique electronic identifications (from the JPL Enterprise Information System) for its personnel that need electronic access to JPL systems, programs, and data.
- (b) Computer Security Requirements. The requirements stated in JPL D-7155, Rev. 4, "JPL Information Technology Security Requirements for Computer Systems" (incorporated by reference), and JPL D-7223, Rev. 5, "Automated Information Security Requirements for Computer Users" (incorporated by reference), apply to all systems that are part of the "jpl.nasa.gov" domain and to all workstations used by JPL contractors to remotely access JPL computing and network resources, regardless of the workstation's location. Remote access is defined as logging into a JPL computer system through a network or a modem, to execute a command on the JPL computer system from a remote location, or to manipulate data stored on the JPL computer system from a remote site. Compliance with these requirements will be monitored by periodic announced computer security audits performed by the JPL Network and Computer Security Group.
- (c) Controlled Facilities. JPL facilities, as defined by the NASA Resource Protection Program Consolidated Resource List (incorporated by reference), are designated as controlled facilities.
- (d) Personnel Investigations.
 - (1) National Agency Check (NAC) Requirements.
 - (A) All Contractor personnel assigned to JPL for computer system administration, computer system maintenance (hardware and/or software), network operation, computer operation, or have access to sensitive information as defined in Appendix A to JPL D-7155, Rev. 4, must deliver completed NAC paperwork to the JPL Security Office prior to reporting for work at JPL.
 - (B) All Contractor personnel requiring access to controlled facilities must deliver completed NAC paperwork to the JPL Security Office prior to reporting for work at JPL.
 - (C) NAC/s require original proof of United States citizenship or eligibility for employment. Contractor personnel with existing security clearance based on an investigation current within the last five years are not required to submit NAC forms, if their clearance is under five years old, but the Contractor must submit a Classified Visit Request for each individual.
 - (D) The following NAC forms must be completed as stated:
 - (i) NASA Form 531, Name Check Request, must have the following sections typed: NAME, OTHER NAMES USED (if applicable), SEX, DATE OF BIRTH, PLACE OF BIRTH, U.S. NAT. NO. (if applicable), ALIEN REGIS. NO. (if applicable), CITIZENSHIP, SOCIAL SECURITY NO., FULL NAME OF SPOUSE(S), INCLUDING MAIDEN NAME(S) (if applicable), RESIDENCES IN EXCESS OF THREE MONTHS FOR THE PAST FIVE YEARS, EMPLOYMENT FOR THE PAST FIVE YEARS, CURRENT WORK PHONE NUMBER, PURPOSE OF REQUEST.
 - (ii) The U.S. Office of Personnel Management OFI Form 79, Notice of Personnel Investigation, must have sections 1 through 4 plus 5 (if applicable) typed.
 - (2) Pre-NAC Access Requirements. In the absence of information suggesting that pre-NAC access is not advised, contractor personnel will have access on an interim basis once the completed NAC request forms and all required documents are delivered to the JPL Security Office, Building 180, Room 102.
- (e) Security Incident Reporting. The Contractor shall promptly report to the JPL Computer Security Hotline, (818) 354-8277, any suspected computer or network security incidents as defined in JPL D-7973, Rev. 1, "JPL Information Technology Security Incident Investigation and Reporting Manual" (incorporated by reference), occurring on any systems that are required to meet the JPL Computer Security Requirements paragraph. The JPL Network and Computer Security Group will validate that there is an incident and the contractor will provide to the JPL Network and Computer Security Group all necessary assistance and access to affected systems to conduct a detailed investigation.
- (f) Laboratory Access.

- (1) As a NASA closed facility, JPL requires that all personnel possess valid identification for unescorted access. Individuals who access the Laboratory on a one-time or infrequent basis are processed as visitors. All visitors are processed through the Visitor Control Center and must possess a valid picture ID issued from a recognized government agency or business organization. All non-U.S. born citizens must possess the original proof of citizenship. All visits by foreign nationals must be approved in advance, and the visitor must possess their original passport or visa as proof of identification and legal status.
- (2) Individuals who access the Laboratory on a regular basis for business related activities but do not occupy JPL office space may be provided a non-embossed picture badge. This badge allows the individual to access JPL through any guard-staffed entry gate and allows parking in any outside lot including the Visitor Lot. Prior to the individual receiving this badge, the Contractor must submit form JPL 2190, "Affiliate Start/Separation Notice," to the JPL Security Office. This form is available from the JPL Security Office.
- (g) The Contractor shall notify the JPL negotiator no later than the end of the day of the termination for cause of an authorized Contractor personnel's access. The Contractor shall notify the JPL negotiator and the designated JPL Contract Technical Manager no later than ten days after an authorized Contractor personnel no longer requires access for any other type of termination. Verbal notifications shall be confirmed in writing within thirty days.
- (h) The Contractor must ensure that any forms required for National Agency Checks are completed by the individuals who are to perform work under this Contract as requested by JPL in order to determine eligibility for access to sensitive material or controlled facilities.
- (i) The Contractor shall incorporate this clause in all subcontracts where the requirements identified in paragraph (a) are applicable to performance of the subcontract.

Incorporated documents are available through the "Miscellaneous Contractor Documents" link on the JPL Acquisition Home Page at the following URL:

<http://acquisition.jpl.nasa.gov/e2000.htm>

SERVICE CONTRACT OF 1965, AS AMENDED - LONG FORM

(a) Definitions.

- (1) "Act," as used in this clause, means the Service Contract Act of 1965, as amended (41 U.S.C. 351, et seq.).
- (2) "Contractor," as used in this clause or in any subcontract, shall be deemed to refer to the subcontractor, except in the term "Government Prime Contractor."
- (3) "Service employee," as used in this clause, means any person engaged in the performance of this contract other than any person employed in a bona fide executive, administrative, or professional capacity, as these terms are defined in Part 541 of Title 29, Code of Federal Regulations, as revised. It includes all such persons regardless of any contractual relationship that may be alleged to exist between a Contractor or subcontractor and such persons.

(b) Applicability. This contract is subject to the following provisions and to all other applicable provisions of the Act and regulations of the Secretary of Labor (29 CFR Part 4). This clause does not apply to contracts or subcontracts administratively exempted by the Secretary of Labor or exempted by 41 U.S.C. 356, as interpreted in Subpart C of 29 CFR part 4.

(c) Compensation.

- (1) Each service employee employed in the performance of this contract by the Contractor or any subcontractor shall be paid not less than the minimum monetary wages and shall be furnished fringe benefits in accordance with the wages and fringe benefits determined by the Secretary of Labor, or authorized representative, as specified in any wage determination attached to this contract.
- (2) (A) If a wage determination is attached to this contract, the Contractor shall classify any class of service employee which is not listed therein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination) so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed class of employees shall be paid the monetary wages and furnished the fringe benefits as are determined pursuant to the procedures in this paragraph (c).

(B) This conforming procedure shall be initiated by the Contractor prior to the performance of contract work by the unlisted class of employee. The Contractor shall submit Standard Form (SF) 1444, Request For Authorization of Additional Classification and Rate, to the Institute no later than 30 days after the unlisted class of employee performs any contract work. The Institute shall review the proposed classification and rate and promptly submit the completed SF 1444 (which must include information regarding the agreement or disagreement of the employees' authorized representatives or the employees themselves together with the agency recommendation), and all pertinent information to the JPL resident NASA Contracting Officer. The Contracting Officer shall review the proposed classification and rate, and promptly submit the SF 1444 together with his/her recommendation and all pertinent information, including the position of the institute to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor. The Wage and Hour Division will approve, modify, or disapprove the action or render a final determination in the event of disagreement within 30 days of receipt or will notify the Contracting Officer within 30 days of receipt that additional time is necessary. The Contracting Officer shall promptly notify the Institute upon receipt of communication from the Wage and Hour Division.

(C) The final determination of the conformance action by the Wage and Hour Division shall be transmitted to the Contracting Officer who shall promptly notify the Institute who in turn shall promptly notify the Contractor of the action taken. Each affected employee shall be furnished by the Contractor with a written copy of such determination or it shall be posted as a part of the wage determination.

(D) (i) The process of establishing wage and fringe benefit rates that bear a reasonable relationship to those listed in a wage determination cannot be reduced to any single formula. The approach used may vary from wage determination to wage determination depending on the circumstances. Standard wage and salary administration practices which rank various job classifications by pay grade pursuant to point schemes or other job factors may, for example, be relied upon. Guidance may also be obtained from the way different jobs are rated under Federal pay systems (Federal Wage Board Pay System and the General Schedule) or from other wage

determinations issued in the same locality. Basic to the establishment of any conformable wage rate(s) is the concept that a pay relationship should be maintained between job classifications based on the skill required and the duties performed.

- (ii) In the case of a contract modification, an exercise of an option, or extension of an existing contract, or in any other case where a Contractor succeeds a contract under which the classification in question was previously conformed pursuant to paragraph (c) of this clause, a new conformed wage rate and fringe benefits may be assigned to the conformed classification by indexing (i.e., adjusting) the previous conformed rate and fringe benefits by an amount equal to the average (mean) percentage increase (or decrease, where appropriate) between the wages and fringe benefits specified for all classifications to be used on the contract which are listed in the current wage determination, and those specified for the corresponding classifications in the previously applicable wage determination. Where conforming actions are accomplished in accordance with this paragraph prior to the performance of contract work by the unlisted class of employees, the Contractor shall advise the Contracting Officer of the action taken but the other procedures in subdivision (c)(2)(B) of this clause need not be followed.
 - (iii) No employee engaged in performing work on this contract shall in any event be paid less than the currently applicable minimum wage specified under section 6(a)(1) of the Fair Labor Standards Act of 1938, as amended.
- (E) The wage rate and fringe benefits finally determined under this subparagraph (c)(2) of this clause shall be paid to all employees performing in the classification from the first day on which contract work is performed by them in the classification. Failure to pay the unlisted employees the compensation agreed upon by the interested parties and/or finally determined by the Wage and Hour Division retroactive to the date such class of employees commenced contract work shall be a violation of the Act and this contract.
- (F) Upon discovery of failure to comply with subparagraph (c)(2) of this clause, the Wage and Hour Division shall make a final determination of conformed classification, wage rate, and/or fringe benefits which shall be retroactive to the date such class or classes of employees commenced contract work.
- (3) Adjustment of compensation. If the term of this contract is more than 1 year, the minimum monetary wages and fringe benefits required to be paid or furnished thereunder to service employees under this contract shall be subject to adjustment after 1 year and not less often than once every 2 years, under wage determinations issued by the Wage and Hour Division. The parties to this contract agree that it may be amended, at the discretion of JPL, to incorporate any applicable Wage Determination issued by the Department of Labor pursuant to this AGP. In any such amendment of this contract, the parties will negotiate an equitable adjustment to compensate the Contractor for actual additional costs caused by the applicability of the Act and the Wage Determination, retroactive to the effective date the Wage Determination is made applicable per the terms of the modification incorporating it. The Contractor warrants that the prices set forth in the Contract do not include any allowance for anticipated increases in the Contractor's rates of pay for any of the job classifications listed in the Contract due to anticipated Wage Determinations or revisions or additions to the applicable Wage Determination required for this Contract under the Service Contract Act of 1965.
- (d) Obligation to furnish fringe benefits. The Contractor or subcontractor may discharge the obligation to furnish fringe benefits specified in the attachment or determined under subparagraph (c)(2) of this clause by furnishing equivalent combinations of bona fide fringe benefits, or by making equivalent or differential cash payments, only in accordance with Subpart D of 29 CFR Part 4.
 - (e) Minimum wage. In the absence of a minimum wage attachment for this contract, neither the Contractor nor any subcontractor under this contract shall pay any person performing work under this contract (regardless of whether the person is a service employee) less than the minimum wage specified by section 6(a)(1) of the Fair Labor Standards Act of 1938. Nothing in this clause shall relieve the Contractor or any subcontractor of any other obligation under law or contract for payment of a higher wage to any employee.
 - (f) Successor contracts. If this contract succeeds a contract subject to the Act under which substantially the same services were furnished in the same locality and service employees were paid wages and fringe benefits provided for in a collective bargaining agreement, in the absence of the minimum wage attachment for this contract setting forth such collectively bargained wage rates and fringe benefits, neither the Contractor nor any subcontractor under this contract shall pay any service employee performing any of the contract work

(regardless of whether or not such employee was employed under the predecessor contract), less than the wages and fringe benefits provided for in such collective bargaining agreement, to which such employee would have been entitled if employed under the predecessor contract, including accrued wages and fringe benefits and any prospective increases in wages and fringe benefits provided for under such agreement. No Contractor or subcontractor under this contract may be relieved of the foregoing obligation unless the limitations of 29 CFR 4.1b(b) apply or unless the Secretary of Labor or the Secretary's authorized representative finds, after a hearing as provided in 29 CFR 4.10 that the wages and/or fringe benefits provided for in such agreement are substantially at variance with those which prevail for services of a character similar in the locality, or determines, as provided in 29 CFR 4.11, that the collective bargaining agreement applicable to service employees employed under the predecessor contract was not entered into as a result of arm's length negotiations. Where it is found in accordance with the review procedures provided in 29 CFR 4.10 and/or 4.11 and Parts 6 and 8 that some or all of the wages and/or fringe benefits contained in a predecessor Contractor's collective bargaining agreement are substantially at variance with those which prevail for services of a character similar in the locality, and/or that the collective bargaining agreement applicable to service employees employed under the predecessor contract was not entered into as a result of arm's length negotiations, the Department will issue a new or revised wage determination setting forth the applicable wage rates and fringe benefits. Such determination shall be made part of the contract or subcontract, in accordance with the decision of the Administrator, the Administrative Law Judge, or the Board of Service Contract Appeals, as the case may be, irrespective of whether such issuance occurs prior to or after the award of a contract or subcontract (53 Comp. Gen. 401 (1973)). In the case of a wage determination issued solely as a result of a finding of substantial variance, such determination shall be effective as of the date of the final administrative decision.

- (g) Notification to employees. The Contractor and any subcontractor under this contract shall notify each service employee commencing work on this contract of the minimum monetary wage and any fringe benefits required to be paid pursuant to this contract, or shall post the wage determination attached to this contract. The poster provided by the Department of Labor (Publication WH 1313) shall be posted in a prominent and accessible place at the worksite. Failure to comply with this requirement is a violation of section 2(a)(4) of the Act and of this contract.
- (h) Safe and sanitary working conditions. The Contractor or subcontractor shall not permit any part of the services called for by this contract to be performed in buildings or surroundings or under working conditions provided by or under the control or supervision of the Contractor or subcontractor which are unsanitary, hazardous, or dangerous to the health or safety of the service employees. The Contractor or subcontractor shall comply with the safety and health standards applied under 29 CFR Part 1925.
- (i) Records.
 - (1) The Contractor and each subcontractor performing work subject to the Act shall make and maintain for 3 years from the completion of the work, and make them available for inspection and transcription by authorized representatives of the Wage and Hour Division, Employment Standards Administration, a record of the following:
 - (A) For each employee subject to the Act:
 - (i) Name and address and social security number;
 - (ii) Correct work classification or classifications, rate or rates of monetary wages paid and fringe benefits provided, rate or rates of payments in lieu of fringe benefits, and total daily and weekly compensation;
 - (iii) Daily and weekly hours worked by each employee; and
 - (iv) Any deductions, rebates, or refunds from the total daily or weekly compensation of each employee.
 - (B) For those classes of service employees not included in any wage determination attached to this contract, wage rates or fringe benefits determined by the interested parties or by the Administrator or authorized representative under the terms of paragraph (c) of this clause. A copy of the report required by subdivision (c)(2)(B) of this clause will fulfill this requirement.
 - (C) Any list of the predecessor Contractor's employees which had been furnished to the Contractor as prescribed by paragraph (n) of this clause.

- (2) The Contractor shall also make available a copy of this contract for inspection or transcription by authorized representatives of the Wage and Hour Division.
- (3) Failure to make and maintain or to make available these records for inspection and transcription shall be a violation of the regulations and this contract, and in the case of failure to produce these records, the Institute, upon direction of the Contracting Officer, or the Department of Labor and notification to the Contractor, shall take action to cause suspension of any further payment or advance of funds until the violation ceases.
- (4) The Contractor shall permit authorized representatives of the Wage and Hour Division to conduct interviews with employees at the worksite during normal working hours.
- (j) Pay periods. The Contractor shall unconditionally pay to each employee subject to the Act all wages due free and clear and without subsequent deduction (except as otherwise provided by law or regulations, 29 CFR Part 4), rebate, or kickback on any account. These payments shall be made no later than one pay period following the end of the regular pay period in which the wages were earned or accrued. A pay period under this Act may not be of any duration longer than semi-monthly.
- (k) Withholding of payments and termination of contract. The Institute shall withhold or cause to be withheld from the Contractor under this or any other contract with the Contractor such sums as an appropriate official of the Department of Labor requests or such sums as the Contracting Officer decides may be necessary to pay underpaid employees employed by the Contractor or subcontractor. In the event of failure to pay any employees subject to the Act all or part of the wages or fringe benefits due under the Act, the Institute may after authorization or by direction of the Contracting or the Department of Labor and written notification to the Contractor, take action to cause suspension of any further payment or advance of funds until such violations have ceased. Additionally, any failure to comply with the requirements of this clause may be grounds for termination of the right to proceed with the contract work. In such event, the Government may enter into other contracts or arrangements for completion of the work, charging the Contractor in default with any additional cost.
- (l) Subcontracts. The Contractor agrees to insert this clause in all subcontracts subject to the Act.
- (m) Collective bargaining agreements applicable to service employees. If wages to be paid or fringe benefits to be furnished any service employees employed by the Contractor or any subcontractor under the contract are provided for in a collective bargaining agreement which is or will be effective during any period in which the contract is being performed, the Contractor shall report such fact to the Contracting Officer through the Institute, together with full information as to the application and accrual of such wages and fringe benefits, including any prospective increases, to service employees engaged in work on the contract, and a copy of the collective bargaining agreement. Such report shall be made upon commencing performance of the contract, in the case of collective bargaining agreements effective at such time, and in the case of such agreements or provisions or amendments thereof effective at a later time during the period of contract performance such agreements shall be reported promptly after negotiation thereof.
- (n) Seniority list. Not less than 10 days prior to completion of any contract being performed at a Federal facility where service employees may be retained in the performance of the succeeding contract and subject to a wage determination which contains vacation or other benefit provisions based upon length of service with a Contractor (predecessor) or successor (29 CFR 4.173), the incumbent Contractor shall furnish the Contracting Officer, through the Institute, a certified list of the names of all service employees on the Contractor's or subcontractor's payroll during the last month of contract performance. Such list shall also contain anniversary dates of employment on the contract either with the current or predecessor Contractors of each such service employee. The Contracting Officer shall turn over such list to the successor Contractor at the commencement of the succeeding contract.
- (o) Rulings and interpretations. Rulings and interpretations of the Act are contained in Regulations, 29 CFR Part 4 and are hereby incorporated by reference in this Contract.
- (p) Contractor's certification.
 - (1) By entering into this contract, the Contractor (and officials thereof) certifies that neither it (nor he or she) nor any person or firm who has a substantial interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of the sanctions imposed under section 5 of the Act.
 - (2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract under section 5 of the Act.

- (3) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.
- (q) Variations, tolerances, and exemptions involving employment. Notwithstanding any of the provisions in paragraphs (b) through (o) of this clause, the following employees may be employed in accordance with the following variations, tolerances, and exemptions, which the Secretary of Labor, pursuant to section 4(b) of the Act prior to its amendment by Pub. L. 92-473, found to be necessary and proper in the public interest or to avoid serious impairment of the conduct of Government business:
- (1) Apprentices, student-learners, and workers whose earning capacity is impaired by age, physical or mental deficiency, or injury may be employed at wages lower than the minimum wages otherwise required by section 2(a)(1) or 2(b)(1) of the Act without diminishing any fringe benefits or cash payments in lieu thereof required under section 2(a)(2) of the Act, in accordance with the conditions and procedures prescribed for the employment of apprentices, student-learners, handicapped persons, and handicapped clients of sheltered workshops under section 14 of the Fair Labor Standards Act of 1938, in the regulations issued by the Administrator (29 CFR Parts 520, 521, 524, and 525).
 - (2) The Administrator will issue certificates under the Act for the employment of apprentices, student-learners, handicapped persons, or handicapped clients of sheltered workshops not subject to the Fair Labor Standards Act of 1938, or subject to different minimum rates of pay under the two acts, authorizing appropriate rates of minimum wages (but without changing requirements concerning fringe benefits or supplementary cash payments in lieu thereof), applying procedures prescribed by the applicable regulations issued under the Fair Labor Standards Act of 1938 (29 CFR Parts 520, 521, 524, and 525).
 - (3) The Administrator will also withdraw, annul, or cancel such certificates in accordance with the regulations in 29 CFR Parts 525 and 528.
- (r) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed and individually registered in a bona fide apprenticeship program registered with a State Apprenticeship Agency which is recognized by the U.S. Department of Labor, or if no such recognized agency exists in a State, under a program registered with the Bureau of Apprenticeship and Training, Employment and Training Administration, U.S. Department of Labor. Any employee who is not registered as an apprentice in an approved program shall be paid the wage rate and fringe benefits contained in the applicable wage determination for the journeyman classification of work actually performed. The wage rates paid apprentices shall not be less than the wage rate for their level of progress set forth in the registered program, expressed as the appropriate percentage of the journeyman's rate contained in the applicable wage determination. The allowable ratio of apprentices to journeymen employed on the contract work in any craft classification shall not be greater than the ratio permitted to the Contractor as to his entire work force under the registered program.
- (s) Tips. An employee engaged in an occupation in which the employee customarily and regularly receives more than \$30 a month in tips may, if not prohibited by applicable State law, have the amount of these tips credited by the employer against the minimum wage required by section 2(a)(1) or section 2(b)(1) of the Act, in accordance with section 3(m) of the Fair Labor Standards Act and Regulations, 29 CFR Part 531. However, the amount of credit shall not exceed \$1.34 per hour beginning January 1, 1981. To use this provision:
- (1) The employer must inform tipped employees about this tip credit allowance before the credit is utilized;
 - (2) The employees must be allowed to retain all tips (individually or through a pooling arrangement and regardless of whether the employer elects to take a credit for tips received);
 - (3) The employer must be able to show by records that the employee receives at least the applicable Service Contract Act minimum wage through the combination of direct wages and tip credit; and
 - (4) The use of such tip credit must have been permitted under any predecessor collective bargaining agreement applicable by virtue of section 4(c) of the Act.
- (t) Disputes concerning labor standards. The U.S. Department of Labor has set forth in 29 CFR Parts 4, 6, and 8 procedures for resolving disputes concerning labor standards requirements. Such disputes shall be resolved in accordance with those procedures and not the Disputes clause of this contract. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

WAIVER OF FACILITIES CAPITAL COST OF MONEY

The Contractor did not include facilities capital cost of money as a proposed cost of this Contract. Therefore, it is an unallowable cost under this Contract.

EXHIBIT 1

DEEP SPACE NETWORK OPERATIONS AND MAINTENANCE CONTRACT

CONTRACT DATA REQUIREMENTS LIST (CDRL)

CONTRACT NO. TBD

DOCUMENT CHANGE LOG

Date	Sections Changed	Reason for Change	Revision
2/13/2003	Entire Document		Rev 0 draft
3/06/2003	Entire Document	Incorporates information that became available after the draft was published, such as proposal addenda or responses to requests for clarification.	Rev 0
3/21/2003	DRD M004, M005, and M006	Minor changes for clarification; no substantive changes.	Rev 1

EXHIBIT 1: DELIVERABLE DOCUMENTATION

The documentation deliverable under this Contract is summarized in the following Contract Data Requirements List (CDRL), which identifies the items to be delivered, when delivery is required, the quantity and type of each item, and the frequency of issue. The Data Requirement Description (DRD) forms referenced in the CDRL describe the specific requirements for the item(s) to be delivered, reference documents, and other instructions as to content, format and preparation.

The following shall apply to all submittals:

Non-Design Document Identification

The Contractor shall display on the cover or title page of all deliverable non-design documentation (all documents except drawings and specifications) the following minimum information:

1. Document title
2. Contractor's name
3. Contract number
4. Document number (JPL and/or Contractor assigned)
5. Subsystem or support equipment name
6. Approval signatures - Contractor and JPL; two (2) spaces for JPL signatures
7. Project identification: Deep Space Network Operations and Maintenance, CEF-567818
8. Documents containing information pertaining to a subsystem or its support equipment shall use the applicable subsystem or support equipment reference designation number
9. Date of issue or publication
10. CDRL line item and DRD numbers
11. Revision or change identification

CDRL alphanumerically listed by the following disciplines:

- M Management
- OPS Operations

The following data type designations are used for all DRD's:

- 1 Document requires JPL approval.
- 2 Document requires JPL concurrence
- 3 Document requires Contractor approval or concurrence.

TABLE OF DRDs

DRD#	Title	Date
Management		
M001	Contract Transition Plan	
M002	Schedules	
M003	Work Breakdown Structure and Dictionary	
M004	Baseline Cost Estimate	
M005	NASA Financial Reports	
M006	Performance Assessment Reports	
M007	Wage/Salary and Fringe Benefit Data	
M008	Program Status Reviews and Reports	
M009	Safety, Health, and Environmental Plan	
M010	Systems Safety Plan	
M011	Emergency Preparedness and Disaster Recovery Plan	
M012	Security Management Plan	
M013	Administrative Information Technology Security Plan	
M014	Real Property Plan	
M015	Government Property Management Plan	
M016	Program Integration Plan	
M017	Risk Management Plan	
M018	Annual Operating Plan (AOP)	
M019	Facility Project Reporting Requirements	
M020	Training and Certification Plan	
M021	Performance Metrics	
Operations		
OPS001	Mission Event Readiness Review Materials	
OPS002	Network Operations Plan	
OPS003	Network and Services Utilization Data	
OPS004	Technical Reports	
OPS005	Compatibility Test Reports	

CONTRACT TRANSITION PLAN

Data Requirements Description

DRD No. M001

Issue RFP

Data Type 1

Date Revised

Description/Use

Document the Contractor's Transition Plan.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

Draft with proposal; final version at contract award.

Submission Frequency

Updates as required.

Data Preparation Information

Scope

1. The DSN Operations and Maintenance Transition Plan provides plans for the transfer of all anticipated operations activities to the contractor along with supporting logic and rationale.

Applicable Documents

1. None

Contents

1. The Transition plan shall describe the overall plan for transition. As a minimum, it shall address:
 - a. Schedule with key milestones
 - b. Approach and rationale for implementing the plans, procedures, and processes required for performance of the contract, including property, personnel, facilities, and security
 - c. Metrics used to determine progress for contract transition
 - d. Property control transfer
 - e. Facilities responsibility transfer
 - f. Licenses and permits transfer
 - g. Operations continuity
 - h. Security considerations
 - i. Classified document control transfer
 - j. Risk mitigation strategy

- k. Configuration management considerations
- l. Safety, Health, and Environmental responsibility transfer

SCHEDULES

Data Requirements Description

DRD No. M002

Issue RFP

Data Type 1

Date Revised

Description/Use

Track performance of the work specified in the contract.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

Draft 60 days after assumption of responsibility.

Submission Frequency

Report is due not later than (10) working days following the close of the contractor's monthly accounting period, unless otherwise specified in the contract.

Data Preparation Information

Scope

1. The Contractor shall prepare resource loaded schedules that portray the plan for accomplishing all of the activities necessary to meet the requirements of the Statement of Work within the time constraints imposed by the performance and delivery schedule of the contract. The schedules shall include activities of subcontractors and all documentation deliverables required in this exhibit. All schedule items shall be traceable to the WBS.
2. After approval of the Initial schedules by the DSMS Operations Program Office, the schedules shall be baselined. Changes to these schedules shall be approved by the CTM. Monthly updates to the schedules shall reflect any progress the contractor has made toward accomplishing the scheduled activities.

Applicable Documents

1. Task Description Document

Contents

1. The detailed schedule shall portray the following information for each of the contractor's lowest-level activities
 - a. Activity description
 - b. WBS cross-reference number
 - c. Planned start date
 - d. Planned completion date

- e. Forecast start date
 - f. Forecast completion Date
 - g. Actual start date
 - h. Actual completion date
 - i. Critical path shall be defined by a distinctive marking
 - j. Resources
2. The contractor shall be responsible for establishing the schedule interdependencies among the lowest-level activities.

WORK BREAKDOWN STRUCTURE (WBS) AND DICTIONARY

Data Requirements Description

DRD No. M003

Issue RFP

Data Type

Date Revised

Description/Use

The Work Breakdown Structure (WBS) and Dictionary establishes the basic framework within which all effort necessary to meet the requirements of the Contract is identified and defined. It provides the logical structure for planning and controlling costs

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

Draft version with proposal; final at assumption of responsibility.

Submission Frequency

Initial, with updates as required.

Data Preparation Information

Scope

1. The purpose of the Work Breakdown Structure is to provide a logical framework that organizes program budgets and schedules. It shall be presented in both tabular and graphic form.

Applicable Documents

1. None.

Contents

1. The lowest level of the WBS shall correspond to at least the lowest level at which work scheduled, work accomplished and actual costs can be compared. This level shall be agreed upon during contract negotiations. The WBS shall be coded to establish the relationship among all of its levels. The established coding shall be used to identify each particular WBS Item on all program budgets, schedules and financial reports. The WBS shall indicate which Items require monthly financial reporting.
2. A WBS Dictionary shall be prepared to define each Item of the WBS. These definitions shall describe the work to be performed, the criteria for completing the work, the organization responsible for the work and the major deliverable(s) involved (if applicable).

Maintenance

After the initial delivery, changes shall be incorporated as required for negotiated contract changes.

BASELINE COST ESTIMATE

Data Requirements Description

DRD No. M004

Issue RFP

Data Type 1

Date Revised

Description/Use

The Baseline Cost Estimate is a time-phased cost and schedule plan for the entire length of Contract performance. It is the key element of financial planning and management of the Contract and is used as the basis for performance measurement.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

With proposal; final with Final Proposal Revision

Submission Frequency

As required by the JPL Contract Negotiator.

Data Preparation Information

Scope

1. The Baseline Cost Estimate submitted by the Contractor establishes the cost plan associated with the work scheduled for performance measurement.

Applicable Documents

1. None.

Contents

1. The initial total baseline cost estimate shall reflect the original negotiated contract cost value and shall serve as a confirmation of negotiations. A revision to the baseline cost estimate shall reflect all negotiated and definitized changes. There shall be a baseline estimate for each report item (Level 2) of the Work Breakdown Structure summarized at the total program. If the Contractor uses a management reserve approach, the management reserve shall be identified as a separate report item. Each report item baseline shall be broken down into cost elements through G&A and time-phased by month.
 - a. For all authorized and negotiated changes there shall be time-phased by month, cost estimate for all new or affected Report Items similar to those required for the original contract in order that the baseline shall be current.
 - b. The baseline cost estimate shall be revised as a result of a negotiated change in scope.

Maintenance

After the initial delivery, changes shall be incorporated as required for negotiated contract changes.

NASA 533 FINANCIAL REPORTS

Data Requirements Description

DRD No. M005

Issue RFP

Data Type 1

Date Revised

Description/Use

The Financial Reports provide cost status for Contract monitoring and control.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

NASA Form 533M – No later than 30 days after incurrence of cost.

NASA Form 533Q - No later than 90 days after incurrence of cost.

Submission Frequency

533M – Monthly, no later than the 10th operating day following the close of the contractor's accounting period.

533Q- Quarterly, no later than the 15th day of the calendar month preceding the quarter being reported.

Data Preparation Information

Scope

1. The Report shall provide data on accumulated costs and funding projections for the contract.

Applicable Documents

1. NPG 9501.2
2. NASA Form 533M
3. NASA Form 533Q

Contents

1. The NASA Form 533M report shall be completed in accordance with instructions in NPG 9501.2. A 533M shall be prepared at Level 2 of the WBS. Reporting categories on each 533M shall be the elements of cost (e.g. labor hours, labor dollars, overhead, material, subcontracts, other direct cost, G&A, cost of money) and profit or fee.
2. The NASA Form 533Q report shall be completed in accordance with instructions in NPG 9501.2, adjusted for a monthly submittal. A 533Q shall be prepared at Level 2 of the WBS. Reporting categories on each 533Q shall correspond with those required for the 533M. The NASA Form 533Q is due on a quarterly frequency not later than the 15th day of the month preceding the quarter being reported in columns 8.a, 8.b. and 8.c. (e.g. The report for quarter beginning July is due no later than June 15).

WAGE/SALARY AND FRINGE BENEFIT DATA

Data Requirements Description

DRD No. M007

Issue RFP

Data Type 3

Date Revised

Description/Use

The Wage/Salary and Fringe Benefit Data will be used by the Contract Negotiator and the Industrial Labor Relations Office to provide the necessary data for submittal of Standard Form (SF) 98, Notice of Intention to Make a Service Contract and Response to Notice, to the Department of Labor, and to assist in the monitoring of Service Contract Act compliance.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

With proposal.

Submission Frequency

Annually, on September 30

Data Preparation Information

Scope

1. The Wage/Salary and Fringe Benefit Data must be submitted by the contractor, and any subcontractors, which are subject to the provisions of the Service Contract Act, to the Contracting Federal Agency. In accordance with FAR regulations 22.1007 and 22.1008, the Contract Negotiator is required to submit a SF 98 to the Department of Labor, Wage and Hour Division.

Applicable Documents

1. FAR 22.1007
2. FAR 22.1008
3. FAR 52.222-41

Contents

1. The Wage/Salary and Fringe Benefit Data shall contain the data included in the enclosed DRD forms, titled "Wage/Salary Rate Information", "Fringe Benefit for Service Employees", and Fringe Benefits per Collective Bargaining Agreement". The Wage/Salary Rate Information shall contain a listing of all exempt and nonexempt labor classifications working on the contract. Separate forms shall be utilized for classifications working in different geographic areas and for each subcontractor. Wage determination numbers, appropriate labor organization names, and subcontractor names, must be reflected. All nonexempt labor classifications must be matched to

wage determination classes or to CBA classifications for represented classes. Annotate exempt or nonexempt and union or nonunion. The current hourly rates shall reflect the actual lowest and highest paid employees, along with a computed average rate. State the number of employees working in each labor category. Separate Fringe Benefit forms shall be completed for non-represented classifications and for each separate CBA. A separate form must be completed for the prime and each subcontractor. Three copies of each Collective Bargaining Agreements are required.

Format

1. The Wage/Salary and Fringe Benefit Data shall be in a format substantially the same as enclosed with this DRD. (Forms 2, 3, and 3A)

Maintenance

Reissue annually.

FORM 2

WORK SHEET FOR SF-98 DATA
WAGE RATE INFORMATION

CONTRACTORS LABOR	WAGE	EXEMPT OF	UNION OR	CURRENT	MYE NO OF
<u>CLASSIFICATION</u>	<u>DETERMINATION</u>	<u>NONEXEMPT</u>	<u>NONUNION</u>	<u>HOURLY</u>	<u>EMPLOYEES</u>
	<u>CLASSIFICATION</u>			<u>RATE</u>	
Illustration of required data:					
Project Manager	Not Required	E	N	\$25.00	1
Supervisor	Not Required	E	N	\$20.00	1
Electrical Engineer	Not Required	E	N	\$16.50 - \$20.00	3
Technician, Jr	Elect Tech Main I	N	U	\$12.78 - \$15.50	12
Technician, Sr	Elect Tech Main II	N	U	\$18.20 - \$20.00	4
Secretary	Secretary I	N	N	\$11.11 - \$12.50	2
File Clerk	General Clerk II	N	N	\$8.29	1
Clerical Data Entry	Word Processor I	N	N	\$9.25 - \$10.90	3

Submit data in the above illustrated format for all labor classifications used, or planned to be used, on this contract.

All contractor labor classifications must be matched to wage determination classes listed in CBA's represented classes or classes shown in WD 94-2516 for nonrepresented classes.

CONTRACTORS LABOR	WAGE	EXEMPT OF	UNION OR	CURRENT	MYE NO OF
<u>CLASSIFICATION</u>	<u>DETERMINATION</u>	<u>NONEXEMPT</u>	<u>NONUNION</u>	<u>HOURLY</u>	<u>EMPLOYEES</u>
	<u>CLASSIFICATION</u>			<u>RATE</u>	

FORM 3

Page 1 of 2

FRINGE BENEFITS PER COLLECTIVE BARGAINING AGREEMENT

For period from _____ to _____

Contractor:

Contract Number:

Number of employees in bargaining unit _____

Total number of employees on contract _____

1. Shift Differential: (Describe any pay over and above base rates for 2nd, 3rd, weekend, or other shifts.)

2. Health and Welfare Items and Other Fringe Items: (Indicate whether or not coverage is provided to employees and state current average hourly cost per employee covered by a Collective Bargaining Agreement.)

Item	Coverage Provided (Yes or No)	Average Hourly Cost
a. Life Insurance		
b. Accidental Death		
c. Disability		
d. Medical and Hospital		
e. Dental		
f. Retirement Plan		
g. Savings/Thrift Plan		
h. Sick Leave		
i. Tuition		
j. Other (Describe)		
TOTAL		

3. Paid Absences:

	Service Requirement	Days per Year
a. Vacation		
b. Holiday		
c. Sick Leave		
d. Jury Leave		
e. Funeral Leave		
f. Military Leave		
g. Other (Describe)		

4. Severance Pay: (Briefly describe terms and amounts.)

5. Other Fringe Benefits: (Describe any other fringe benefits not included above, and show average hourly cost.)

6. Premium Pay: (Discuss all premium pay provisions not previously shown on this form.)

Signature of Company Representative

Date

FORM 3A

Page 1 of 1

FRINGE BENEFITS FOR SERVICE EMPLOYEES

For Period from _____ to _____

Contractor:

Number of nonexempt employees on contract: _____

Total number of employees on contract: _____

1. Health and Welfare Items and Other Fringe Items:
(Indicate whether or not coverage is provided to employees and state current average hourly cost per service employee.)

<u>Item</u>	<u>Coverage Provided</u>	<u>Average Hourly Cost</u>
a. Life Insurance		
b. Accidental Death		
c. Disability		
d. Medical & Hospital		
e. Dental		
f. Retirement Plan		
g. Savings/Thrift Plan		
h. Sick Leave		
i. Tuition Reimbursement		
j. Other (Describe)		

2. Paid Absences

Service Requirement Days per Year

- | | |
|---------------------|--|
| a. Vacation | |
| b. Holidays | |
| c. Sick Leave | |
| d. Jury Leave | |
| e. Funeral Leave | |
| f. Military Leave | |
| g. Other (Describe) | |

Signature of Company Representative_____
Date

PROGRAM MANAGEMENT REVIEWS (PMR) AND REPORTS

Data Requirements Description

DRD No. M008

Issue RFP

Data Type 3

Date Revised

Description/Use

Define requirements for supporting status reviews and generating reports.

Distribution

DSMS Operations Program Office

Initial Submission

30 days after contract award

Submission Frequency

Weekly and Monthly

Data Preparation Information

Scope

1. Report status of Contractor activities in performing contractual obligations.

Applicable Documents

1. None

Contents

1. Report contents shall be as follows:
 - a. Weekly Reports shall include the following:
 - i. Major accomplishments.
 - ii. Missed milestones.
 - iii. Critical events supported.
 - iv. Implementation of engineering changes.
 - v. Any metrics applicable to the reporting period.
 - vi. Plans for next reporting period
 - vii. Major issues and concerns.
 - b. The PMR package shall include the following:
 - i. Requirements Status
 - ii. Metrics
 - iii. Key Engineering Changes
 - iv. Action Item Status
 - v. Major Accomplishments; Missed Accomplishments; Critical Events Forecast

- vi. Schedule Status; Budget Status; Workforce Status
- vii. Procurement Status; Subcontractor Status
- viii. Plans for Next Month
- ix. Major issues & Concerns
- x. Updated action Item status summary.

Format

1. PMR: DSMS Specified format. Weekly: Contractor format is acceptable.

SAFETY, HEALTH, AND ENVIRONMENTAL PLANS

Data Requirements Description

DRD No. M009

Issue RFP

Data Type 1

Date Revised

Description/Use

Describes the Contractor's Safety, Health, and Environmental Plans

Distribution

Formatting and distribution per the Contracting Negotiator's letter. Contractor format is acceptable; electronic availability required.

Initial Submission

Draft version 30 days after contract award.

Submission Frequency

Annually, as required by this DRD, or upon request

Data Preparation Information

Scope

1. Describes the Contractor's approach to establishing, managing, maintaining effective Safety, Health and Environmental Programs to protect personnel, equipment and the environment.
 - a. Policy. Safety, Health, and Environmental policy statements will be included in the plan.
 - b. Authority and Accountability. The plans will state that they will be maintained as required to be consistent with applicable NASA requirements and contractual direction as well as applicable JPL requirements and Federal, state, and local regulations. The plans will include a statement from the Contractor Manager or designated program officials indicating that the plans will be implemented as approved by JPL, and that the program official will take personal responsibility for their implementation.
 - c. Management Structure. Clearly define line and staff responsibilities for safety, health, and environmental protection. Identify any other personnel or organizations that provide safety, health or environmental services or exercise any form of control or assurance in these areas. State the means of communication and interface concerning related issues used by line, staff, and others (such as documentation, concurrence requirements, committee structure, multi-employer sharing of the work site or other special responsibilities and support). The JPL cognizant offices are the JPL Environmental Affairs Program

Office, the Occupational Safety Program Office, and the Systems Safety Program office.

- d. Safety, Health, and Environmental Programs Management. Identify all personnel assignments and basic techniques to be applied to accomplish these program goals. As a minimum, the following details shall be provided:
 - i. Assignment of specific roles and responsibilities to individuals by title. The following information will be provided as a minimum: Designated Safety and Health and Environmental Officials (or equivalent). Identify by title the official(s) responsible for implementation of these plans.
 - ii. Identification of methods to ensure that written procedures are developed for all hazardous operations, including testing, maintenance, repairs, and handling of hazardous materials and hazardous waste. Wherever possible, JPL procedures shall be used. Procedures will be developed in a format suitable for use as safety documentation (such as a safety manual).
 - iii. Describe the Contractor's training program including identification of responsibility for training employees to assure understanding of safe work practices, hazard recognition, and appropriate responses including protective and/or emergency countermeasures. Address management techniques used to identify and utilize training resources (such as asbestos worker training/certification, hazard communication, etc.) as appropriate with particular emphasis on programs designed for the multi-employer work environment on NASA property.
 - iv. Assignments, procedures, and frequency for regular inspection and evaluation of work areas for hazards and accountability for implementation of corrective measures. The Contractor has the option, in lieu of this detail, to identify policies and procedures with the stipulation that the results (including findings) of inspections conducted on NASA property or involving Government furnished property will be documented in Contractor self evaluations, risk evaluations, or the monthly Accident/Incident Summary reports.
 - v. Identification of methods to ensure the reporting and investigation of mishaps and close calls and corrective actions implemented to prevent recurrence. Discuss use of NASA Form 1627 and alternate forms used by Contractor with emphasis on timely notification of JPL; investigation procedures; exercise or jurisdiction over a mishap investigation involving JPL, Contractor and other subcontractor personnel; follow up of corrective actions; communication of lessons learned to JPL; and solutions to minimize duplications in reporting and documentation including use of alternate forms, etc. Discuss requirements for immediately

- notifying JPL cognizant offices—including Office 930—of injuries, fires, hazardous materials releases, and other emergencies.
- vi. Establishment of administrative procedures and responsibilities for emergency preparedness plans and procedures.
 - vii. Participation in the review, updating, and modifications of safety requirements identified in this plan including any referenced documents therein. This review activity will be implemented at the direction of the CTM, as coordinated with Office 530 manager, and in accordance with established NASA directives and procedures.
 - viii. Management techniques and criteria used to determine the need for safety engineering tasks and the methods for identification and control of hazards associated with work performed. All safety engineering products which address operations, equipment, etc., on NASA property will be subject to JPL review and concurrence.
- e. Procurement and Contract Safety. Identify procedures used to assure that procurements are reviewed for safety considerations and that specifications contain appropriate safety criteria and instructions. Set forth authority and responsibility to assure that safety tasks are clearly stated in subcontracts.
- f. Hazardous Materials, Hazardous Items, and Hazardous Waste
- i. Hazardous Material. State what controls over procurement, storage, issuance, and use of hazardous materials are currently in place. Describe method by which material safety data will be provided to JPL. Describe method of establishing, maintaining, and reporting monthly to JPL cognizant offices on inventories of chemicals.
 - ii. Potentially Hazardous Items. Describe how the controls over procurement, storage, issuance, and use of potentially hazardous items operate. Identify any training/certification requirements as appropriate. State method by which hazards associated with potentially hazardous items will be documented and provided to the CTM and JPL cognizant offices. Potentially Hazardous Items are defined as “An end item, element, system, subsystem, article, or component with the potential for exposure of personnel, facilities, equipment, or the environment to hazards arising from performance of work, use, handling, manufacturing, packaging, transportation, storage, inspection, or disposal.”
 - iii. Hazardous Waste. Set forth controls over the generation, storage, handling, and disposal of hazardous waste. Identify training/certification requirements as appropriate. Where possible, JPL procedures shall be used.
- g. Hazardous Operations. Establish methods for notification of personnel when hazardous operations are to be performed in their facilities or

when hazardous conditions are found to exist during the course of this contract. Develop and maintain a list of hazardous operations to be performed during the life of this contract. The list of hazardous operations will be provided to JPL as part of the Safety Plan for review and approval. JPL and the Contractor will decide jointly which operations are to be considered hazardous, with JPL as the final authority. Before hazardous operations commence, the Contractor will develop a schedule to perform the following and submit it for JPL concurrence:

- i. Hazardous Operations Procedures. Written hazardous operations procedures will be developed and approved for all hazardous operations with particular emphasis on identifying the job safety steps required. The Contractor may implement this requirement as follows:
 - ii. Identify Contractor policies and procedures for management and implementation of hazardous operations procedures together with a statement that JPL will have access on request to any Contractor data necessary to verify implementation; or,
 - iii. in lieu of the Contractor management and development of such procedures, identify the method whereby the Contractor will identify and submit such procedures to the CTM and JPL cognizant offices for review and approval.
- h. Training and Certification. A training and certification program will be developed and implemented for personnel involved in hazardous operations such as confined space entry and lockout/tagout. Set forth procedures for training and certification of personnel who will perform tasks, which have been determined to be hazardous by the Contractor. Certifications shall include documentation that training requirements and physical conditions have been satisfied by one or more of the following: physical examination, testing, on-the-job performance, etc. All training materials and training records will be provided for JPL review on request.
- i. Hazardous Operations Permits. Identify the following permits:
 - i. Operations Involving Toxic Materials or Health Hazards. Set forth method by which onsite work exposures related to potentially toxic or health hazardous chemical or physical agents will be identified. Such operations must be evaluated by the JPL Occupational Health Office and must be properly controlled as advised by the same. The CTM must be notified prior to initiation of any new or modified operation potentially hazardous to health.
 - ii. Operations Involving Hazardous Waste. Identify procedures used to manage hazardous waste from point of generation through disposal. Whenever possible, JPL procedures shall be used. Clearly identify divisions of responsibility between Contractor and JPL for hazardous waste generated throughout the life of the

- contract. Operations, which occur, on GDSCC and other Contractor-controlled property must be evaluated by the JPL Environmental Affairs Office and must be properly controlled as advised by same. The CTM and JPL Environmental Affairs Office must be notified prior to initiation of any new or modified hazardous waste operation performed pursuant to this Contract.
- iii. Operations Involving New or Modified Emissions/Discharges to the Environment. Set forth methods for identifying new or modified emissions/discharges and coordinating results with the CTM and JPL Environmental Affairs Office. Emphasis shall be placed on providing for sufficient lead-time for processing permits through the appropriate state agency and/or the Environmental Protection Agency.
 - j. Fire Prevention. Set forth administrative requirements and procedures for control of and regularly scheduled inspections for fire and explosion hazards.
 - k. Pollution Prevention. Set forth procedures to minimize or eliminate environmental pollution. Address management of hazardous materials; substitution of non-hazardous or less hazardous materials for hazardous materials; proper segregation of hazardous wastes from non-hazardous wastes; and other methods required by local, regional, state and federal authorities. Indicate compliance with NASA and agency requirements.
 - l. Protective Equipment. Set forth procedures for obtaining, inspecting, and maintaining protective equipment, as required, or reference written procedure pertaining to this subject. Describe approach to training personnel in the proper use and care of protective equipment. Set forth methods for keeping records of such inspections and maintenance programs.
 - m. Risk Evaluation. The Contractor shall state responsibility and procedures to determine the significance, intrinsic worth, and criticality of the Contractor operations in a manner that proper risk management techniques can be applied and notable safety risk reported to the appropriate Health, Safety, and Environmental program offices. The Contractor will discuss ranking the risk in a severity classification. Risk evaluation will apply to the operations and products of the Contractor's operation. The approach to identifying and implementing specific risk evaluation tasks, managing the risks, and documenting the results will be discussed. The cognizant JPL offices will concur with the Contractor's risk determination.
 - n. Self Evaluations and Reporting. Set forth responsibilities and methods for internal audits and evaluations of the overall safety, health, and environmental program. Identify personnel who conduct the audit and evaluation, to which the report is made, and the frequency (at least

annually) with which it is performed. These evaluations shall include subcontracted tasks

- o. Site Specific Requirements. Address the following for all work performed at any location pursuant to this Contract.
 - i. Safety, Health and Environmental Standards Enforcement. Describe the means to be employed to monitor and enforce these standards. The plans shall include the Contractor's standards and criteria for imposing safety, health and environmental standards upon its subcontractors and JPL subcontractors of any tier, and JPL personnel working at a Contractor-operated facility. Plans and procedures for monitoring compliance with such standards shall be submitted. Standards. The following safety, health and environmental standards, specifications, issuances, and reporting requirements are prescribed:
 - 1.o.i.1. General Standards and Specifications: The Contractor shall comply with applicable provisions of the Occupational Safety and Health Standards of the Occupational Safety and Health Act of 1970, Rules and Regulations of the Department of Labor issued pursuant thereto and regulations of states provided for under the Act. The Contractor is required to comply with safety requirements established by the State of California but will use NPD 8710.2, NASA Safety and Health Program Policy, as a general policy guide.
 - 1.o.i.2. Environmental Matters: Environmental controls shall be in accordance with applicable NASA and other Federal, State, and local regulatory requirements and in accordance with applicable Executive Orders of the President. The Contractor shall comply with NPD 8500.1 NASA Environmental Management.
 - 1.o.i.3. Safety and Health Matters: The Contractor shall develop an injury and illness prevention program (IIPP), per CCR Title 8, General Industry Safety Order, Section 3203. The program shall be reviewed and approved by JPL cognizant offices and the CTM. The Contractor shall also prepare a site-specific safety plan. The Contractor shall furnish reports within 24 hours of individual incidents, accidents, or property damage. Reporting shall be per NPG 8621.1.
 - ii. Illness, Incident, and Injury Experience Reports. The following illness, incident, and injury experience reports are prescribed:
 - 1.o.ii.1. Experience Reports: The Contractor shall annually prepare and submit to the JPL cognizant offices and the CTM reports of occupational related illness, incidents, injury, and lost-time experience.
 - 1.o.ii.2. Investigative Reports: The Contractor shall furnish reports of investigation of individual incidents or accidents

in formats approved by the CTM, provided, however, that the Contractor shall not be required to furnish personally identifiable information concerning Contractor or subcontractor employees.

1.o.ii.3. The Contractor shall immediately notify and furnish such other reports as the CTM and Contract Negotiator determine to be related to the Contractors' safety and health program and its experiences hereunder.

1.o.ii.4. Nothing herein shall be construed as diminishing the Government's rights pursuant to this contract.

Applicable Documents

1. DOL OSHA Standards, 29 CFR 1910 & 1926
2. CCR Title 8 General Industrial Safety Orders
3. CFR 1910.1096 Federal/OSHA on Ionizing Radiation Exposure
4. CFR 1910.97 Occupational Safety and Health Standards, Occupational and Environmental Control, Non-Ionizing Radiation
5. NPG 1800.1 NASA Occupational Health Program
6. NPG 1820.1 Hearing Conservation
7. NPG 8820.3 Pollution Prevention
8. NPG 8830.1 Affirmative Procurement Plan for Environmentally Preferable Products
9. NPG 8580.1 Implementing the National Environmental Policy Act and Executive Order 12114.
10. NPD 1820.1 NASA Environmental Health Program
11. NPD 8500.1 NASA Environmental Management
12. NPD 8621.1 NASA Mishap and Close-Call Reporting, Investigating, and Recordkeeping Policy
13. NPD 8700.1 NASA Policy for Safety and Mission Success
14. NPD 8710.2 NASA Safety and Health Program Policy
15. NPD 8710.5 NASA Safety Policy for Pressure Vessels and Pressurized Systems
16. NFPA Fire Code (NFPA Standards)
17. Resource Conservation and Recovery Act (RCRA) and associated local-agency requirements
18. Clean Air Act and associated local-agency requirements
19. Endangered Species Act
20. National Historic Preservation Act
21. Executive Orders

Contents

1. Cover page to include signatures of Contractor's project manager and designated safety official (if different); CTM and Contract Negotiator.

2. Table of Contents
3. Body of plan as required (Contractor's format acceptable).

Maintenance

Reissues upon request.

SYSTEM SAFETY PLAN

Data Requirements Description

DRD No. M010

Issue RFP

Data Type 1

Date Revised

Description/Use

Describes the System Safety Plan (SSP) to be used at GDSCC that will be used to assess all activities for hazards to personnel, critical hardware and facilities.

Distribution

Formatting and distribution per the Contracting Negotiator's letter.

Initial Submission

Draft 30 days after contract award. Final at assumption of responsibility.

Submission Frequency

Annual review, with updates as required.

Data Preparation Information

Scope

1. The elements of a System Safety Plan (SSP) as outlined below are generic; refer to the appropriate applicable references listed above for specific program requirements. The elements of this plan shall include: testing, operations, system modification, implementation, and maintenance; assessment of hazards to personnel, hardware and facilities in each of these activities; risk management process; and monitoring of all activities performed on site.

Source Documents

1. The initial issue of the documents cited herein (including those of any applicable amendments and revisions) shall be as reflected in the contract schedule.

Applicable Documents

1. NPD 8700.1 NASA Policy for Safety and Mission Success
2. NPD 8710.1 Emergency Preparedness Program
3. NPD 8710.2 NASA Safety and Health Program Policy
4. NPG 8715.2 NASA Emergency Preparedness Procedures and Guidelines

Contents

1. Contractor format is acceptable; electronic format and availability as required by CTM.
2. System Safety Engineering Organization. The SSP shall describe:

- a. The system safety organization or function within the organization of the contract including charts to show the organizational and functional relationships and lines of communication.
 - b. The responsibility, authority, and accountability of system safety personnel and other Contractor organizational elements (including subcontractors) involved in the system safety effort. Identify the authority in regard to resolution of all identified hazards. Include the title, address, and telephone number of the System Safety Manager.
 - c. The staffing of the system safety organization including workforce loading and qualifications of assigned key personnel.
 - d. The procedures by which the Contractor will integrate and coordinate the system safety efforts. Include methods of dissemination of system safety requirements to action organizations and subcontractors; coordination of subcontractors' system safety programs; integration of hazard analyses; management and engineering reviews; program status reporting; and the identities and charters of any system safety groups.
 - e. The process through which Contractor management decisions will be made to include notification and subsequent actions for the following: critical and catastrophic hazards; corrective actions taken; mishaps or malfunctions; waivers to safety requirements; and program deviations.
 - f. The interfaces between the system safety organization and all other applicable disciplines such as Engineering, Occupational Safety and Health, Reliability, Quality Assurance, Medical Support (JPL, Contractor, subcontractor).
3. System Safety Requirements. The SSP shall:
 - a. Describe or reference the methods that will be used to identify and apply hazard control requirements and criteria for the operation of equipment, software, and facilities. List the safety standards and system specifications that are the sources of system safety requirements with which the Contractor either is required to comply or intends to adopt as a requirement.
 - b. Describe the risk assessment procedures including the hazard severity categories, hazard probability (or frequency) levels, and the precedence to be followed in satisfying safety requirements. State any qualitative or quantitative measures of system safety that the Contractor will meet, including a description of the acceptable risk levels. Include system safety definitions that are in addition to those in NASA documents.
 - c. Describe the management controls that shall be used to ensure compliance or justify waivers and deviations with general design and operational safety criteria and the closed loop procedures to ensure hazard resolution and control.
4. Hazard Analyses. The SSP shall describe:

- a. The analysis techniques and format that will be used in qualitative and quantitative analysis to identify hazards, their causes and effects, and recommended corrective actions.
 - b. The depth to which each analysis technique will be used within the system, operation, or scenario being analyzed. This description will include identification of hazards associated with the system, subsystem, components, personnel, support equipment, government furnished equipment, facilities, and their interrelationships in the logistics support, training, maintenance, transportability, operational environments, and phase out or disposal.
 - c. The integration of subcontractor hazard analyses and techniques within the Contractor hazard analyses.
 - d. The techniques to be used to establish a single closed loop tracking system.
5. System Safety Data. The SSP shall:
 - a. Describe the approach for researching, disseminating, and analyzing pertinent historical hazard or mishap data.
 - b. Identify system safety related reports and describe the processes for delivery to JPL and the retention of data by the Contractor.
6. Safety Verification and Audits. The plan shall describe:
 - a. Procedures for ensuring that the objectives and requirements of the system safety plan have been adequately demonstrated and implemented.
 - b. Procedures for ensuring feedback of system safety-pertinent information for management and engineering review and analysis.
 - c. The review procedures established by the Contractor's system safety organization to ensure safe conduct of hazardous tests.
7. Training. Describe techniques and procedures to be used by the Contractor to ensure that the objectives and requirements of the system safety plan are implemented in training for engineers, technicians, operators, and support (including maintenance) personnel.

Maintenance

Changes shall be incorporated by change pages or complete reissue.

EMERGENCY PREPAREDNESS AND DISASTER RECOVERY PLAN

Data Requirements Description

DRD No. M011

Issue RFP

Data Type 1

Date Revised

Description/Use

To describe the Contractor's approach for emergency preparedness and disaster recovery.

Distribution

Formatting and electronic distribution per the Contract Negotiator's letter.

Initial Submission

30 days after assumption of responsibility.

Submission Frequency

Updates as required

Data Preparation Information

Scope

1. The Disaster Recovery Plan shall identify critical facilities/systems that require backup or alternate sites.

Applicable Documents

1. NPD 8710.2 NASA Safety and Health Program Policy
2. NPD 8710.1 Emergency Preparedness Program
3. NPG 8715.2 NASA Emergency Preparedness Procedures and Guidelines
4. DSMS 801-202 DSMS Operations Contingency Plan

Contents

1. The Disaster Recovery Plan shall include, as applicable, the following: a risk analysis of all critical facilities/systems; identification of specific equipment/facilities that require backup or alternate sites; identification of backup strategies; emergency response plans; backup facility/alternate sites operating plans.

Maintenance

Changes shall be incorporated by change pages or complete reissue.

SECURITY MANAGEMENT PLAN

Data Requirements Description

DRD No. M012

Issue

Data Type 1

Date Revised

Description/Use

The Security Management Plan will describe the Contractor's approach for meeting and maintaining security throughout the facilities under its control.

Distribution

Formatting and electronic distribution per the Contract Negotiator's letter.

Initial Submission

Draft 30 days after contract award; final at assumption of responsibility.

Submission Frequency

Initial, with updates as required.

Data Preparation Information

Scope

1. The plan will address the security requirements for facilities, systems, equipment, personnel, information, and communications, as well as and Secure Operations Procedures. This plan establishes the security procedures, Government/Contractor relationships and assigns responsibilities for all physical, personnel, and IT security required for the activity specified in the TDD. The plan is applicable to both Contractor and subcontractor personnel.

Applicable Documents

1. FAR 52.204-2
2. NISPOM National Industrial Security Program Operating Manual
3. Executive Order 12958: National Security Information
4. National Security Decision Memorandum (NSDM) 119
5. Export Administration Regulations (EAR)
6. NPD 1600.2 NASA Security Policy
7. NPG 1620.1 Security Procedures and Guidelines
8. NPD 2810.1 Security of Information Technology
9. Presidential Decision Directives
10. International Traffic and Arms Regulation (ITAR)
11. JPL D-7155 JPL IT Security Requirements for Computer Systems

12. JPL D-7223 JPL IT Security Requirements for Computer Users
13. JPL D-23140 DSMS IT Security Policy
14. JPL D-17896 DSMS IT Security Requirements

Contents

1. The management structure, processes and reporting requirements, techniques and formats must be established, defined, and documented to ensure adequate visibility and insight for the JPL Security Office and the CTM. The Security Management Plan shall include:
 - a. A description of the Contractor's security management structure and assignment of responsibilities.
 - b. The approach for integrating security requirements into functions as described in the TDD, including interfacing with subcontractors.
 - c. Identification of the security interfaces with JPL, NASA, DOD, and other government agencies, and subcontractors.
 - d. Compliance with NPG 1620.1, Security Procedures and Guidelines and the NASA Resources Protection (NRP) Program.
 - e. Description of the reporting and logging processes, procedures, and mechanisms for security related incidents.
 - f. Description of visitor control at GDSCC including escort of foreign nationals (without national agency checks) and logging of all visitors.
 - g. Description of the security baseline configuration management program.
 - h. The methodology for obtaining certifications and re-certifications.
 - i. Process for developing security implementation plans as requested by JPL for new/expanded systems/facilities and security programs.

Note: The IT Security Plan shall be a separate DRD.

Maintenance

Changes shall be incorporated by change pages or complete reissue.

ADMINISTRATIVE IT SECURITY PLAN

Data Requirements Description

DRD No. M013

Issue RFP

Data Type 1

Date Revised

Description/Use

Describes the contractor's administrative IT security plan.

Distribution

Formatting and electronic distribution per Contract Negotiator's letter.

Initial Submission

Draft 60 days after contract award; final at assumption of responsibility.

Submission Frequency

IT asset inventory updates quarterly; Annual IT Security Plan review by JPL and DSMS IT Security at fiscal year end; Submission of IT Security Plan for Approval to Process by JPL and DSMS IT Security every three years (NASA requirement). Next Approval to Process cycle is in FY04.

Data Preparation Information

Scope

1. The IT Security Plan shall include all nonflight, Contractor-owned IP devices (routers, switches, workstations, printers, remote access).

Applicable Documents

1. JPL D-23140, DSMS Information Technology Security Policy
2. JPL D-17896, DSMS Information Technology Security Requirements for Computer Systems
3. JPL D-7155, JPL IT Security Requirements for Computer Systems
4. JPL D-7223, JPL IT Security Requirements

Contents

1. Contents in compliance with the preceding applicable documents.

Maintenance

Changes shall be incorporated by change pages, complete reissue, or electronic equivalent.

REAL PROPERTY MANAGEMENT PLAN

Data Requirements Description

DRD No. M014

Issue RFP

Data Type 14

Date Revised

Description/Use

The Real Property Management Plan will be used to provide insight into the Contractor's approach for managing real property responsibilities.

Distribution

Per the CTM's direction.

Initial Submission

Draft 30 days after assumption of responsibility.

Submission Frequency

Updated by August 1 of each year.

Data Preparation Information

Scope

1. The Real Property Management Plan shall describe the Contractor's approach to managing facility responsibilities pursuant to this Contract. It shall include a 5-year plan that identifies the facility projects required, regardless of ultimate fund source, for each year for the five fiscal years beginning three years from the commencement date of the current fiscal year. This plan shall document Contractor processes and implementation approach for real property management to include environmental compliance and restoration requirements.

Applicable Documents

1. NPD 7730.1 Approval Authorities for Facilities Projects
2. NPD 8800.14 Policy for Real Property Management
3. NPD 8820.1 Design and Construction of Facilities
4. NPG 8800.15 Real Estate Management Program Implementation Manual
5. NPG 8820.2 Facility Project Implementation Handbook

Contents

1. The plan shall identify the Contractor approach to the coordination of real property responsibilities and budget priorities to optimize maintenance, repair, and replacement projects for facilities and facility systems and environmental compliance and restoration requirements across GDSCC. Provide a real property management plan that will encompass facility space

utilization planning and integrated facility project planning and reporting requirements. The management structure, processes and reporting requirements, techniques and formats must be established and/or defined and documented to insure adequate visibility and insight for the DSMS Operations Program Office.

The plan shall also address the following:

- a. Process for environmental assessments and permit applications for constructed and modified facilities and processes.
- b. Process to insure facility system and as-built drawings are kept current for Contractor generated changes and all changes are incorporated as required. Contractor shall self-audit the drawing process with the results reported annually.
- c. Incorporation of local Government facility project approval process and standardization requirements that are in place at GDSCC, if the proposed facility project could have impact on Fort Irwin.
- d. Propose general guidelines to establish boundaries or limits of acceptable facility actions that may be accomplished without CTM involvement. These guidelines must be approved by the CTM prior to use.
- e. Process and management structure to implement facility projects.
- f. Completion milestone definitions for management and reporting of projects.
- g. Procedure to allow for in-progress audit and final evaluation of project completion and documentation.
- h. Plan for conducting a facility condition assessment.
- i. Process for the regular submittal of updates to the real property records.

Maintenance

Updated annually or as required by change page or new revision.

GOVERNMENT PROPERTY MANAGEMENT PLAN

Data Requirements Description

DRD No. M015

Issue RFP

Data Type 14

Date Revised

Description/Use

Text

Distribution

To describe the method of administering Government property.

Initial Submission

Draft 60 days after assumption of responsibility.

Submission Frequency

Initial, with updates as required.

Data Preparation Information

Scope

1. The Government Property Management plan defines the Contractor's use, maintenance, repair, protection, and preservation of Government property. It shall describe the Contractor's approach to receiving, handling, stocking, maintaining, protecting, issuing, and dispositioning Government property.

Applicable Documents

1. Federal Acquisition Regulation (FAR) Part 45
2. NASA FAR Supplement (NFS) Part 1845
3. NPG 4100.1 NASA Materials Inventory Management Manual
4. NPG 4200.1 NASA Equipment Management Manual
5. NPD 7500.1 Program and Projects Logistics Policy
6. NPD 8800.14 Policy for Real Property Management

Contents

1. This plan shall consist of those procedures that constitute the Contractor's Property Management Manual and shall include at a minimum the following categories:
 - a. Property Management
 - b. Acquisition
 - c. Receiving
 - d. Identification
 - e. Records
 - f. Movement
 - g. Storage
 - h. Physical Inventories
 - i. Reports
 - j. Consumption
 - k. Utilization
 - l. Maintenance Records with Financial
 - m. Subcontractor Control Records
 - n. Disposition
 - o. Contractor Closeout
 - p. Reconcile Contractor
 - q. Disposal

Maintenance

Changes shall be incorporated by change pages or complete reissue.

PROGRAM INTEGRATION PLAN

Data Requirements Description

DRD No. M016

Issue RFP

Data Type 1

Date Revised

Description/Use

Used to document the Contractor's plan integrating the resources required for preparing for mission events, supporting major implementation activities, and performing contractual activities in a cost effective way. Also provides the Contractor's strategic plan for future years' activities.

Distribution

Formatting and electronic distribution per the JPL CTM's direction.

Initial Submission

Draft 30 days after assumption of responsibility; final 60 days after assumption of responsibility.

Submission Frequency

Annual update, as part of the POP process.

Data Preparation Information

Scope

1. The Program Integration Plan describes the Contractor's annual plan and schedule for supporting all contractual activities and provides a strategic plan for future years' activities.

Applicable Documents

1. None

Contents

1. The Program Integration Plan shall describe how the Contractor will integrate resources across the contract to ensure that all required mission events, implementation support requirements and other activities are to be performed. The Contractor shall:
 - a. Provide a detailed schedule and plan for the current fiscal year (and all years for which the information is available) which includes milestones for key mission activities, critical mission events, and implementation activities along with contractor activities required to support them such as reviews , tests, training and documents, resource assignments and costs.
 - b. Provide a strategic plan, spanning at least the two fiscal years after the current POP fiscal year, which will include activities to be supported, schedules, personnel and other resource requirements and costs..

Maintenance

Update as required.

RISK MANAGEMENT PLAN

Data Requirements Description

DRD No. M017

Issue

Data Type 1

Date Revised

Description/Use

Document the contractor's Risk Management Plan.

Distribution

Formatting and electronic distribution per Contracting Negotiator's letter.

Initial Submission

Draft 45 days after assumption of responsibility; final 90 days after assumption of responsibility.

Submission Frequency

Update the plan quarterly.

Data Preparation Information

Scope

1. The Risk Management Plan provides a process for identifying, evaluating, and reporting risks.

Applicable Documents

1. NPG 8000.4 Risk Management Procedures and Guidelines
2. JPL D-15951 Risk Management Handbook for JPL Projects

Contents

1. The Risk Management Plan shall include at least the following:
 - a. An analysis of the state of the DSN at regular intervals to identify risks.
 - b. A prioritized list of risks and anticipated risks.
 - c. Strategies to mitigate or remediate these risks.
 - d. Implementation plan approved by the DSMS Operations Program Office.
 - e. Plan for documenting closure of risk items.
 - f. A lessons-learned database.

Maintenance

Update quarterly.

ANNUAL OPERATING PLAN

Data Requirements Description

DRD No. M018

Issue RFP

Data Type 1

Date Revised

Description/Use

Document the Contractor's plan to perform contractual obligations.

Distribution

Formatting and electronic distribution per the JPL CTM's direction.

Initial Submission

Draft 60 days after contract award; final upon assumption of responsibility.

Submission Frequency

Each year, a first draft 30 calendar days after the receipt of the CTM's written technical and cost guidelines for preparing the Annual Operating Plan. The CTM will provide the guidelines annually in March. The final AOP shall be provided upon completion of final negotiations.

Data Preparation Information

Scope

1. The Annual Operating Plans (AOPs) developed by the Contractor and approved by the DSMS Operations Program Office Manager and CTM shall be an umbrella document intended to encompass and integrate the entire scope of the Contract requirements. The AOP shall include current FY, plus a five-year projection.

Applicable Documents

1. None.

Contents

1. The AOPs shall include, but not necessarily be limited to, the following:
 - a. An Executive Summary that addresses the management structure being applied to this Contract, the major goals of the coming year and the major recommendations being proposed in the AOP.
 - b. A detailed technical discussion, in the format of the TDD, following the structure of the work breakdown structure (WBS).
 - c. A thorough discussion, with supporting rationale, of each proposed addition of new Tasks or the modification/deletion of existing tasks.
 - d. A complete cost plan at the lowest WBS level, including labor at the full time equivalent (FTE) level, hourly rates, materials, G&A, and ODC in the detail required by the DSMS Operations Program Office.

- e. A discussion of proposed process improvements projected for the coming year.
- f. A detailed discussion of the proposed savings.
- g. An update of all plans and reports since the last AOP submission.
- h. Five-year cost projection.

Maintenance

Update as required.

FACILITY PROJECT REPORTING REQUIREMENTS

Data Requirements Description

DRD No. M019

Issue RFP

Data Type 2

Date Revised

Description/Use

The facility project reports will be used to provide insight into the scope, cost, schedule, and performance of facility projects.

Distribution

Per the CTM's direction.

Initial Submission

Not applicable.

Submission Frequency

As required.

Data Preparation Information

Scope

1. The project requirements documents shall be provided in sufficient detail to allow for an independent cost estimate of all scope and related issues identified to accomplish the project. The other project documentation shall be submitted for each facility project as required.

Applicable Documents

1. NPD 7730.1 Approval Authorities for Facilities Projects
2. NPD 8800.14 Policy for Real Property Management
3. NPG 8800.15 Real Estate Management Program Implementation Manual
4. NPD 8820.1 Design and Construction of Facilities
5. NPG 8820.2 Facility Project Implementation Handbook

Contents

1. The Contractor shall submit facility project documentation and reporting as follows:
 - a. Facility projects greater than \$50K and less than \$500K (for documentation purposes).
 - b. NASA Form 1509 and 1510 (prior to project start).
 - c. Facility projects greater than \$500K.
 - d. Facility project description, justification and cost estimate (NASA Form 1509, 1510) annually and as required for revisions/updates).

- e. Project requirements document (include all requirements and costs associated with a completed project).
- f. Flash bid reports (NASA Form 1579) (after bid opening).
- g. Facilities Project Implementation Schedule (after award of project).
- h. Final acceptance certificate including a recap of all funding (after project completion).
- i. Facility projects greater than \$5M (in addition to the above reporting requirements).
- j. Project Management Plan (prior to design start).
- k.
- l. Facility Project Pre-Advertisement Review Checklist (NASA Form 1580) (after design completion/prior to advertisement).
- m. A Facilities Construction Completion Report shall be submitted no later than thirty (30) days following the financial completion of the facility project and transferred to appropriate Center's real property records for accountability.

Maintenance

Project documentation shall be updated as required.

TRAINING AND CERTIFICATION PLAN

Data Requirements Description

DRD No. M020
Data Type 2

Issue RFP
Date Revised

Description/Use

The Training and Certification Plan is used to document the details of the Contractor’s plan to provide a trained and certified workforce to perform activities pursuant to this contract.

Distribution

Formatting and electronic distribution per the JPL CTM’s direction.

Initial Submission

Draft with proposal; final 60 days after contract award.

Submission Frequency

Updates as required.

Data Preparation Information

Scope

1. The Training and Certification Plan describes the Contractor’s plan to train and certify its workforce. This plan includes both general training (safety, security, ethics, etc.) and specific training and certification.

Applicable Documents

1. None.

Contents

1. The Training and Certification Plan shall describe how the Contractor intends to ensure that its personnel are thoroughly trained and certified to perform their assigned tasks. The Contractor shall:
 - a. Describe the training and certification process for operations personnel, including link controllers, tracking support specialists, operations chief, and other real-time operations personnel; mission support engineers; and test engineers.
 - b. Describe the training and certification process to ensure that maintenance personnel are qualified to maintain and repair all assigned equipment, facilities and tooling.
 - c. Describe the training and certification process to ensure that personnel are qualified to operate the assigned equipment including heavy vehicles.

- d. Describe the training and certification process to ensure that personnel are qualified to work under special work conditions (confined space, elevated work platforms, etc.).

Maintenance

Update as required.

PERFORMANCE METRICS

Data Requirements Description

DRD No. M021

Issue RFP

Data Type 2

Date Revised

Description/Use

Performance metrics used to assess DSN system performance, network utilization, and quality of customer service.

Distribution

Formatting and electronic distribution per the CTM's direction.

Initial Submission

30 days after assumption of responsibility.

Submission Frequency

Monthly, by the 15th of the month following the reporting period, or by special request of the CTM.

Data Preparation Information

Scope

1. Metrics required to assess system performance, network utilization and quality of customer service, including link analysis, FTS analysis, special reports and performance trends.

Applicable Documents

1. None.

Contents

1. Provide metrics such as those that describe system availability (i.e., numbers of DRs by subsystem and DSS, lost data, degraded data, network utilization by hours and percentages).

Maintenance

Update monthly.

MISSION EVENT READINESS REVIEW MATERIALS

Data Requirements Description

DRD No. OPS001

Issue RFP

Data Type 1

Date Revised

Description/Use

Document the contractor's Mission Event Readiness Review requirements.

Distribution

Formatting and electronic distribution per the DSN Operations Manager.

Initial Submission

First scheduled MERR after the assumption of responsibility.

Submission Frequency

A draft 15 working days and a final 5 working days before the first scheduled MERR.

Data Preparation Information

Scope

1. Provide information concerning DSMS configuration, spacecraft configuration, trajectory data, link analysis, sequence of events, and the Contractor's assessment of the DSMS readiness to support a mission critical event.

Applicable Documents

1. DSMS 841-001

Contents

1. The report provides the status of mission-related personnel training and highlights any problems and their corrective action. It shall also give the status of mission-related testing and highlight any system or subsystem problems and their corrective actions. Any schedule conflicts shall also be identified. Finally, the report shall state the contractor's assessment of the DSMS readiness to support the mission.

Maintenance

Update as required by the MERR board or DSMS Operation Program Office.

NETWORK OPERATIONS PLAN

Data Requirements Description

DRD No. OPS002

Issue RFP

Data Type 1

Date Revised

Description/Use

Documents the planning data, configurations, and procedures necessary to support all phases of each mission.

Distribution

Formatting and electronic distribution as specified by the Contractor and as concurred by the DSMS Operations Manager.

Initial Submission

Draft version 10 working days before the first test and training activity or 180 calendar days before the first MERR, as agreed to by the DSMS Operations Program Office.

Submission Frequency

A revised document is to be submitted whenever there are changes exceeding the threshold specified in DSMS 810-001. The document is updated as required through end of mission.

Data Preparation Information

Scope

1. This report is to cover all operational elements of the DSMS, including the overseas tracking stations located in Canberra and Madrid.

Applicable Documents

1. Detailed Mission Requirements (DMR) document

Contents

1. Mission description, mission unique system configurations, critical event planning, procedures and training plans, analysis and supporting data link margins based on spacecraft and ground station capabilities. It shall also include nominal and contingency plans and procedures for all spacecraft mission phases.

Maintenance

Changes shall be incorporated by change pages or complete reissue.

NETWORK AND SERVICES UTILIZATION DATA

Data Requirements Description

DRD No. OPS003

Issue RFP

Data Type N/A

Date Revised

Description/Use

This document contains a description and the Contractor's collection and presentation of network and services utilization data of the Deep Space Network (DSN).

Distribution

Hard copies and electronic distribution and formatting as required/specified by the RAPSO Manager.

Initial Submission

30 days after assumption of responsibility.

Submission Frequency

Utilization data updated monthly within 5 working days of the end of the reporting month.

Data Preparation Information

Scope

1. To capture the utilization of the DSN by customer, subnet, and antenna on a monthly basis.

Applicable Documents

1. None.

Contents

1. Contains utilization data associated with scheduled and actual DSN usage for each customer.

Maintenance

1. Changes shall be incorporated by change pages or complete reissue.
 - a. A monthly radiometric report that has the following column headings: Project Name (Customer), Number of Tracks, Predicted Signal Levels (70-m, dbm), Declination (Degree), Right Ascension (Degree), Sun Earth Probe Angel (Degree), Distance From Earth (mil. Km.), Distance From Sun (mil. Km.) Round Trip Light Time (RTLT)
 - b. A monthly subnet utilization report by antenna across the top with the following columns, Work Code, Project Name, and for each antenna in the subnet, Hours Used by the Project and Percent usage for the month.
 - c. A monthly pie chart report for each subnet (34-HEF, 34-BWG1, 34-BWG2, 70-Meter, and 26-Meter) and the whole DSN that shows

utilization on the subnet or on the DSN for the month by Work Category.

- d. A monthly stacked-bar-chart report showing by Project (customer) usage hours of the DSN with each subnet used in a different color.
- e. A monthly bar chart report showing total hours from the most tracked to the least tracked project.
- f. A year-to-date tracking report by month in the FY on each subnet for each customer. The structure shall have the months in the FY across the top with the customer down the length of the report. Each customer shall be classified as either HEO, LEO, or DS, and shall have their utilization hours further sub-divided by subnet (26M, HEF, BWG, HSBW, or 70M). Totals by subnet for each customer for the year shall be included.
- g. A monthly report highlighting events and work that occurred during the month and work or events expected in the coming month.

TECHNICAL REPORTS

Data Requirements Description

DRD No. OPS004
Data Type As specified

Issue RFP
Date Revised

Description/Use

To provide periodic reports for evaluation of the technical status of the DSN.

Distribution

Formatting and electronic distribution per the requestor.

Initial Submission

As requested.

Submission Frequency

As requested.

Data Preparation Information

Scope

1. Establishes the activity reporting for the Contractor's progress and accomplishments as well as performance and utilization of facilities/systems.

Applicable Documents

1. None.

Contents

1. Regular DRD Technical Reports

	Title	Frequency	Type	WBS
1	Significant Events	Weekly	2	1.1 Contract Management
2	System Safety Status of Findings in Response to Audits	As Required	2	1.1.4 System Safety
3	Annual and Special Energy and Environmental	Annually and as Required	1	2.1.5 Energy and Water Management
4	Facilities Functional Performance Metrics	Monthly		2.5 Facilities and Infrastructure Maintenance and Construction/Modification
5	Daily Status Report	Daily	2	3.1.1.1 Real-Time Operations Control and Monitoring
6	Circuit Performance/Usage	Monthly	2	3.1.1.3 Central Communications

				Terminal Operations
7	Network Maintenance Capabilities/Equipment Status	Annually	2	3.2.4 Network Maintenance Support
8	Network Spare Status a. Antenna Maintenance b. Data Systems	Monthly	2	4.1 DSN Engineering
9	Antenna Microwave System Performance	Monthly	2	4.1.3 Antenna Microwave Network Engineering

2. Other technical reports as requested and approved by the CTM.

Maintenance

Changes shall be incorporated by change pages or complete reissue.

COMPATIBILITY TEST REPORTS

Data Requirements Description

DRD No. OPS005

Issue RFP

Data Type 1

Date Revised

Description/Use

Document the results of spacecraft RF compatibility tests with DTF-21, CTT-22, or MIL-71

Distribution

Formatting and electronic distribution as specified by the Contractor and as concurred by the DSMS Operations Manager.

Initial Submission

As required, 30 calendar days after the completion of testing.

Submission Frequency

Update as required by retests

Data Preparation Information

Scope

- 1. Includes all results of spacecraft compatibility testing as documented in 814-005 (DSN Flight Interface Compatibility Test Design Handbook, SVE Policies and Practices) and the Project compatibility test plan.

Applicable Documents

- 1. DSMS 814-005
- 2. Project compatibility test plans.

Contents

- 1. Summaries of all test activities in both graphical and text format. The document shall include: the tests performed, test criteria, and actual results.

Maintenance

Update as required by retests.

Exhibit 3. Transition Standard of Excellence Metrics for Performance Measurement Effective 1 October 2003 through 31 December 2003 (Part 1)

Category	Metric	Below Expectation	Meets Expectation	Exceeds Expectation
DRDs	DRDs delivered and JPL accepted as required by the CDRL	Late on required DRD dates specified in the CDRL	Meet required DRD delivery dates specified in the CDRL	N/A
Staffing	Key Staff are dedicated and staffed to the DSN O&M Contract	100% after 1 Oct 2003	100% on 1 Oct 2003	N/A
	Percentage of accepted job offers	< 90% of the positions are staffed on 1 Jan 04	90% of the Positions are staffed on 1 > 90% of the positions are staffed on 1 Jan 04	
	Percentage of accepted job offers for identified critical positions	< 95% of the critical positions are staffed on 1 Jan 04	95% of the Positions are staffed on 1 > 95% of the critical positions are staffed on 1 Jan 04	
	Signed union agreement in place	Signed CBA after 1 December 2003	Signed CBA by 1 December 2003	Signed CBA by 1 November 2003
Transition	Acceptable contract transition plan	Transition Plan is delivered after 1 Oct 2003	Final Transition Plan is complete per N/A DRD M001 - 1 Oct 2003	N/A
	Signed Southern California Edison Contract for GDSCC	Complete after 1 Jan 2004	Complete by 1 Jan 2004	Complete by 1 Dec 2003
	Signed contracts for required consumables are in place: e.g diesel, unleaded fuel, LN2, and cafeteria supplies	Complete after 1 Jan 2004	Complete by 1 Jan 2004	Complete by 1 Dec 2003
	Completed Vendor Maintenance Contracts	Complete after 1 Jan 2004	Complete by 1 Jan 2004	Complete by 1 Dec 2003
	Complete Facility Lease Agreements	Complete after 15 Dec 2003	Complete by 15 Dec 2003	Complete by 1 Dec 2003
	Required Administrative Systems are in place and operational: e.g. Computers, Office Equipment, X500, contractor badging	Complete after 1 Jan 2004	Complete by 1 Jan 2004	N/A
	Arrangements for commuter vehicle and 150 high lift capability are in place.	Complete after 1 Jan 2004	Complete by 1 Jan 2004	Complete by 1 Dec 2003
	Secure all required S/W Licenses	Complete after 1 Jan 2004	Complete by 1 Jan 2004	Complete by 15 Dec 2003
	Secure all required environmental permits	Complete after 1 Jan 2004	Complete by 1 Jan 2004	Complete by 15 Dec 2003
	Initial transfer of Operational Databases	Complete after 15 Dec 2003	Complete by 15 Dec 2003	Complete by 1 Dec 2003
	Transfer Local Operating Procedures and Work Instructions	Complete after 15 Dec 2003	Complete by 15 Dec 2003	Complete by 1 Dec 2003
	Communications infrastructure and IT security in place between JPL and contractor leased facilities.	Complete after 15 Dec 2003	Complete by 15 Dec 2003	Complete by 1 Dec 2003
	Secure ITAR exemptions	Complete after 1 Jan 2004	Complete by 1 Jan 2004	N/A
HS&E	Recordable Injury/Illness Frequency Rate	Rate is higher than 1.75	Maintains a rate at 1.75.	Maintains a rate of 1.66 or less

JPL reserves the right to initiate renegotiation of the Standard of Excellence metrics if required at any time during the performance of this contract.

**Exhibit 3. Transition Standard of Excellence Metrics for Performance Measurement Effective
1 October 2003 through 31 December 2003 (Part 2)**

DSN Operations & Maintenance Contract

Award Term & Award Fee Determination

Areas Of Emphasis (AOE) Ratings

Excellent Very Good Adequate Poor

Standard of Excellence (SOE) Metrics	Exceeds	100% AF +6 m	2/3 AF +6 m	1/3 AF +0 m	0 AF 0 m
	Meets	100% AF +0 m	2/3 AF + 0 m	1/3 AF +0 m	0 AF -6 m
	Below	0 AF -6 m	0 AF - 6 m	0 AF - 6 m	0 AF - 6 m

Exhibit 4. Standard of Excellence Metrics for Performance Measurement (Part 1)

Category	Metric	Below Expectation	Meet Expectation	Exceed Expectation	Notes
Cost	Fiscal Year end deviation from Plan	Over plan or greater than 3% under the plan	Between -1% to 3% of the plan.	- 0 to -1% of the plan.	The Annual Operating Plan approved at the beginning of fiscal year. Plan changes if any during the year must be approved by JPL, this will then form the new baseline plan. The AOP will also change based on approved cost efficiencies proposed by the contractor.
Critical Event Support					
Data Delivery		Responsible for the loss of any required data as specified in the Detailed Mission Requirements (DMR) document for any Level 1 or Level 2 critical event	Provide required data as specified in the DMR for all Level 1 and Level 2 critical event	Exceed data requirements as specified in the DMR for all Level 1 and Level 2 critical event and/or responds rapidly and successfully to unexpected conditions	DSN standard operating plan 841-001 contains the definitions for Level 1 and Level 2 critical events. Applies only to the contractor's area of responsibility
Safety Health & Environment					
Recordable Injury/Illness Frequency Rate		Rate is higher than the contractor's average Standard Industry Classification (SIC) Code	Maintains a rate at the contractor's average SIC Code.	Maintains a rate of 5% below or lower than the contractor's average SIC Code.	As agreed to by JPL and the contractor based on the contractor's average SIC Code and as documented in the annual operation plan (AOP).

Exhibit 4. Standard of Excellence Metrics for Performance Measurement (Part 1)

Category	Metric	Below Expectation	Meet Expectation	Exceed Expectation	Notes
GDSCC Performance	Service Availability				The network availability performance is derived from actual performance from 1997 thru July 2002. Applies to operational transferred capability only. Performance is a monthly average.
		Telemetry < 96%	96% to 98.5%	> 98.5%	
		Tracking < 96%	96% to 98.5%	> 98.5%	
		Command < 96%	96% to 98.5%	> 98.5%	
		Radio Science < 96%	96% to 98.5%	> 98.5%	
		VLBI < 96%	96% to 98.5%	> 98.5%	
Network Operations	Backlog Maintenance and Repair (BMAR) Facility BMAR's Worse than current BMAR baseline		Maintain current BMAR baseline	5% annual reduction in BMAR	Baseline is the BMAR at transition.
Network Operations	Support Product error rate	Open GDSCC Discrepancy Reports (DR)	Greater than 150 open DR's	75 to 150 open DR's	Monthly Average
		Loss of critical mission event due to support products or a rate of greater than 4 per month for routine operations	Support products cause no loss of critical events and an average error rate of 4 per month for routine operations	Support products cause no loss of critical events and an average error rate of 2 per month for routine operations	Support products are: all predicts, sequence of events, configuration tables, and tracking schedules

Exhibit 4. Standard of Excellence Metrics for Performance Measurement (Part 1)

Category	Metric	Below Expectation	Meet Expectation	Exceed Expectation	Notes
Network Readiness	Successful and timely completion of Mission Event Readiness Reviews (MERR's)	Does not meet DRD (OPS-001) requirements or have a major Request for Action (RFA) opened that results in a Delta Review	Meet DRD (OPS-001) requirements and have no major RFA's	Exceeds DRD (OPS-001) requirements by greater than 10 working days and have no major RFA's	Applies only to RFA's written against the contractor's area of responsibility
	Compatibility Test Reports	Does not meet DRD (OPS-005) requirements	Meet DRD (OPS-005) requirements	Distribution of Test Report 10 working days before DRD (OPS-005) requirements	
	Certification of employees requiring certification	Less than 80% of required employees	80% to 90% of required employees	90% to 100% of required employees	
	Network Operations Plans (NOP)	Does not meet DRD (OPS-002) requirements	Meet DRD (OPS-002) requirements	Distribution of NOP 10 working days before DRD (OPS-002) requirements	

Exhibit 4. Standard of Excellence Metrics for Performance Measurement (Part 1)

Category	Metric	Below Expectation		Meet Expectation	Exceed Expectation	Notes
		Expectation	Expectation			
Network Engineering	Timeliness of Accurate Discrepancy Report Analysis	Greater than 60 days	45 to 60 days	Less than 45 days	Perform analysis and isolate performance trends. Monthly Average	
	Adherence to Product Development/Deployment Schedules	Behind plan or major liens requiring a Delta DSMS Delivery Review (DDR).	Design, Test, and Delivery Reviews per Plan.	Reviews per Plan and no open transfer liens at time of DDR.	Plan baselined after JPL approval	
	Timeliness of response to queries from DSCC's	More than 1 working day of receipt of request or resolution greater than 7 working days	Within 1 working day of receipt of request and resolution within 7 working days	Within 8 hours of receipt of request	Receipt at start of or during the working day.	
Logistics	Modification Kit handling efficiency- Cycle time	Priority 3 Greater than 5 working days	4 to 5 working days	3 working days or less	Applies from the time a complete Modkit is delivered to the contractor for processing.	
		Priority 2 Greater than 72 hours	Within 72 hrs with no errors	Within 48 hours with no errors	Applies from the time a complete Modkit is delivered to the contractor for processing.	

Exhibit 4. Standard of Excellence Metrics for Performance Measurement (Part 1)

Category	Metric	Below		Exceed		Notes
		Expectation	Meet Expectation	Expectation	Expectation	
Property	Property Accountability	Lose more than 0.26 percent of GFE property items or 0.26 percent of total GFE property value	Lose between 0.26 percent and 0.05 percent of total GFE property items or property value	Lose less than 0.05 percent of total GFE property items or property value		
	Maximum Allowable Loss	Lose any single item with value greater than \$100K	N/A	N/A		

JPL reserves the right to initiate renegotiation of the Standard of Excellence metrics if required at any time during the performance of this contract.

Exhibit 4. Standard of Excellence Metrics for Performance Measurement (Part 2)

DSN Operations & Maintenance Contract

Award Term & Award Fee Determination

Areas Of Emphasis (AOE) Ratings

Excellent Very Good Adequate Poor

100% AF +6 m	2/3 AF +6 m	1/3 AF +0 m	0 AF 0 m
100% AF +0 m	2/3 AF + 0 m	1/3 AF +0 m	0 AF -6 m
0 AF -6 m	0 AF - 6 m	0 AF - 6 m	0 AF - 6 m

Exceeds

Standard of
Excellence
(SOE) Meets

Metrics
Below

DESIGNATION OF AUTHORIZED REPRESENTATIVES

JPI 1817 R 4/99



JPL D-25796

Operations and Maintenance of the Deep Space Network

Task Description Document

Deep Space Network

**National Aeronautics and
Space Administration**

**Jet Propulsion Laboratory
California Institute of Technology
Pasadena, California**

March 21, 2003

Operations and Maintenance of the Deep Space Network

Task Description Document

Deep Space Network

JPL D-25796

March 6, 2003

Prepared by:

 9-27-03

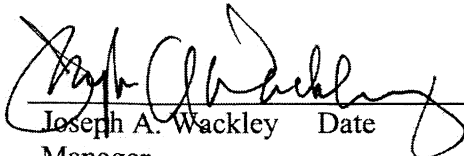
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Document Change Log

Date	Sections Changed	Reason for Change	Revision
2/14/2003	Entire Document		Rev 0 draft
3/06/2003	Entire Document	Incorporates information that became available after the draft was published, such as proposal addenda or responses to requests for clarification.	Rev 0
3/21/03	Sections 1 and 2	Minor changes for clarification; no substantive changes	Rev. 1

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Preface

The Deep Space Network (DSN) was established by NASA and JPL to support the exploration of space, primarily by robotic spacecraft. JPL is responsible for the ongoing engineering development of the network and for its operations and maintenance (O&M). A contractor to JPL provides the O&M of the Goldstone Deep Space Communication Complex, the technical direction for O&M at other complexes, and other network support services.

This task description document (TDD) describes the management, GDSCC O&M, network engineering, and directed services that the Contractor must perform under the JPL DSN O&M Contract TBD. These services specifically include the following tasks:

- Planning
- GDSCC operations
- GDSCC maintenance
- Network operations control
- Problem analysis and resolution
- Network engineering support of JPL
- Product engineering
- Compatibility test support
- Mission-operations planning for flight project support
- Radar and radio-astronomy support
- Logistical support

This body of this TDD is organized to reflect the work breakdown structure (WBS) of DSN O&M tasking. Heading numbers and heading text in the main document correspond to hierarchical WBS numbers and elements. The four top-level WBS elements correspond to sections 1 through 5 of the document—the “body” of the document.

Each subsection in the body corresponds to a WBS element. Each subsection begins with a task description and goes on to describe contractor requirements. Special provisions are included in the requirements or called out following them. Content in higher-level sections flows down and applies to all subsections. For example, any requirements in Section 2.X apply to section 2.X.1, 2.X.2, 2.X.3, and so on.

Other information related to the task is appended. Appendix A is a list of acronyms, initializations, and abbreviations, as well as their expansions. Appendix B is a glossary of terms and their definitions. Appendix C is a list of references, including applicable documents cited in the requirements. All documents cited or referenced documents are included in this TDD by reference. Appendix D is a map of the GDSCC. Appendixes E, F, G, and H are process flowcharts, for reference. Appendix I is product engineering assignments, and Appendix J describes in detail

Contractor staff roles that are cited in the body as requirements or special provisions (also required).

This March 21, 2003 version of the TDD is the revision of the draft TDD of 14 February 2003. This revision incorporates information that became available after the February draft was published, such as proposal addenda or responses to requests for clarification. Change bars indicate the changes from the February draft.

After the current AOP is approved, the scope of this TDD may change because of changes in requirements for JPL-directed support or changes in the level of support required by TDD tasks. The changes will normally involve staffing and be of sufficient duration to be included in the next revision of the TDD.

1 MANAGEMENT

To meet the challenge of providing Deep Space Network (DSN) operations and maintenance (O&M) in a timely and cost-efficient manner, the Contractor must integrate the O&M activities into a cohesive program. The Contractor must manage the program so that it provides the Deep Space Mission System (DSMS) and the National Aeronautics and Space Administration (NASA) with insight into the Contractor's costs, schedule, and performance.

The Contractor Manager will be the Contractor's primary contact with the Jet Propulsion Laboratory (JPL) Contract Technical Manager (CTM), who resides in the Interplanetary Network Directorate (IND) of the DSMS Operations Program Office. The CTM will establish an interface with the Contractor Manager, to transmit the DSN technical guidelines, policies, and constraints under which the Contractor must operate. The CTM will also provide contract evaluation reports to the Contractor Manager, who will be expected to respond with immediate, decisive steps to correct any weaknesses identified. The Contractor Manager will be responsible and accountable for the Contractor's overall technical, cost, and schedule performance.

Except as otherwise specified in the contract, the Contractor will provide all the personnel and other resources necessary to manage and report on the contract. The execution of the tasks described in this document requires unique technical knowledge and experience, that is, some combination of—if not all of—the following personnel qualifications:

- College degree (at least BA/BS), in technical areas (science, engineering, or mathematics)
- Experience in the general area of spacecraft tracking network operations and maintenance
- Specialized skills applicable within the general area of spacecraft tracking network operations and maintenance

The Contractor will assess each candidate for a position against the task requirements for that position. An important measure of the Contractor's performance on this contract will be its ability to fill required positions with qualified staff members.

The following sections describe contract management subtasks.

1.1 CONTRACT MANAGEMENT

The Contractor will manage its JPL DSN O&M contract.

In support of this task, the Contractor shall:

1. Be responsible and accountable for the schedule, cost, and performance of all the tasks described in this document.
2. Maintain a management interface with the CTM.
3. Establish, document, and implement processes for providing direct and timely technical support to the DSCCs in Canberra, Australia, and Madrid, Spain.
4. Respond to contract performance evaluations, taking immediate and decisive steps to correct the weaknesses cited.
5. Respond to the CTM's requests for assigning Contractor resources to meet short-term demands, as required by unanticipated or accelerated task requirements levied on the DSN.
6. Establish, document, and implement Contractor processes to improve performance, reduce cost, and increase customer satisfaction.
7. Be responsible for the conduct and performance of Contractor personnel.
8. Provide required reports to NASA and JPL (through the CTM), as required in the JPL Prime Contract or upon request of the CTM.
9. Be responsible for obtaining and maintaining all permits required for the performance of the work in this contract.
10. Be responsible for all contract deliverables listed in the Contract Data Requirements List (CDRL).

1.1.1 FINANCIAL MANAGEMENT

The Contractor will manage the financial aspects of this contract. As part of this task, the Contractor will provide monthly actual costs, special accrual reports, and other financial data requested by the CTM. These data are critical to programmatic management by the DSMS Operations Program Office.

In support of this task, the Contractor shall:

1. Provide and maintain a financial management system for planning, tracking, accumulating, and reporting contract costs and for providing other financial support to meet the budgeting, cost reporting, billing, and disclosure requirements of the contract.
2. Prepare and submit an Annual Operating Plan (AOP), in response to DSMS-provided budget guidelines and as described in the CDRL (for document M018).
3. Monitor and control the costs associated with performing the tasks described in this TDD.

4. Provide actual expenditures and estimated expenditures incurred for contract work orders (CWOs) versus planned cost.
5. Provide reports of monthly actual costs, special accrual costs, and other financial data requested by the CTM.
6. Support the DSMS Operations Program Operating Plan (POP) by providing additional data as required by the DSMS Operations Program Office.
7. Support the DSMS Operations Program Office in special cost studies for the DSMS program office, NASA, or as requested by the CTM.

1.1.2 PROCUREMENT AND SUBCONTRACTS MANAGEMENT

The Contractor is responsible for any procurement—including subcontracts—it requires to support this contract.

In support of this task, the Contractor shall:

1. Establish a procurement capability. The Contractor procurement capability shall guarantee all materials and supplies are obtained in a cost-effective and timely manner, and that no DSN commitment is jeopardized by the late delivery of material and supplies.
2. Operate the DSN procurement capability in accordance with JPL, NASA, and Contractor procurement standards.
3. Provide for the purchasing and subcontracting of materials and services, including any equipment required to perform the tasks described in this TDD.
4. Provide access to procurement records to JPL, the California Institute of Technology, and U.S. Government auditors.

1.1.3 SAFETY AND HEALTH MANAGEMENT

Many Contractor activities will be conducted in an environment that could significantly affect employee health and safety. In particular, many of the activities at the Goldstone DSCC (GDSCC) will involve large, mechanical moving structures; electromagnetic radiation; and hazardous materials. The Contractor must establish and manage an effective safety-and-health program to protect personnel, equipment, antenna structures, and facilities.

The Contractor facilities in the Pasadena area and the GDSCC are considered multi-employer worksites; therefore, the Contractor is responsible for ensuring the safety and health of its employees, JPL employees, JPL subcontractor employees, and all other visitors to GDSCC and Contractor facilities.

In support of this task, the Contractor shall:

1. Implement a safety-and-health management plan that is intended to prevent damage to or destruction of material equipment and facilities; and to ensure a safe, healthy environment for all personnel using or visiting Contractor-operated facilities.
 - a. As part of the plan implementation, establish and manage a comprehensive safety program at GDSCC, including personnel safety training, accident prevention, investigation and reporting, emergency preparedness, fire prevention, and the procurement of safety supplies and fire suppression supplies.
 - b. Identify and define personnel health and safety measures, including the identification, evaluation, and abatement of potential workplace hazards; safe work practices and work procedures; communication system; enforcement and disciplinary systems; training and record keeping; and accident/incident investigation.
 - c. Define fire prevention and suppression measures, including confined-space entry; high-voltage electrical safety; lockouts, tagouts, and blockouts; electromagnetic radiation and radio-frequency hazards; rotating machinery hazards; hazardous and toxic substances; high fluid pressure hazards; and dangerous obstructions.
 - d. Emphasize injury and illness prevention and establish an effective first-aid and cardiopulmonary-resuscitation training program.
 - e. Document conformance to the California Code of Regulations (CCR), Title 8, *General Industrial Safety Orders (GISO)*, as applicable, and a site-specific safety plan.
 - f. Develop response and recovery actions for natural disasters such as earthquakes, fires, floods, and high winds.
2. Respond to NASA, JPL, federal, state, and local regulations and reporting requirements as specified in Appendix C, Applicable Documents.
3. Conform to the applicable NASA Procedures and Guidelines (NPGs), NASA Policy Documents (NPDs), and executive orders listed in Appendix C, Applicable Documents.

This task has a special provision:

1. The management plan shall be implemented and maintained by a Certified Safety Professional (CSP), as described in Appendix J, Contractor Staff Roles.

1.1.4 SYSTEM SAFETY MANAGEMENT

The Contractor will manage and report on system safety.

In support of this task, the Contractor shall:

1. Implement and document, according to the CDRL, the Systems Safety Plan (document M010). The plan shall assess testing, operations, system modification, implementation, and maintenance activities for hazards to personnel, critical hardware, and facilities.
2. Comply with the requirements of D-560, JPL Standard for Systems Safety, as applicable.
3. Implement a risk management process, in accordance with NASA/JPL policies and requirements for hazard reduction, for maximizing protection against personnel injury and/or property damage.
 - a. Describe how the Contractor's safety organization becomes aware of, and gains insight into, other organization's activities that occur within the Contractor's sphere of responsibility.
 - b. Utilize processes required for OSHA compliance that also show the Contractor's management structure and its interactions with the processes.
4. Prepare and submit periodic reports as described for M010, Systems Safety Plan, in the CDRL.

This task has a special provision:

1. The management plan shall be implemented and maintained by a CSP, as described in Appendix J, Contractor Staff Roles.

1.1.5 ENVIRONMENTAL MANAGEMENT

The facilities to be operated by the Contractor—especially the GDSCC—are subject to stringent local, state, and federal environmental regulations. For all of the locations at which this contract is performed—except within JPL—the Contractor will establish an environmental management program that complies with all applicable NASA, JPL, federal, state, and local environmental requirements.

In support of this task, the Contractor shall:

1. Establish, document, and implement an environmental management program in accordance with all applicable federal, state, and local regulatory requirements, and in accordance with other government policies including:
 - a. NPD 8500.1, NASA Environmental Management.
 - b. NPG 8820.3: Pollution Prevention, subject to state and local requirements for reporting hazardous material changes. Those requirements should meet or exceed the federal schedules in Chapter 6 of the NPG.

- c. NPG 8830.1, Affirmative Procurement of Environmentally Preferable Products.
- d. NPG 8580.1, Implementing the National Environmental Policy Act and Executive Order 12114.
- e. The Resource Conservation and Recovery Act (RCRA), the Clean Air Act, the Endangered Species Act, and the National Historic Preservation Act.
- f. Executive Orders as set forth in Appendix C, Applicable Documents.
 - i. Report all known usage and disposal of hazardous material to JPL Office 530 and the CTM, within 30 days of the discovery, disturbance, or removal of any hazardous material.
 - ii. Report any identified environmental-protection problems to JPL Office 530 and the CTM.

1.1.6 PHYSICAL SECURITY MANAGEMENT

Many of the contractor-operated facilities are considered minimum essential infrastructure for accomplishing NASA's mission. These include the GDSCC and the Remote Operations Support Area (ROSA). Other facilities are involved in ensuring the success of mission-critical events such as compatibility testing and the support-data generation.

To maintain the integrity of these contractor-operated facilities, the Contractor will provide a security program in accordance with the latest issuances of the National Industrial Security Program Operating Manual; NPG 1620.1, Security Procedures and Guidelines, Presidential Decision Directives, and other, NASA site-specific regulations.

In support of this task, the Contractor shall:

1. Protect/safeguard personnel, facilities, assets, and equipment; classified information and materials; and unclassified sensitive, technological data and information.
 - a. Implement and adhere to NASA and Department of Defense (DOD) regulations governing NASA Security and NASA Resource Protection.
 - b. Provide security engineering, maintenance, and operations for systems protecting classified information.
 - c. Develop and document a security plan that satisfies the requirements of the latest issuances of NPG 1620.1, Security Procedures and Guidelines; Presidential Decision Directives; and National Industrial Security Program Operating Manual, DOD 5220.22.

2. For the GDSCC, take into consideration Code X NRP waivers, the site's remote location, its location with respect to Ft. Irwin and other military reservations, and its large size.
 - a. Provide security guards at the GDSCC.
 - b. Provide site and building security that controls and records building access.
 - c. Provide passive security in conformance with the previously referenced documents.
 - d. Provide reporting and logging processes, procedures and mechanisms for security-related incidents, including unauthorized access, unauthorized removal, or damage to equipment, threats, and civil code violations.
 - e. Interact with JPL Security, to ensure continued compliance with current homeland and NASA Resource Protection (NRP) Program security requirements and status.
 - f. Interface with JPL security to maintain Force Condition (Force Con) levels consistent with the DOD (at GDSCC) and JPL (at ROSA and Contractor facilities).
 - g. Submit reports as required to the CTM, JPL security, and the JPL/NASA Management Office (NMO).
 - h. Submit to NASA/JPL audits of security plans and capabilities, as requested or scheduled.

1.1.7 INFORMATION TECHNOLOGY SECURITY MANAGEMENT

The information technology security (ITS) program levied on the Contractor is based on the JPL ITS program. The ITS program protects information that, although publicly releasable, requires high standards of integrity and availability in its use by NASA/JPL. It protects sensitive unclassified information, including Privacy Act information, proprietary data, International Traffic in Arms Regulations (ITAR) data, and technology embargoed from foreign dissemination for competitive reasons. The ITS program includes identifying vulnerabilities to the systems, assessing risk, establishing the configuration of the IT Systems, and identifying and assessing the risk posed by asset additions.

In support of this task, the Contractor shall:

1. Implement a proactive ITS program for flight operations that meets the minimum requirements of the DSMS program specified in JPL Document D-23140, DSMS Information Technology Security Policy, and JPL Document D-17896, DSMS Information Technology Security Requirements for Computer Systems.

- a. For each location that NASA/JPL furnishes for the Contractor information technology and telecommunications systems, implement at least JPL Document D-7155, JPL IT Security Requirements for Computer Systems, and JPL Document D-7223, JPL IT Security Requirements.
- b. Protect sensitive, unclassified information including Privacy Act information, proprietary data, ITAR data, U.S. Export Administration Regulations (EAR) data, NASA-defined mission data (MSN), and NASA-defined business and restricted technology (BRT) data.

1.2 FACILITIES MANAGEMENT

The Contractor will provide maintenance, operations, and sustaining engineering of facilities leased by the Contractor and used as operational facilities by JPL.

In support of this task, the Contractor shall:

1. Coordinate and manage the modifications to and maintenance of Contractor-leased facilities, including the communications and security systems.
 - a. For Government-provided real property, develop, implement, and maintain a real-property management plan.
 - b. For Government-provided real property at the GDSCC, provide “brick and mortar” services.
 - c. Coordinate with the CTM on any plans for new or upgraded facilities and their cost to the contract.

1.3 PROPERTY MANAGEMENT

To perform the task described in this TDD, the Contractor will be provided with Government-furnished property (GFP), which the Contractor must manage. GFP is located in Contractor-leased facilities, Contractor-operated facilities, and government facilities such as GDSCC. Because of the widespread locations, diversity, and use of the GFP, the Contractor must establish effective, ongoing processes for managing GFP. During annual inventories, the Contractor must also account for all GFP.

In support of this task, the Contractor shall:

1. Establish and maintain a property management plan, in accordance with M014 Real Property Management Plan and M015 Government Property Management Plan, as described in the CDRL.
 - a. Manage all property owned, leased, or acquired by NASA/JPL under the terms of this contract.
 - b. Manage and control administrative and technical GFP provided by JPL.

- c. Identify, control inventory of, keep records on, report on, and maintain a database of controllable property.
- d. Establish a process and procedures to control and account for all GFP across Contractor organizations regardless of their location.
- e. Store, control the inventory of, and account for all GFP, including:
 - i. Equipment sent to commercial vendors or to JPL for repair or calibration.
 - ii. Equipment temporarily or permanently transferred to DSN facilities.
- f. Catalog, control the serialization of, and trace the identity of all items introduced into the DSN.
- g. Control the numbering system used to identify buildings and structures (real property) at GDSCC.
- h. Inventory all GDSCC buildings and structures and submit forms for updating the NASA Real Property Database. Provide historical data for the duration of the contract, and report to the JPL Property Administrator all additions, modifications, and deletions to the buildings and structures, in accordance with NPG 8800.15, Real Estate Management Program Implementation Manual.
- i. Maintain the GDSCC Gold Book, which provides drawings and specification details of all updates to GDSCC facilities, sites, structures, and infrastructure.
- j. Maintain records and files of all GFP and transactions, for NASA, JPL, and Government audits.
- k. Report monthly to the CTM an inventory of all government-owned vehicles:
 - i. Fuel consumption
 - ii. Vehicle maintenance
 - iii. Commercial-vehicle identification and condition,
 - iv. For vehicles other than sedans, gross vehicle weight, and fuel type (gas, diesel, electrical, or alternate fuel)

1.4 ADMINISTRATIVE INFRASTRUCTURE SUPPORT

The Contractor will provide and account for all office furniture, computers, and computer network resources—whether GFP or Contractor-provided—it requires for the performance of the contract.

1.4.1 OFFICE SUPPORT

The Contractor will provide office supplies and equipment, including furniture, copiers, viewgraphs, video-conferencing equipment, telephones, and pagers.

In support of this task, the Contractor shall:

1. Provide all office support equipment and supplies directly related to the performance of the tasks described in this TDD.
 - a. Provide phones, faxes, video conferencing, and copiers, as needed for the performance of the contract.
 - b. Replenish all equipment and supplies in a manner that is cost effective to NASA and JPL.

1.4.2 COMPUTING INFRASTRUCTURE

The Contractor will support the computers and computer networks at Contractor facilities and communications interfaces to JPL. Administrative computers include the PCs and workstations that the Contractor uses to support network operations. Communications interfaces include local area networks (LANs) in contractor facilities and communications lines, including fiber-optic lines that run between contractor systems to JPL and to the Contractor-leased facilities. DSMS will provide the connectivity ("point of presence") at the JPL Oak Grove Facility.

In support of this task, the Contractor shall:

1. Provide PCs and computer workstations that the Contractor will use directly to support network operations.
2. Ensure that PCs and computer workstations are not more than three years out of date.
3. Provide the LANs for networking computers at contractor facilities.
 - a. Provide communication interfaces between JPL and the Contractor facilities used for this contract, and maintain the fiber-optic and other communication lines that constitute the physical component of these interfaces.
 - b. Provide computer support, including E-mail administration, database administration, system analysis and design, software and hardware configuration control, administrative software maintenance and development, system administration, and the computer training required for this contract.
 - c. Provide integrated services digital network (ISDN) lines as needed for the performance of the contract.

1.5 PROGRAM INTEGRATION

The Contractor will integrate program activities into a detailed strategic plan. This plan will integrate high-level mission milestones, DSN operations milestones, and DSMS engineering milestones with the Contractor's mission preparation activities, maintenance activities, resource requirements, and costs.

In support of this task, the Contractor shall:

1. Generate and maintain a detailed schedule that includes key mission activities, key critical events, completion dates for contractually required documents, DSN preparation plans, DSN preparation activities, implementation support, and reviews.
 - a. Generate and maintain a strategic plan covering at least two fiscal years, to define future personnel requirements and assignments, schedules and costs.
 - b. Assign multidisciplinary teams to develop and execute plans such as plans for mission-support preparation, anomaly resolution, and implementation activities.
 - c. Provide integrated plans to DSMS Operations Program Office.
 - d. Periodically provide status reports to DSMS Operations Program Office.
 - e. Include strategic plan results in the development of the AOP.

1.6 RISK MANAGEMENT

By its very nature, the DSN support of flight projects entails a high level of ongoing, day-to-day risk. Some obvious factors contributing to this risk are:

- Multiple, interactive, and exceedingly complex data systems and control systems
- Software-based systems requiring extensive operator knowledge and interaction
- Continuous implementation of system upgrades and new capabilities, all requiring extensive, ongoing operator training and hands-on experience
- Ever-increasing complexity of mission operations, which increase the complexity of the DSMS support operations, as typified by the operations for the Mars Exploration Rover mission
- The aging of antenna structures and other major equipment, increasing the probability of serious or even catastrophic structural or equipment failures
- Continuous budget reduction threats, which could reduce DSMS operations funding with no corresponding change in costs

The Contractor must plan to anticipate such risks and to identify strategies to mitigate them. The Contractor must also factor into the overall risk management

plan and process “lessons learned” from failures and other anomalous incidents. The Contractor should be able to mitigate most risks with existing Contractor resources.

In support of this task, the Contractor shall:

1. Develop the Risk Management Plan, as described for document M017 in the CDRL, in accordance with NPG 8000.4, Risk Management Procedures and Guidelines.
2. Analyze the “state of the DSN” at regular intervals, including identifying factors that could contribute to quantifiable or probable risks to DSMS operations.
 - a. Develop and maintain a prioritized list of anticipated risks:
 - i. Assess of the severity of the risk (that is, its potential effect on the flight project customer and the DSN), and the anticipated frequency or probability of the risk occurring.
 - ii. Determine the relative priority of the risk through a combination of these two parameters (severity and probability)
 - iii. Ensure the prioritized list documents the preceding information
 - b. Develop strategies to mitigate the anticipated risks.
 - c. Once each quarter, or as directed by the DSMS Operations Program Office, explore with the DSMS Operations Program Office the prioritized risks and proposed mitigation strategies.
 - d. Implement mitigation strategies that have the concurrence of the DSMS Operations Program Office. Should a concurred-with risk require contract action to provide adequate mitigation resources, consult with the CTM and Contracting Officer.
 - e. Document the outcome of actions taken—whether positive or negative—for future “lessons learned.”

1.7 TRAINING AND CERTIFICATION PROGRAM

At a minimum, the contractor will establish a program to train and certify the personnel performing the following functions:

- Link Controller
- Tracking Support Specialist
- Operations Chief
- Mission Support Engineer
- Test Engineer
- Maintenance Technician

In support of this task, the Contractor shall:

1. Establish and conduct training programs
2. At a minimum, certify personnel performing the following functions: Link Controller, Tracking Support Specialist, Operation Chief, Mission Support Engineer, Test Engineer, Maintenance
3. Maintain training records.
4. Identify any other positions that require certification.

1.8 CONTRACT PERFORMANCE METRICS

The Contractor will provide a performance measurement system that measures, in two specific areas, the level of performance in executing the tasks (that is, the contract statement of work [SOW]) in this TDD:

- Management, technical, and cost performance
- Response to the DSMS Operations Program Office areas of emphasis (AoEs)

These metrics will correlate to the contract SOW performance expectations, contract SOW standards of excellence, and the AoE issued by the CTM before to each performance-evaluation award-fee period.

In support of this task, the Contractor shall:

- Maintain and report technical performance metrics, in accordance with M021, Performance Metrics, as described in the CDRL.
- Maintain and report the status of the AoEs, in accordance with M021, Performance Metrics, as described in the CDRL.

2 GOLDSTONE DEEP SPACE COMMUNICATIONS COMPLEX OPERATIONS

The Goldstone Deep Space Communication Complex (GDSCC) is one of three tracking complexes that constitute the Deep Space Network (DSN). About 35 miles from Barstow, it is located entirely within the confines of the Fort Irwin military reservation (See Appendix D, GDSCC Map). The GDSCC encompasses 13,316 hectares, with elevations ranging from 950 to 1085 meters above sea level.

The GDSCC has five operational antenna sites: Apollo, Gemini, Mars, Uranus, and Venus. It also has two decommissioned antenna sites: Mojave and Pioneer. Except for the water storage tank located near the Pioneer site, these decommissioned sites are not part of this contract.

The Mars site includes the signal-processing center (SPC-10). The SPC-10 is the communications hub that processes signals to and from spacecraft, and monitors and controls antenna, telemetry, command, and radio-metric ground subsystems. Acquired spacecraft data are routed via a ground communication system to the Space Flight Operations Facility (SFOF) at JPL and subsequently to project operations control centers (POCCs) worldwide. The Contractor will operate and maintain the equipment at the SPC-10.

The SPC-10 is connected to the front-end areas at GDSCC by cable, local area network (LAN), and fiber-optic communications links. The front-end areas are deep space stations (DSSs) designated DSS-14, DSS-15, DSS-16, DSS-24, DSS-25, DSS-26, and DSS-27. DSS-16 can also function in a stand-alone mode utilizing its own data processing equipment. (DSS-12 and DSS-17 are decommitted from DSN operations; DSS-23 and DSS-28 are mothballed and in caretaker status.) Refer to Deep Space Mission System (DSMS) Document 810-005, *DSMS Telecommunications Link Design Handbook*, for the location of these various facilities at the GDSCC. The Contractor will operate and maintain the equipment at the front-end areas.

The Emergency Control Center (ECC) is at the Echo site, G-26. It houses DSOCC and flight-project data-processing equipment. The Contractor will maintain the ECC and activate it upon DSMS management request.

The front-end areas consist of hydraulically and electrically driven, two-axis rotational structures that are attached to large, parabolic-shaped reflectors, for concentrating and forming the RF beam. The structures also house the front-end microwave equipment consisting of microwave feeds, low-noise amplifiers, and RF processing equipment.

The GDSCC has seven antennas that are used in spacecraft-tracking operations, as shown in the following table of operational antennas at GDSCC:

Table 2-1: Operational Antennas at the GDSCC

Size	ID	Type
70-meter	DSS-14	AZ/EL
34-meter	DSS-15	high-efficiency (HEF)
34-meter	DSS-24	beam waveguide (BWG)
34-meter	DSS-25	BWG
34-meter	DSS-26	BWG
34-meter	DSS-27	high speed beam waveguide (HSB)
34-meter	DSS-13	BWG (only used for research and development [R&D] of DSN technologies and high-power-transmitter development and testing)
34-meter	GAVRT ¹	STD (Outreach only)
26-meter	DSS-16	X/Y

1. Goldstone-Apple Valley Radio Telescope

GDSCC has five antennas that are currently not used in tracking, R&D, or the outreach program:

- The 9-meter antenna at the Apollo site, designated DSS-17. This antenna is decommissioned.
- The 11-meter space very-long-baseline-interferometry (SVLBI) antenna at the Apollo site, designated DSS-23. This antenna is decommissioned and in caretaker status, awaiting its final disposition.
- The antenna at the Mojave site (decommissioned). Although the antenna and facilities are not included in this contract, Mojave site security is included.
- The antenna and facilities at the Pioneer site, designated DSS-11. Except for the water tank, this site is decommissioned and is not included in the contract.
- The 34-meter HSB antenna at the Gemini site, designated DSS-28. This antenna was never operational and is in caretaker status.

The GDSCC buildings under this contract include 75 that are occupied by Contractor personnel and 39 that are used for storage or are empty. These buildings have an area of 16,516 m².

The GDSCC is accessed by one of two roads: NASA Road and Goldstone Road. From these roads, access roads lead to the sites (from NASA Road to Gemini and Venus; from Goldstone Road to Echo, Apollo, Pioneer, Uranus, and Mars). The Contractor will be responsible for maintaining 27 miles of roadway.

Southern California Edison (SCE) provides the 33-kilovolt commercial power feed to the GDSCC. The GDSCC has two power plants: one at Echo (with 3,000-kilowatt diesel-generator capacity) and one at Mars (with 6,000-kilowatt diesel-generator capacity). The Contractor will be responsible for maintaining and operating the GDSCC power plants and associated power grids.

Fort Irwin provides water to the GDSCC pump house—the only GDSCC building outside of GDSCC boundaries that the Contractor will maintain. The water supply system feeds:

- The 1,325,000-liter water-storage tank at Venus
- The 670,000-liter water-storage tanks at Apollo, Echo, Mars, and Venus
- The 670,000-liter emergency water-storage tank at Pioneer
- The 682,000-liter fire-protection-only water-storage tank at Mars

The Contractor will also be responsible for a Class-III landfill at the Echo site and four oxidation ponds: two at Echo and two at Uranus.

2.1 DEEP SPACE COMMUNICATIONS COMPLEX MANAGEMENT

This task addresses the overall management of operations and maintenance at the GDSCC. The Contractor will be responsible for the performance of all of the tasks described in this document.

The Contractor will provide at least the following:

- Radio frequency coordination
- Site security
- Safety and health compliance
- Environmental compliance
- Energy and water management
- Intracomplex communications
- Support services
- Outreach
- Fort Irwin interface
- Airspace coordination
- Real-time operations
- Antenna/mechanical maintenance
- Technical systems maintenance
- Facilities and infrastructure maintenance
- Advanced systems operations and maintenance
- Technical services
- Planning and management reporting
- Performance measurement
- Subcontract management
- Procurement
- Property management
- Information management
- Configuration management
- Workmanship assurance
- Personnel management
- Other functions deemed necessary by the Contractor to manage this contract

The Contractor must integrate the organization at the GDSCC to ensure the scheduling, performance, reporting, and completion of all required tasks.

In support of this task, the Contractor shall:

1. Account for the operation of the GDSCC, including schedule, cost, and performance of all the tasks described in this document.
2. Establish, document, and implement processes for establishing a close working relationship with CDSCC and MDSCC, sharing lessons learned.
3. Integrate all GDSCC functions and activities, to ensure the timely completion of all tasks.
4. Work closely with and respond to the DSMS Operations Program Office and Contract Technical Manager (CTM) for assignment of Contractor resources and/or DSN assets to meet the short-term demands of any additional or accelerated task requirements levied on the DSN.
5. Establish, document, and implement Contractor processes to improve performance, reduce cost, and increase customer satisfaction.
6. Be responsible for the conduct and performance of Contractor personnel.
7. Perform and/or manage the following:
 - a. Radio frequency coordination
 - b. Site security
 - c. Safety and health compliance
 - d. Environmental compliance
 - e. Energy and water management
 - f. Intracomplex communications
 - g. Support services
 - h. Outreach
 - i. Fort Irwin interface
 - j. Airspace coordination
 - k. Real-time operations
 - l. Antenna/mechanical maintenance
 - m. Technical systems maintenance

- n. Facilities and infrastructure maintenance
- o. Advanced systems operations and maintenance
- p. Technical services
- q. Planning and management reporting
- r. Performance measurement
- s. Subcontract management
- t. Procurement
- u. Property management
- v. Information management
- w. Configuration management
- x. Workmanship assurance
- y. Personnel management
- z. Other functions the Contractor deems necessary to manage this contract

2.1.1 RADIO FREQUENCY COORDINATION

Because of their extreme sensitivity, GDSCC antennas are susceptible to radio frequency interference (RFI). The likelihood of such interference is increased by nearby electronic activities supporting warfare test and training.

Because of the criticality and intensity of both National Aeronautics and Space Administration (NASA) and military operations, spectrum use in the Mojave Desert is actively coordinated among all affected parties. To address the unique demands of this coordination effort, the Department of Defense (DOD) and NASA have formed the Mojave Coordination Group (MCG). The group is cochaired by the DOD and the Jet Propulsion Laboratory (JPL), with membership from all the military bases and weapons labs in the area, the GDSCC, and the Federal Aviation Administration (FAA). Via the Mojave Coordination Agreement, procedures are established so that, when properly coordinated, military and GDSCC activities will not interfere with one another.

In support of this task, the Contractor shall:

1. Comply with the Memorandum of Understanding (MOU) between the DOD and NASA for Compatible Operations in the Mojave Desert Area ("Mojave Coordination Agreement").

2. Actively participate in frequency and RFI coordination, RFI prediction and analysis, and spectrum surveillance.
3. Perform routine radio frequency coordination:
 - a. Identify DSN Class-1 and Class-2 events in coordination with JPL Telecommunications and Mission Support (TMS) Managers and Contractor Mission Support Engineers, and notify NASA and DOD offices of RFI issues.
 - b. Provide a weekly GDSCC schedule to the Western Area Frequency Coordinator at Pt. Mugu.
 - c. Provide periodic briefings to DOD personnel about GDSCC activities, capabilities, and susceptibility to RFI.
 - d. Represent GDSCC operations at regular and ad hoc MCG meetings.
4. Perform special-case interference coordination:
 - a. Represent the GDSCC at special planning and evaluation meetings at JPL, Edwards, the FAA, or elsewhere, as requested by the JPL Spectrum Manager or Contractor Mission Services Engineer.
 - b. Provide GDSCC schedules and related data as requested by agencies responsible for planning potential-interference scenarios.
 - c. Perform RFI analysis, monitor events for occurrence of RFI, and provide analytical reports of results.
5. Perform DSN RFI prediction and analysis in support of routine and critical mission event planning:
 - a. Perform RFI studies for Mission Event Readiness Reviews (MERRs), before critical spacecraft events.
 - b. Perform RFI studies, before anticipated RFI events:
 - i. A deep-space mission interfering with another deep-space mission
 - ii. An Earth orbiter interfering with a deep-space or high-Earth-orbit (HEO) mission.
 - iii. A launch vehicle interfering with a deep-space or HEO mission.
6. Provide RFI prediction for special events to Contractor mission services engineers and to SPC-10 personnel.
7. Investigate, coordinate, analyze, and report RFI occurrences:
 - a. Identify GDSCC–external RFI, and notify the source to terminate transmission.

- b. Identify GDSCC–internal RFI, notify the on-duty operations supervisor, and resolve the problem.
 - c. Investigate any RFI that cannot be immediately identified.
 - d. Conduct spectral measurements of potential RFI sources.
 - e. Record RFI event closeouts for all RFIs, including lessons learned for the RFIs in the DSN band.
 - f. Compile, analyze, and publish an RFI summary report every 12 months. Due at the end of January, this report includes event occurrences and three-year-trend analysis with statistics and explanations.
8. Perform spectrum surveillance:
- a. Monitor spectrum activities around the GDSCC in the DSN and shared bands
 - b. Investigate events detected by the Radio Frequency Surveillance System (RFS) in the DSN band.
 - c. Identify sources of threatening events and coordinate to resolve them.
 - d. Maintain a trend-record database of detected events.
 - e. Maintain the RFS equipment, including the antenna station and remote monitoring terminal.
 - f. Advise the JPL Spectrum Manager about needed upgrades to the RFS.
9. Provide NASA–JPL frequency management support:
- a. Represent the GDSCC at JPL–GDSCC spectrum management meetings.
 - b. Ensure that all radiation from all GDSCC transmitters are in accordance with National Telecommunications and Information Administration (NTIA) authorizations provided by the JPL Spectrum Manager.
 - c. Maintain and update the frequency assignment database for the GDSCC.

This task has the following special provision:

- 1. The RFI Coordination Manager shall have a “secret” clearance and in-depth knowledge of radio frequency theory, as described in Appendix J, Contractor Staff Roles.

2.1.2 GDSCC SITE SECURITY

The GDSCC is part of the minimum essential infrastructure that NASA considers necessary for accomplishing its mission. Because of its remote location, the value

of the infrastructure and equipment, the number of resident and nonresident contractor and JPL employees, and the frequent tourist visitors to the site, the Contractor will establish and maintain a comprehensive security system. The system will include passive security (access control, fencing, etc.) and active security (guards, patrols) to ensure access control, equipment security, property security, and rapid response to reported and suspected security incidents.

Key interfaces have been established to ensure cooperation, coordination, and information exchange with NASA–JPL Security and with public security providers at the local, state, and federal levels. Such providers include the San Bernardino County Sheriff, the California Highway Patrol, the Fort Irwin Provost Marshal, and the Federal Bureau of Investigation (FBI).

In support of this task, the Contractor shall:

1. Provide security for the GDSCC.
2. Establish a security system that conforms to NASA, JPL, and homeland security requirements.
3. Develop and document a security plan that satisfies the following:
 - a. NASA Procedures and Guidelines (NPG) 1620.1, *Security Procedures and Guidelines*, especially Chapter 8, “NASA Minimum Essential Infrastructure Protection Program,” subject to approved NASA Code X waivers
 - b. NPD 1600.2, *NASA Security Policy*
 - c. Applicable Presidential Decision Directives
 - d. National Industrial Security Program Operating Manual, DoD 5220.22
4. In its security plan, consider the remoteness of the GDSCC, including its location with respect to Fort Irwin and other military reservations, the size of the facility, and agreed-to NASA Resource Protection (NRP) waivers.
5. Control access to the GDSCC, including
 - a. Authorize and log visitor access.
 - b. Coordinate all foreign national visit requests with JPL.
 - c. Escort visiting foreign nationals without National Agency Check (NAC).
6. Interface with the Fort Irwin Provost Marshal’s Office to arrange transit for visitors and foreign nationals.
7. Provide security guard services.
8. Provide site and building security that controls and records building access.

9. Provide site passive security in conformance with the previously referenced documents.
10. Provide reporting and logging processes, procedures, and mechanisms for security-related incidents, including unauthorized access, unauthorized removal of or damage to equipment, threats, and civil code violations.
11. Interface with JPL Security to ensure continued compliance with current homeland security and NRP security requirements and status.
12. Interface with JPL Security and the Fort Irwin Provost Marshal's Office to keep force condition levels consistent with DOD's and NASA's.
13. Submit security incident reports to JPL Security and the CTM, as described in M012, Security Management Plan, in the CDRL.
14. Submit to NASA/JPL audits or assessments of security plans and capabilities, as requested and/or scheduled.

2.1.3 SAFETY AND HEALTH COMPLIANCE

Many of the activities at the GDSCC involve large, mechanical, moving structures; electromagnetic radiation; and hazardous materials. The size and remoteness of the GDSCC require extended travel with its inherent increase in risk. The remoteness of GDSCC and its minimal emergency medical capabilities may also contribute to health and safety risks. Because of these risks, the Contractor must establish and manage a safety-and-health program to protect personnel and equipment. The Contractor must also actively ensure employee compliance with the program and provide regular status and incident reports.

Because various contractors and JPL employees, as well as Contractor employees, require access to the GDSCC, it is considered a multi-employer worksite. Therefore, the Contractor is responsible for ensuring the safety and health not only of its own employees, but also of its subcontractor employees, JPL employees, JPL's contractor employees, and all other visitors to the GDSCC and Contractor facilities[c1].[ajs2]

The Contractor will also take measures to prevent damage to or destruction of all material, equipment, and facilities at the GDSCC.

In support of this task, the Contractor shall:

1. Develop and comply with an approved Safety, Health, and Environmental Plan (M009), as described in the CDRL. The plan shall encompass:
 - a. Personnel training
 - b. Accident prevention, investigation, and reporting
 - c. Emergency preparedness

- d. Fire prevention and suppression
 - e. Procurement of safety and fire suppression supplies
 - f. Confined-space entry
 - g. High-voltage electrical safety
 - h. Lockouts, tagouts, and blockouts
 - i. Electromagnetic radiation and radio-frequency hazards
 - j. Rotating machinery hazards
 - k. Hazardous and toxic substances
 - l. High-fluid-pressure hazards
 - m. Pressure vessels and systems
 - n. Dangerous obstructions
 - o. Evacuation of injured personnel from antennas and other high structures
2. As part of the safety and health plan, develop, document, and implement specific safety plans for each work site[c3].
- a. The plan shall address:
 - i. Personnel responsibilities for safety and health
 - ii. Identification, evaluation, and abatement of workplace hazards
 - iii. Safe work practices and procedures
 - iv. Plan communication, enforcement, training, and record-keeping processes
 - v. Accident/incident investigation procedures
 - b. The plan shall strongly emphasize injury and illness prevention
 - c. The plan shall establish an effective first-aid and cardiopulmonary-resuscitation (CPR) training program.
 - d. The plan shall specify responses to natural disasters such as earthquakes, fires, floods, and high winds.
3. As part of the safety and health plan, develop, document, and implement an Injury and Illness Prevention Program that complies with the California Code of Regulations (CCR), Title 8, *General Industrial Safety Orders*, as applicable.

4. Comply with JPL D-560, *JPL Standard for Systems Safety*, as applicable.
5. Develop, document, approve, and enforce engineering-change safety plans for Contractor-performed work.
6. Approve and enforce safety plans for work performed by subcontractors, JPL, and JPL subcontractors.
7. Provide the plan to the cognizant JPL Office 530 managers and to the CTM, for approval.
8. Develop and implement procedures [c4]and provide trained personnel to establish and maintain an emergency response team that shall prevent, control, or minimize damage and injury from hazardous conditions and mishaps.
9. Comply with all JPL and NASA planning and reporting requirements for injuries, facility damage, property/equipment damage and close calls.
10. Ensure that the plan is implemented and maintained by a Certified Safety Professional (CSP).
11. Develop and implement fire protection procedures, emphasizing the use of fire suppression or containment equipment, procedures, and personnel training to prevent fire or contain and minimize fire damage.
12. Maintain an interface with Fort Irwin medical and fire-fighting authorities to ensure continued emergency medical evacuation and fire-fighting support.
13. Ensure that National Fire Protection Association (NFPA) and NASA requirements for fire protection are followed.
14. Communicate its safety and health plans and requirements to its employees.

This task has a special provision:

1. A CSP shall implement and maintain the safety and health plan. The CSP shall:
 - a. Maintain all Cal/OSHA–required record keeping and documentation.
 - b. Ensure issuance and maintain safety oversight of the required qualifications and certifications for all operators of heavy equipment.
 - c. Maintain Cal/OSHA certifications, requirements, and testing records, along with documentation for all antenna hoists and cranes, pressure vessels and systems, electrical systems, radio-frequency equipment, lasers, and any other equipment per Cal/OSHA requirements.
 - d. Report injuries, illness, facility damage, property/equipment damage, and close calls to JPL and NASA following the policy and procedure in

NASA Policy Document (NPD) 8621.1, *NASA Mishap and Close-Call Reporting, Investigation, and Recordkeeping*.

2.1.4 ENVIRONMENTAL COMPLIANCE

The GDSCC is in a sensitive environment in the Mojave Desert. In the course of operating and maintaining the hardware in the facilities, personnel regularly use and handle hazardous materials. These activities are subject to stringent local, state, and federal environmental regulations. The Contractor will comply with all environmental regulations and regularly report on the status of its compliance with them.

In support of this task, the Contractor shall:

1. Establish an environmental-management plan for ensuring compliance with environmental regulations during all aspects of the Contractor's work at the GDSCC.
2. Comply with all applicable federal, state, and local regulatory requirements, and with other government policies:
 - a. NPD 8500.1 *NASA Environmental Management*
 - b. NPG 8820.3 *Pollution Prevention*, subject to state and local requirements for reporting hazardous material changes. Those requirements should meet or exceed the federal schedules found in Chapter 6 of the NPG.
 - c. NPG 8830.1 *Affirmative Procurement of Environmentally Preferable Products*.
 - d. NPG 8580.1, *Implementing The National Environmental Policy Act And Executive Order 12114*
 - e. The Resource Conservation and Recovery Act (RCRA), the Clean Air Act, the Endangered Species Act, and the National Historic Preservation Act.
 - f. Executive Orders. Executive Orders applicable to work performed under this Contract are set forth in Appendix C, Applicable Documents.
3. For contractor tasks that may adversely affect the environment, comply with the NPG 8580.1:
 - a. Submit JPL Form 39 to the cognizant JPL Office 530 manager and to the CTM, for approval.
 - b. Implement the task according to the approved plan.
4. In coordination with the JPL Environmental Affairs Office and Office 930, interact with state, federal, and local environmental-regulatory agencies.

5. When seeking equipment permits from the Mohave Desert Air Quality Management District, coordinate with the JPL Environmental Affairs Office and Office 930.
6. Establish procedures for the handling and reporting of hazardous materials and waste, including personnel training and certification.
 - a. Do no work on known asbestos-containing materials, asbestos-contaminated materials, materials that might release polychlorinated biphenyls (PCBs), chlorofluorocarbons (CFCs), ozone depleting substances (ODSs), radioactive materials, radioactive sources, or oil containing PCBs or lead, without prior approval of the JPL Environmental Affairs Office.
 - b. Notify the JPL Environmental Affairs Office and the CTM of known use and disposal of hazardous material, including asbestos contamination, PCB equipment, lead-based paint, CFC chillers, ODSs, and radioactive sources.
 - c. Generate and update records of hazardous material notifications for discovery, disturbance, or removal of hazardous material.
 - d. Dispose of hazardous material in a manner approved by the JPL Environmental Affairs Office.
 - e. Provide monthly reports to the JPL Environmental Affairs Office and to the CTM, of the disposal of the waste, including type, date, quantity, location, doing organization, and responsible agency.
 - f. Certify employees directly involved in hazardous material handling, storage, and shipping in accordance with federal, state, and local laws and regulations.
7. Establish policies for reducing the emission and use of ODSs:
 - a. In the storage and use of ODSs, comply with Executive Order 12843, *Procurement Requirements and Policies for Federal Agencies of Ozone-Depleting Substances*.
 - b. Provide monthly reports to the JPL Environmental Affairs Office and the CTM of the status of the inventory of ODSs.
8. Wear or use personnel protective equipment (PPE) appropriate to the task being performed.
9. Establish procedures for keeping Material Safety Data Sheets (MSDSs) current for all materials used.

10. Adhere to recycling program policies and procedures, as required by the Fort Irwin MOU.
11. Use trained personnel to clean up any hazardous material spills at the GDSCC. Immediately report these incidents to the CTM and to the JPL Environmental Affairs Office.

This task has a special provision:

1. The work shall be managed by a Registered Environmental Assessor (REA)

2.1.5 ENERGY AND WATER MANAGEMENT

The Contractor will provide energy and water management.

In support of this task, the Contractor shall:

1. Establish and enforce programs to acquire, conserve, and report energy usage of government-owned facilities (GOF) at the GDSCC.
 - a. Comply with the energy efficiency and water conservation goals and requirements of the National Energy and Water Conservation Policy Act, 42 USC 8251-8287, as amended by the Energy Policy Act of 1992, P.L. 102-486; and of Executive Order 13123, Greening the Government Through Efficient Energy Management.
 - b. Set annual goals to reduce building energy usage per gross square foot from the FY 1985 baseline. The annual goals shall be indexed to the federal goals to achieve a 30 percent reduction by the end of fiscal year (FY) 2005 and a 35 percent reduction by the end of FY 2010.
 - c. Set annual goals to reduce the utilized gross square footage of energy-intensive facilities. The annual goals shall be indexed to the federal goals, to achieve a 20 percent reduction by the end of FY 2010.
2. Procure all required energy to operate and maintain the GDSCC. This includes:
 - a. All electrical power from an outside vendor
 - b. The petroleum, oil, and lubricants (POL) necessary to operate and maintain local energy-generation facilities
3. Maintain monthly records of energy costs and usage for the current year and previous three years.
4. Conduct comprehensive energy conservation audits of approximately 10 percent of facility gross square footage each year.
 - a. Propose cost-effective energy conservation measures to the DSMS Operations Program Office.

5. Provide to the DSMS Operations Program Office:
 - a. Quarterly energy and water consumption reports
 - b. Annual Office of Management and Budget Circular A-11, Energy and Transportation Efficiency Management, budget exhibits
 - c. Annual assessment report of energy management progress
6. Minimize the life cycle cost of new and renovated facilities by utilizing sustainable design and construction methods, where cost effective:
 - a. Comply with either the current Federal Energy Building Code 10 CFR 434 or the State of California Title 24 Energy Efficiency Code, as directed by JPL, for all facility design and construction work performed by the Contractor.
7. Prepare all annual and special energy and environmental reports as required by the NASA Energy and Environmental Management Division (Code JE).

2.1.6 INTRACOMPLEX COMMUNICATIONS

Local (intracomplex) communications at the GDSCC consist of multiple systems, including:

- An extensive (conventional) telephone system (400 sets)
- Portable radio transceivers (including a base station and antennas)
- An administrative LAN

These communication systems support administrative functions, operational-activity coordination, antenna maintenance, and other maintenance. The telephones and radios are also required for the safety of personnel.

In support of this task, the Contractor shall:

1. Maintain the communications equipment, supporting infrastructure, and associated test equipment.
2. Perform logistics and maintenance support for all installed components, as required to maintain or exceed an overall availability of 99.9%.
3. Operate, administer, and maintain administrative LAN equipment (hubs, switches, and routers), associated system software, and operational configurations.
4. Maintain records of hardware and other system failures, and recommend replacement or upgrades, as required.

2.1.7 INFORMATION MANAGEMENT

Information management at GDSCC consists of managing the following information equipment or systems:

- Administrative firewall, to protect the administration and science networks from intrusions
- Intrusion detection equipment
- Email servers for administrative, mission support, and DSN-wide operational messaging

In support of this task, the Contractor shall:

1. Administer information systems
2. Perform logistics and maintenance for all installed components.

2.1.8 SUPPORT SERVICES

Support services consist of sanitation/custodial services, landscaping services, food services, transportation, and heavy equipment.

2.1.8.1 Sanitation/Custodial Services

The Contractor will provide sanitation services for a clean working environment for personnel and a clean operating environment for equipment. Pursuant to an MOU between the DOD and NASA, the GDSCC disposes of trash at Fort Irwin.

In support of this task, the Contractor shall:

1. Maintain indoor and outdoor environments at the GDSCC that protect personnel and equipment.
2. Provide a working environment that promotes personnel safety, health, morale, and productivity.
3. Comply with all federal, state, and local laws and regulations governing sewage and solid waste disposal.
4. Provide for trash removal and disposal:
 - a. Every day, collect trash and recyclables, place them in the provided containers, and transport them to Fort Irwin.
 - b. Recycle according to the MOU.
5. Provide sewage system maintenance.

2.1.8.2 Landscaping Services

In support of the Landscaping Services task, the Contractor shall:

1. Ensure that the outside areas present a neat, clean, and pleasing appearance.

2.1.8.3 Food Services

At the GDSCC Echo site is a cafeteria with commercial-sized cooking surfaces and ovens, a commercial-sized dishwasher, cooking utensils, pots and pans, serving trays, serving plates, glasses, and silverware. The Contractor will provide food services at the Echo Site and make provisions for providing food services at all remote sites.

In support of this task, the Contractor shall:

1. Provide food service for personnel and visitors at the GDSCC.
2. Operate the food service in accordance with all federal, state, and county regulations governing food service and associated sanitation.
3. Provide food service at the remote work locations by delivering food from a central location to the remote locations and/or by providing vending machine service at the remote locations.

2.1.8.4 Transportation

Because of the distance between the various work sites within GDSCC, the Contractor will provide ground transportation for personnel and materiel. The Contractor will also operate an emergency response vehicle.

The Army will provide ambulance service to Weed Army Hospital at Fort Irwin. In life-threatening circumstances, the Army will provide air ambulance services from GDSCC to Weed Army Hospital or to a civilian medical facility, based on the orders of the Medical Officer-in-Charge (OIC).

In support of this task, the Contractor shall:

1. For material and all Contractor personnel, provide transportation between the various GDSCC work sites.
2. For JPL personnel, provide vehicles for transportation between the various GDSCC work sites.
3. For all personnel, provide transportation between Echo and the GDSCC airport.
4. Ensure that all vehicle operators on the GDSCC—including operators of GSA vehicles—comply with all traffic laws, rules, and regulations, especially those imposed by the Army at Fort Irwin.
5. Operate an emergency response vehicle (owned by the GSA) at the GDSCC. The General Services Administration (GSA) provides all maintenance services for GSA vehicles.

2.1.8.5 Heavy Equipment

JPL will furnish some GFE heavy equipment to the Contractor. Because of the nature of the work at the GDSCC (elevated work locations on antennas, roadwork, heavy lifting, etc.), this equipment may not suffice for all work performed on site. In such cases, the Contractor will provide the necessary heavy equipment.

The Contractor shall:

1. Determine heavy equipment requirements and, when necessary, secure the required heavy equipment for as long as required.
2. For the life of the contract, provide a heavy-lift capability to height of at least 150 feet.

2.1.9 OUTREACH PROGRAM ACTIVITIES AND PRODUCTS

Outreach activities will be included in the contract. One effective Contractor outreach activity at the GDSCC is the public tour. Another is acquainting visitors in the scientific and technical community with DSN activities.

In support of this task, the Contractor shall:

1. Coordinate and schedule GDSCC visitor tours.
2. Conduct visitor tours, including presentations and site visits.
3. Conduct open houses, in coordination with JPL.
4. Help develop and maintain outreach exhibits at the GDSCC.
5. Represent the GDSCC to the local community.
6. Ensure that all publicly released information is approved by the JPL Public Affairs Office.
7. Provide a monthly narrative report of outreach activities to the JPL Interplanetary Network Directorate (IND) Outreach Coordinator.
8. Enter into the NASA outreach-tracking database, the Education Program Data Collection and Evaluation System (EDCATS), the number of visitors, venues of off-site events, participants present at off-site events, and other relevant details.

2.1.10 DOD INTERFACE

MOUs among NASA, JPL, and the DOD govern the interagency cooperation for:

- Road repair
- RFI protection
- Military Police (MP) assistance

- Fire fighting
- Ambulance services
- Emergency medical services
- Water
- Solid-waste disposal
- Recycling

Fort Irwin provides the central water supply to the GDSCC by allowing the GDSCC water pump house, outside the GDSCC boundary on Fort Irwin proper, to pump water from Fort Irwin's water storage tanks. JPL pays for the electricity used at the GDSCC pump house and for the water purchased from the Army to supply the GDSCC.

The Naval Weapons Training Center (NWTC) China Lake and Edwards Air Force Base (AFB) have installed equipment to support the Goldstone National Training Center (NTC) Inter-Range Microwave System (GNIMS) at the G-100 location, near Apollo. Although no specific support activities are required of the Contractor, the Contractor will need to periodically provide NWTC and Edwards AFB personnel with access to the site.

The NWTC is laying fiber-optic lines from the western boundary of the GDSCC through the Echo site, to the NTC. These lines will become the primary communications link between the NTC and the NWTC; GNIMS will become the backup link.

The Department of the Army is expanding the Fort Irwin NWTC land area to the west and south of the GDSCC. The Contractor will be involved in assessing the environmental impact statement (EIS).

In support of this task, the Contractor shall:

1. Establish a working interface with the various Fort Irwin offices and meet with them at least quarterly.
2. Report to the CTM any issues arising between the Army and the GDSCC that could adversely affect GDSCC operations or that could jeopardize the relationship between the Army and NASA or JPL.
3. Help NASA and JPL offices interface with Fort Irwin, at the request of the CTM.
4. Participate in meetings that review MOUs and cooperation among NASA, JPL, and various defense agencies.
5. Provide technical assistance to Army, Navy, or Air Force personnel operating within the GDSCC boundaries. Coordinate discrepancies or issues with the CTM.

2.1.11 AIRSPACE COORDINATION

The antennas at Goldstone are capable of radiating high-power microwave signals ranging from 4 kW to 500 kW. High-power radiation can be hazardous to military and civilian aircraft operating in nearby airspace. Because this airspace is heavily used by military and commercial flights, its use is coordinated via the MCG, described in Section 2.1.1. The Contractor must coordinate with the MCG any high-power-radiation activities at the GDSCC, especially the use of the Goldstone Solar System Radar (GSSR).

In support of this task, the Contractor shall:

1. Coordinate over-flights of the GDSCC, per DOD requests.
2. Investigate unauthorized over-flights and notify DOD flight operations of them.
3. Prepare maps, pointing angles, time-period, and other specifics for each GSSR track, as necessary to obtain approval for high-power radiation.
4. Issue high-power radiation authorization to the SPC-10.
5. Coordinate high-power radiation for spacecraft emergencies.
6. Represent the GDSCC at monthly R2508 Complex Control Board meetings convened by the FAA and present forecasts of high-power transmitter usage to the Central Coordinating Facility (CCF).
7. Investigate unauthorized high-power radiation and report it to the CCF and the JPL Spectrum Manager (with time period, pointing angles, power, frequency, and bandwidth).
8. Train GDSCC real-time operations personnel on high-power transmitter operation that could compromise safety or lead to the violation of frequency and airspace authorizations.
9. Coordinate GDSCC airport use.

2.2 REAL-TIME OPERATIONS

The Contractor supports the DSN by providing 24-hour-a-day, seven-day-a-week real-time operations and system administration at the GDSCC. The primary functions of GDSCC real-time operations are to:

- Acquire telemetry from spacecraft
- Transmit commands to spacecraft
- Generate radio-metric data consisting of angle, range, Doppler, and very-long-baseline interferometry (VLBI) data
- Generate radio-science data
- Operate the GSSR

- Provide real-time monitoring of data
- Be the focal point for all on-site activities
- Administer local systems

Real-time operations are conducted in the SPC-10, as described in the introduction to Section 2. These operations may require real-time maintenance, as described in sections 2.3 and 2.4.

GDSCC real-time operators (“Link Controllers”) remotely monitor and control DSS subsystem elements. These elements acquire and process telemetry data, transmit commands, generate radio-metric and radio-science data, and monitor the performance of the DSS. The Link Controllers monitor the performance of each spacecraft-dependent data-processing link. They also coordinate all spacecraft-specific activities with flight-project control teams, with Tracking Support Specialists (TSSs), and with the Operations Chief at the Network Operations Control Center (NOCC).

The Link Controllers maintain real-time-operations activity logs, write discrepancy reports, and maintain station logs. They also support DSN data-systems development personnel during the testing of new capabilities, and they participate in the testing of new or modified capabilities.

Real-time operations personnel also monitor smoke alarms, fire alarms, emergency response communications, GDSCC security-guard communications, and communications with the NASA airplane. They are also the focal point for alerting emergency response teams and Fort Irwin emergency response units.

In support of this task, the Contractor shall:

1. Perform real-time operations in accordance with DSN standard operating procedures (SOPs), and with DSN-provided and Contractor-provided operations documents.
2. Operate GSSR and radio-astronomy equipment.
3. Support the testing of new or modified capabilities.
4. Reallocate GDSCC resources in real time, in response to scheduling changes or spacecraft emergencies.
5. Perform system administration, including real-time administration.
6. Alert Fort Irwin and GDSCC emergency-response teams, and coordinate their response.
7. Perform Level-1 maintenance.
8. Monitor activities for RFI.

9. Activate the Emergency Control Center (ECC)
10. Attend operations working groups and technical interchange meetings at the GDSCC, Pasadena, and the overseas complexes.

This task has a special provision:

- 1 Real-time operations staff shall be certified in real-time operations, as described in Section 1.7.

2.3 ANTENNA/MECHANICAL MAINTENANCE

Along with the antennas of the Canberra Deep Space Communication Complex (CDSCC) and the Madrid Deep Space Communication Complex (MDSCC), the antennas at the GDSCC are the most valuable assets in the DSN: without them, the DSN would not exist. Their availability, which must meet the high standards of DSN users and customers, is contingent upon how well the antennas and related mechanical components are maintained. When unusual findings are reported during antenna maintenance, engineers and technicians can determine maintenance needs, choose approaches to maintenance, or design engineering changes that extend the life of antennas, increase their performance, or meet as-built specifications.

The Contractor will be responsible for the maintenance and repair of the GDSCC antennas below:

- GAVRT (formerly DSS-12), a 34-meter standard telescope, operational for outreach activities
- DSS-13, a 34-meter antenna with BWG, operational for R&D
- DSS-14, a 70-meter, operational antenna
- DSS-15, a 34-meter, HEF, operational antenna
- DSS-16, a 26-meter, operational, X/Y antenna
- DSS-24, a 34-meter, operational, BWG antenna
- DSS-25, a 34-meter, operational, BWG antenna
- DSS-26, a 34-meter, operational, BWG antenna
- DSS-27, a 34-meter, operational antenna with HSB waveguide
- DSS-23, an 11-meter antenna, decommissioned from operational support. This antenna requires only custodial maintenance, that is, maintenance to ensure basic mechanical operation.
- DSS-28, a 34-meter, HSB waveguide antenna that has never been operational. This antenna requires only caretaker maintenance, that is, the protection of its exposed structural and mechanical surfaces.

This task addresses only the maintenance of nonelectronic equipment belonging to the Antenna Subsystem, that is, the maintenance of the structural, mechanical, and Cassegrain assemblies, along with the special tooling and integration that is required for this maintenance. To assist in the performance of this task, the Contractor will be provided with DSN maintenance standards, antenna specifications, and design drawings.

Maintenance tasks for these assemblies are further described in the sections following.

In support of this task, the Contractor shall:

1. Report all maintenance activities via a Computerized Maintenance Management System (CMMS).
2. Relay all unusual findings to operators, maintainers, and design engineers.
3. Implement engineering change orders (ECOs) for the antennas.

This task has a special provision:

1. The work shall be performed by antenna maintenance personnel as described in Appendix J, Contractor Staff Roles.

2.3.1 STRUCTURAL ASSEMBLY

The Contractor will be responsible for the maintenance and repair of the antenna Structural Assembly. The structural assembly consists of:

- Frame of structural steel, alloy steel, and some aluminum members, either bolted or welded together
- Concrete support pedestal under each frame

In support of this task, the Contractor shall:

1. Perform predictive and preventive maintenance on, and repair of, the antenna structural assemblies, to include:
 - a. Inspection, repair, and replacement, as necessary, of the protective coating
 - b. Inspection, repair, and replacement, as necessary, of the bolted and welded connections
 - c. Inspection and repair of structural members
 - d. Inspection, repair, and replacement, as necessary, of the concrete and grouting

2.3.2 MECHANICAL ASSEMBLY

The Contractor will be responsible for the maintenance and repair of the antenna mechanical assembly. The mechanical assembly rotates the structural assembly in both elevation and azimuth. The mechanical assembly consists of:

- Wheels and tracks
- Elevation rotation components:
 - Elevation bearing
 - Elevation drive-gear reducers
 - Elevation bull-gear assemblies

- Elevation drives (electrical and servohydraulic)
- Azimuth rotation components:
 - Rotational bearings (radial trucks and pintle bearings)
 - Azimuth drive-gear reducers
 - Azimuth bull-gear assembly (70-meter and 11-meter antennas)
 - Azimuth drive motors (electrical and servohydraulic)
 - Azimuth hydrostatic bearing assembly (70-meter antenna)
 - Azimuth wheel and track assembly
- Subreflector positioners
- Antenna hydraulic systems:
 - Hydraulic pumps
 - Hydraulic motors
 - Valves (pressure, reducing, relief, and servo)
- Cryogenic assemblies
- Other equipment

Maintenance of the mechanical assembly varies among the antennas:

- Servo hydraulic motors drive the 26-m and 70-m antennas, whereas electric motors drive the rest.
- The 70-m antenna rotates in azimuth on a hydrostatic bearing.
- The 34-m antennas rotate on a wheel-and-track system.

In support of this task, the Contractor shall perform predictive and preventive maintenance on, and repair of, the antenna mechanical assembly, to include:

1. Monitoring, inspection, lubrication, and repair of all mechanical systems
2. Monitoring, inspection, lubrication, and repair of all hydraulic systems
3. Monitoring, inspection, lubrication, and repair of all cryogenic assemblies

2.3.3 CASSEGRAIN ASSEMBLY

The Contractor will be responsible for the maintenance and repair of the Cassegrain assembly. This assembly provides each antenna with the capability to reflect RF energy into and out of the microwave feed systems. The Cassegrain system consists of the following:

- The main reflector surface (adjustable aluminum panels)
- The aluminum subreflector
- Reflective aluminum mirrors

In support of this task, the Contractor shall:

1. Clean, align, and repair the Cassegrain assembly components:
 - a. The main reflector surface
 - b. The aluminum subreflector

- c. The aluminum mirrors

2.3.4 SPECIAL TOOLING AND INSTRUMENTATION

Special tooling and instrumentation are used to support the monitoring, preventive maintenance, predictive maintenance, and repair of the structural, mechanical, and Cassegrain assemblies. The Contractor will be responsible for the maintenance and calibration, as required, of this tooling and instrumentation, and the repair of the same when necessary. The special tooling and instrumentation consist of the following:

- Handling fixtures
- Strain gauges
- Measurement equipment
- Analytical equipment
- The hydrostatic bearing instrumentation (HBI) system

In support of this task, the Contractor shall:

1. Maintain special tooling and instrumentation
2. Calibrate, as required, special tooling and instrumentation, in accordance with NPD 8730.1, *Metrology and Calibration*.
3. Repair, as necessary, special tooling and instrumentation.

2.4 TECHNICAL SYSTEMS MAINTENANCE

In the Technical Systems Maintenance task, the Contractor will provide a maintenance capability that supports the implementation of new capabilities, supports the preventive and predictive maintenance programs, and increases the availability of GDSCC assets.

GDSCC technical systems include mechanical, electromechanical, hydromechanical, electric, RF, data processing, communications, voice, and electronic devices, both analog and digital. Equipment identified as “operational” in DSMS Document 820-061, *DSMS Subsystem, Configuration Items, and Responsibility Definition*, is maintained by the Contractor. Technical Systems Maintenance follows the requirements of JPL Document 814-007, *DSMS Maintenance Program*.

The Contractor will perform all three levels of corrective maintenance, as defined in Appendix B, Glossary. Maintenance will be provided 24 hours a day, seven days a week.

The Complex Maintenance Facility (CMF) provides for the test and repair of DSN equipment that cannot be tested or repaired at the deep-space communication complexes (DSCCs). The CMF provides repair, maintenance, and calibration for mechanical, electronic, and radio-frequency components. The CMF also provides

a reference standards program traceable to the National Institute of Standards and Technology (NIST).

2.4.1 GOLDSTONE TECHNICAL SYSTEM MAINTENANCE

In support of the Goldstone Technical System Maintenance task, the Contractor shall:

1. Provide preventive maintenance and Level-1 and Level-2 corrective maintenance for all technical equipment at the SPC-10, the ECC, and GDSCC front-end areas.
2. Implement new and modified equipment.
3. Support the acceptance testing of new and modified capabilities.
4. Assist the tracking complexes in Canberra, Australia (CDSCC), and Madrid, Spain (MDSCC), including travel to support major implementations, upgrades, and downtime maintenance.
5. Provide custodial maintenance of the DSS-23 and DSS-28 antennas.
6. Provide systematic-error correction tables for use in antenna pointing models.
7. Provide to the DSMS Operations Program Office parametric data reports of equipment and software reliability, maintainability, restorability, and maintenance.
8. Provide technical support for design, system safety evaluation, modification, training, and problem resolution.

This task has a special provision:

1. The Contractor shall ensure that its maintenance personnel are trained and certified.

2.4.2 NETWORK MAINTENANCE SUPPORT

In support of this task, the Contractor shall:

1. Provide a CMF that will provide depot level maintenance and repair for GDSCC and specialized maintenance and repair to all DSCCs.
 - a. Isolate and repair failures at the level of the lowest-replaceable element (LRE).
 - b. Troubleshoot, repair, maintain, calibrate, and test mechanical, electronic, and radio-frequency components
 - c. Repair, modify, test, and calibrate all test instruments at the GDSCC.

- i. Maintain a database of all calibration records, in accordance with NPD 8730.1.
 - ii. Conform to ISO 9001-2000, Quality Management Systems—Requirements.
- d. Operate and maintain a trend-analysis laboratory for predictive maintenance of mechanical and electrical equipment at the GDSCC.
 - i. Provide oil, vibration, thermographic, and ferrographic analysis on motors, pumps, and high-voltage devices.
 - ii. Collect baseline data.
- e. Repair at the CMF hydraulic system components from throughout the DSN that cannot be repaired at the DSS level. JPL will supply as GFE a large, motor-driven hydraulic supply pump and several hydraulic test stands.
- f. Within a clean environment at the CMF, operate a hydraulic test-and-calibration facility.
- g. Within a clean environment at the CMF, operate a special laboratory for the repair, test, and calibration of cryogenic RF components, including maser refrigerators, vacuum pumps and signal-waveguide couplers. JPL will provide, as government-furnished equipment (GFE), any special apparatus, such as helium leak detectors and tilt tables to simulate antenna movement in all axes.
- h. Establish and operate electronic repair capabilities in a laboratory environment. The laboratory shall contain all necessary equipment, workbenches, environmental control system, test instruments, procedures, technical library, production control system, and vendor repair support.
- i. Provide a capability to repair and calibrate RF modules.
- j. Maintain a Reference Standards Laboratory (RSL) with standards traceable to NIST. Calibrate the following standards against NIST standards and supply the calibrated standards to each DSCC annually:
 - i. DC voltage and current standards
 - ii. AC voltage and current standards
 - iii. Resistor standards
 - iv. Capacitor standards
 - v. Attenuation standards
 - vi. Phase standards
 - vii. Impedance standards
 - viii. Inductance standards
 - ix. RF power standards

- x. Torque standard
 - xi. Fluid flow standard
 - xii. Pressure standard
 - xiii. Length standard
 - xiv. Mass standard
 - xv. Gas flow standard
 - xvi. Pressure standard
- k. Establish, maintain, and document a production control system.
 - l. Establish and maintain a technical library containing current copies of applicable technical manuals and test procedures.
 - m. Prioritize CMF repair and test activities, in accordance with current tracking commitments.

This task has the following special provision:

- 1. The Contractor shall ensure that its maintenance personnel are trained and certified to repair, modify, calibrate, and test the RF, electrical, electronic, and hydraulic equipment at the DSN.

2.5 FACILITIES AND INFRASTRUCTURE MAINTENANCE AND CONSTRUCTION/MODIFICATION

The Contractor will be responsible for maintaining all buildings and grounds at the GDSCC, except for the buildings at the Pioneer and Mojave sites, regardless of the corporate affiliations of the building occupants or contents.

The Contractor will be responsible for maintaining and operating the heavy equipment at the GDSCC.

The GDSCC infrastructure consists of:

- Buildings and towers
- A technical plant:
 - Heating, ventilation, and air conditioning
 - Plumbing
 - Electrical system
 - Power lines, power plant, diesel generators
 - Water supply
- Roads
- A septic system and oxidation ponds
- A drainage system
- The Echo Site Class-III landfill
- Storage yards
- An airport

Periodically, the Contractor will be involved in constructing new facilities or in modifying existing facilities. For minor projects for the construction of facilities (CoF) (i.e., those projects valued at \$500,000 or less), the Contractor will prepare the statement of work (SOW), conduct the procurement activity, and supervise the actual construction activities.

In support of this task, the Contractor shall:

1. Conduct a facilities maintenance program for the GDSCC, including all GDSCC buildings and infrastructure.
2. Apply NASA Reliability-Centered Maintenance (RCM) principles (NPG 8831.2, Facilities Maintenance Management), to meet NASA's Critical Facilities Maintenance Assessment (CFMA) objectives.
3. Ensure that its facilities maintenance program complies with NPD 8831.1 Management of Facilities Maintenance. To help implement its facilities maintenance program, follow the guidelines in NPG 8831.2.
4. Generate facilities maintenance functional performance metrics reports, as described in M021, Performance Metrics, in the CDRL.
5. Generate an annual program operating plan (POP) for facilities maintenance, as described in the M018, Annual Operating Plan (AOP), in the CDRL.
6. Maintain buildings so that delicate electronic and electromechanical equipment operates in a clean environment, and personnel work in areas that comply with federal and state health codes.
7. Protect exposed building areas from environmental damage, repairing or replacing the roof and painting the buildings as necessary.
8. Provide a lock-and-key function, including key assignment, maintenance of lock and key records, and key replacement.
9. Ensure that equipment and heavy equipment that is stored outside is protected from the elements.
10. For critical facilities, apply NASA RCM principles to meet the objectives of NASA's CFMA program.

2.5.1 TECHNICAL PLANT MAINTENANCE

The Contractor will maintain the technical plant.

2.5.1.1 Heating, Ventilation, and Air Conditioning

Heating, ventilation, and air conditioning (HVAC) equipment and controls include air conditioning (including building and antenna-mounted air conditioning),

cooling towers, chillers, heat exchangers, liquefied petroleum gas (LPG) boilers, heat pumps, water heaters, resistance heating strips, and radiant heating panels.

In support of this task, the Contractor shall:

1. Perform preventive, predictive, and corrective maintenance on all HVAC equipment and controls.

2.5.1.2 Plumbing

The Contractor will be responsible for all plumbing maintenance.

In support of this task, the Contractor shall:

1. Perform preventive, predictive, and corrective maintenance on all GDSCC plumbing, including:
 - a. Plumbing fixtures (sinks, toilets, urinals)
 - b. Piping (all water pipes, those pipes feeding the oxidation ponds, and the septic tanks)
 - c. Water storage tanks (potable and nonpotable), valves, and pumps
 - d. Fire suppression and protection systems
 - e. Reverse-osmosis water-purification system
 - f. LPG storage tanks

2.5.1.3 Electrical and Power Distribution System

The electrical equipment and power distribution systems include:

- The primary, 12-kV power-distribution system, consisting of pole lines, underground cables, circuit breakers, and transformers
- The secondary power-distribution system, consisting of 2400-V and 110-V systems, circuit breakers, and transformers
- Uninterruptable power supply (UPS) systems
- Safety and electronic grounding systems
- Incandescent lighting
- Fluorescent lighting

The primary source of power for the GDSCC is firm power from SCE. The firm power enters the GDSCC at three points:

- A circuit breaker near the main guard gate
- A circuit breaker at the Apollo station
- A circuit breaker at the Mars station

SCE now maintains the pole-mounted power lines and poles.

In support of this task, the Contractor shall:

1. Perform preventive, predictive, and corrective maintenance on the electrical equipment and power distribution systems.
2. Maintain the power distribution system per NFPA 70, *National Electric Code*; NFPA 70B, *Recommended Practice for Electrical Equipment Maintenance*; and NFPA 70E, *Standard for Electrical Safety Requirements for Employee Workplaces*.
3. Maintain UPS systems.
4. Maintain the safety and electronic grounding systems per NEC Article 250.
5. Inspect all incoming equipment for compliance with safety grounding requirements per NEC Article 250.
6. Visually inspect all pole-mounted and underground 12-kV transmission lines, including the treated wooden poles, associated circuit breakers, transformers, and switchgear.
 - a. Any person who climbs a pole shall be certified to do so.
7. Maintain underground 12-kV transmission lines.

2.5.1.4 Power Plant

GDSCC maintains a 9-MW backup electrical generation capability. This capability is used to ensure a continuous electrical power supply. It is used during periods of peak demand on SCE power and during periods of critical mission support.

In support of this task, the Contractor shall:

1. Perform preventive and corrective maintenance of the motor-generator sets, diesel generators, switchgear, and other peripherals, including batteries, circuit breakers, and switches.
2. Change the oil in the generators, change filters, clean and adjust contacts, and replace battery-distilled water as required by use.
3. Following manufacturer's recommendations for diesel engines (usually after 10,000–15,000 hours of operation), perform top-end overhauls.
4. Following manufacturer's recommendations for diesel engines (usually after 20,000–30,000 hours of operation), completely tear down and rebuild the engines, and replace all marginal components in the fuel system, cooling system, and lubricating oil system.

5. Ensure that the generators will start up automatically and that the power distribution system will switch over to generator power, should commercial power fail.
6. Maintain and regularly test:
 - a. The load-shedding capability of the GDSCC grid-power control system
 - b. Echo-to-Mars plant tie-line functions
 - c. The automatic switching capability between commercial power and local power.
7. Maintain system redundancy in a high state of readiness.

2.5.1.5 Water Supply

GDSCC has seven water tanks, with a combined capacity of 5.3 million liters, to store water that is pumped in from Fort Irwin. Water is conveyed by 45 miles of underground water lines, with associated pumps and valves.

In support of this task, the Contractor shall:

1. Periodically inspect the water supply system, including the storage tanks, to determine the integrity of the system.
2. Test the water supply, to ensure that it meet standards for potable water, per 22 CCR 64683 and 22 CCR 64684.
3. Perform preventive and corrective maintenance on the water supply system. Test the water supply after any maintenance activity.

2.5.1.6 Airport

The GDSCC airport is located at Goldstone Dry Lake. The Contractor will be responsible for maintaining the airport's runway and taxiway.

In support of this task, the Contractor shall:

1. Provide preventive maintenance of the shelter, runway, and taxiway, to ensure safe operating conditions on the runway.
 - a. Sweep away all foreign objects and deposits of windblown or water-deposited sand.
 - b. Patch holes, replace sections, and slurry seal the runway and taxiway, as required.
2. Keep the windsocks in good condition, replacing them when they are no longer serviceable.

3. Restripe the runway and taxiway with high-visibility paint, in accordance with NASA requirements, when necessary to ensure safe operations.

2.5.1.7 Buildings

The Contractor will modify buildings (e.g., remove or install interior walls, doors, or windows) to support the installation of new equipment or capabilities.

In support of this task, the Contractor shall:

1. Modify buildings to support the installation of new equipment or capabilities.

2.5.1.8 Roads and Drainage Systems

The Roads and Drainage Systems task applies to all main roads except for NASA Road from the GDSCC main entrance to Barstow Road, the access roads leading to all the DSSs, and the apron around each antenna.

In support of this task, the Contractor shall:

1. Maintain all applicable roads, antenna aprons, and parking lots, to ensure that they are in drivable and safe condition.
 - a. As necessary, apply slurry seal coat to all paved surfaces.
 - b. Keep all road surfaces reasonably clear of foreign objects, including sand.
 - c. As necessary, patch all holes and replace sections of road.
2. Maintain sufficient drainage along roadside shoulders and drainage ditches to protect the road surfaces from heavy water flow, regrading the drainage as necessary to protect road surfaces from excessive flooding.
3. Repaint the centerline of the roads with high-visibility paint, in a color specified by the California Department of Transportation Specification #8010-20B for Paint, Waterborne Traffic Line, White, Yellow and Black.

2.5.1.9 Septic System and Oxidation Ponds

In support of the Septic System and Oxidation Ponds task, the Contractor shall:

1. Clear all oxidation ponds of debris and weeds.
2. If a pond has been in use during the year, drain the pond, clean the pond bottom, and dress the slopes.
3. Periodically inspect all septic tanks, and provide for the pumping out of these tanks when the tanks approach full capacity.

4. Maintain the sewage system in such manner that the system will pass, without exceptions, the semiannual inspections conducted under the auspices of the State of California Environmental Protection Agency.

2.5.1.10 Landfill

The Contractor will be responsible for monitoring the GDSCC Echo Site Class-III landfill. JPL and NASA are aware of potential issues related to groundwater contamination that may be caused by the landfill's contents. The Contractor is not responsible for the resolution of these issues.

In support of this task, the Contractor shall:

1. Ensure that the landfill complies with the California Integrated Waste Management Board Title 27 CCR.
2. Process and analyze data from the landfill's automatic moisture-probe monitoring system.
 - a. Correlate these data with data from an installed automatic weather monitoring station at the site.
 - b. Submit the landfill data quarterly to the Lahontan Regional Water Quality Control Board.
 - c. Maintain copies of landfill data on site at the GDSCC for inspection.
3. Notify the CTM and the JPL Environmental Affairs Office of all Echo Landfill-related inspections.
4. Provide the CTM and the JPL Environmental Affairs Office with copies of all Echo Landfill-related inspection reports, including inspections initiated by any California regulatory agency (state or county).
5. Provide the CTM and the JPL Environmental Affairs Office with copies of groundwater monitoring and vapor monitoring data.
6. At the landfill:
 - a. Maintain the following systems:
 - i. Moisture-probe monitoring system
 - ii. Weather monitoring system
 - iii. Solar panel/battery-powering system
 - iv. Lightning protection system
 - b. Maintain the communications line between the landfill and the PC data collection system at the Echo Site Safety and Environmental Compliance Office.

7. Periodically inspect the landfill cover to determine whether its structural integrity has been compromised.
8. Maintain the landfill cover material and the contour surface drainage design in the configuration agreed to by the JPL Environmental Affairs Office and the State of California.

2.5.1.11 DSN Facilities Master Plan

In support of the DSN Facilities Master Plan task, the Contractor shall:

1. Maintain the DSMS 890-165, *Directory of DSCC Facilities: the Goldstone Gold Book*, by updating it to reflect the current state of GDSCC facilities and infrastructure.

2.5.2 HEAVY EQUIPMENT MAINTENANCE

The Contractor will frequently use heavy equipment to move heavy, bulky objects and lift them at least as high as 150 feet. Heavy equipment is required for road maintenance, drainage ditch construction, and trash disposal, for example. Heavy-equipment maintenance includes the repair of mechanical, hydraulic, and electrical systems; sheet metal; and paint.

In support of this task, the Contractor shall:

1. Maintain heavy equipment in accordance with current Cal/OSHA requirements (Title 8) and obtain all required safety and operational certifications.

This task has a special provision:

1. The Contractor shall train and certify (in its training and certification program) all GDSCC–resident operators and maintainers of heavy equipment.

2.6 ADVANCED SYSTEMS OPERATIONS AND MAINTENANCE

JPL uses the Venus site and its 34-meter beam waveguide antenna, DSS-13, to conduct experiments leading to the development of new technologies for NASA–JPL. The Venus site plays a critical role in technology development and scientific research for new microwave and system instrumentation concepts, for DSMS system-level technology demonstration, and for scientific technology development and observation. Contractors operating and maintaining the Venus site will maintain a close association with technical divisions at JPL.

2.6.1 GDSCC TECHNOLOGY AND SCIENCE SUPPORT

The GDSCC Technology and Science Support task plays a critical role in technology development and scientific research in two primary contexts: (a) the operation and maintenance of DSS-13, the Venus site, and (b) the operation and maintenance of non-configuration-controlled scientific instrumentation.

DSS-13 is operated as a dedicated R&D station for new microwave and system instrumentation concepts, for DSMS system-level technology demonstration, and for scientific technology development and observation. In this capacity, the station maintains a close association with technical divisions at JPL. DSS-13 also supports non-flight-project experiments (such as RFI characterization searches) on an as-scheduled basis.

Non-configuration-controlled scientific instrumentation supports DSN Science experiments in radio astronomy (R/A), including VLBI, radar astronomy, and radio science throughout the complex, especially at DSS-13 and DSS-14.

This task also includes maintaining and operating the GAVRT antenna(s), as described in GAVRT MOU 99-720-149. Personnel for all of these science activities often work directly with JPL engineers and scientists.

Both DSS-13- and DSS-14-based work requires:

- Reviewing experimenter's test plans
- Furnishing technical advice
- Determining if existing technical resources and operational procedures are adequate to support planned activities
- Maintaining the non-transferred equipment in a functional state
- Designing, fabricating, and implementing prototype equipment and test fixtures
- Returning the equipment to a standard configuration after any activities that require a combination of DSN-configuration controlled and non-configuration-controlled scientific instrumentation

A high level of technical expertise is required to operate the DSS-13 core equipment and the DSS-14 radio astronomy and radar equipment. Operational support consists of a number of scenarios:

- Collaborating onsite (at GDSCC) and remotely with visiting investigators
- Conducting observations independently from detailed, investigator-provided, sequences of events
- Executing investigator-provided scripts for automated operations
- Developing automation scripts from investigator-provided sequences of events

In support of this task, the Contractor shall:

1. Provide VLBI support:
 - a. Operate the MkIV, MkV, and S2 VLBI data acquisition terminals and the PC Field System (PCFS), a monitoring and control system for these terminals.
 - b. When necessary, use DSS-13 in conjunction with DSN operational antennas for DSN VLBI operations.
2. Provide antenna calibration support:

- a. Make precision radiometry measurements.
- b. Use JPL-developed tools to make measurements required for determining antenna gain and efficiency and for developing pointing models.
- c. Detect substandard antenna performance.
3. Provide spectrometer support:
 - a. Operate wide-bandwidth, high-resolution spectrometers, such as the Wide-Band Spectrum Analyzer (WBSA).
 - b. Help investigators perform spectroscopy.
4. Administer computer systems on Sun OS/Solaris, HP-UX, and Linux platforms.
5. Provide software support:
 - a. Perform limited computer programming, employing Unix shell scripting, Tcl/Tk scripting, Visual Basic, and the C language.
 - b. Develop and maintain Web-based graphical documentation.
6. Provide radio- and microwave-frequency instrument support service:
 - a. Test, diagnose, operate, and maintain the wide range of radio- and microwave-frequency instrumentation fielded at the GDSCC, including GPIB/IEEE 488 bus-based systems, HP modular measurement systems, special-purpose mixers, synthesizers, downconverters, and calibration devices such as noise diodes and ambient loads.
 - b. Provide limited design, engineering, and implementation capability.
7. Provide GSSR service:
 - a. Operate the GSSR controller.
 - b. Load provided predict files into the Programmable Local Oscillators (PLOs), which remove Doppler shifting on receive, and impose Doppler shifting on transmit.
 - c. Perform boresights as needed to improve pointing in real time.
 - d. Create comprehensive log files of experiments.
 - e. Diagnose problems in the GSSR hardware located in the DSS-14 pedestal.
 - f. Follow checklists for setup of various radar configurations.

- g. Monitor the subreflector controller and the antenna pointing assembly, as well as the PLOs and high-power transmitter.
- 8. Provide GAVRT support service:
 - a. Perform engineering support, requiring the services described in items 1–6, for equipment located at the GDSCC that is used by the GAVRT educational outreach project.
- 9. Provide DSS-13 (Venus site) maintenance service. Within the buildings of DSS-13, maintain, without degradation or loss of performance, prototype, experimental, test bed, and developmental equipment and systems, including:
 - a. Media calibration/weather station
 - b. Low-noise receiving systems at S-band, X-band, Ku-band, K-band, Ka-band, Q-band, and W-band
 - c. Simultaneous antenna pointing and tracking systems
 - d. X-band and Ka-band transmitters
 - e. Intermediate-frequency (IF) signal-distribution systems
 - f. Back-end processing systems for radiometry, VLBI, spectroscopy, full-spectrum recording (including delta-differenced one-way range [DDOR]), and radar processing
 - g. Capability for monitoring and control
- 10. Provide special DSS-14 R&D cone and pedestal maintenance service. Maintain, without degradation or loss of performance, prototype, experimental, test bed and developmental equipment and systems, including:
 - a. Low-noise receiving systems at S-band, L-band, X-band, and K-band
 - b. High-power X-band transmitters
 - c. IF signal distribution systems
 - d. Back-end processing systems for radiometry, spectroscopy, and radar operation and processing
 - e. Capability for monitoring and control
- 11. Provide user results and summary reports:
 - a. Generate user results reports, including a performance summary critique, for all activities in response to the specified deliverable requirements. (The user, or station proxy, is responsible for input to the performance critique for each activity.)

- b. Submit monthly tabulated or summary reports describing GDSCC Science and Technology activities to the IND Research & Development Project Element Manager (R&D PEM) and the DSN Science Service System Manager (SSM).
- 12. Provide performance metrics:
 - a. Tabulate and monitor customer feedback for each activity.
 - b. For each activity, use a simple automated request (e-mail or Web-based form) to gather user feedback.

This task has a special provision:

- 1. The Contractor shall provide a CRDE who is qualified as described in Appendix J, Contractor Staff Roles.

2.6.2 HIGH-POWER TRANSMITTER TEST FACILITY

The DSS-13 High-Power Transmitter Test Facility (HPTTF) is used for designing, developing, and testing high-power microwave transmitters, subsystems, and components. It supports the unique requirements of the GSSR, and its facility tests the X-band radar components, including the 250-kW CW klystrons. The HPTTF complements and supports the DSN high-power 500-kW CW S-band transmitters and serves as a test bed for design and development support of these assets.

The HPTTF is the central test facility for all of the high-power RF uplink requirements in the DSN. Its support at low power includes the DSS-13 20-kW X-band systems in the pedestal of DSS-13. Operations and maintenance of these transmitters extends to high-voltage systems, cooling systems, advanced high-power microwave components, and power-combining technologies.

In support of this task, the Contractor shall:

- 1. Participate in development activities.
- 2. Maintain and perform R&D for the DSS-13 HPTTF and support JPL-directed transmitter activities at DSS-13.
- 3. Maintain cognizance of the two high-power, 500-kW R&D transmitter systems (S-band and X-band).
- 4. Review transmitter status, determine the need for upgrade or modifications, and perform installation.
- 5. Engineer, design, fabricate, install, and test R&D transmitter system equipment or other supporting hardware.
- 6. Support high-power transmitter operations (i.e., mapping solar system objects) and other tracking duties.

7. Perform R&D engineering-level assembly and fabrication from rough drawings and sketches.
 - a. Modify or create drawings or sketches to reflect work done.
 - b. Release drawings to the JPL Product Data Management System (PDMS) as required.
8. Generate, validate, and apply test procedures to ensure satisfactory operation of assigned equipment.
9. Use the latest welding, brazing, heliarc, and silver soldering techniques.
 - a. Perform various machine shop tasks that involve operating machine tool equipment such as lathes, milling machines, drill presses, saws, shears, and brakes to a high level of accuracy.
10. Provide weekly status reports to the CTM.
11. Provide performance metrics for the following:
 - a. Minimal downtime of the GSSR or DSN high-power transmitter.
 - b. No degradation in the mean time to repair (MTTR) of the GSSR or DSN high-power transmitters.
 - c. On-time delivery of products, design services, or hardware, including documentation. (On-time delivery of hardware is measured against developed schedules as a new task is defined and parameters are set.)
 - d. Customer satisfaction for service performed, as determined by customer surveys.

This task has a special provision:

1. The Contractor shall provide HPTTF Staff qualified as described in Appendix J, Contractor Staff Roles.

2.7 TECHNICAL SERVICES

Technical Services are functions that support GDSCC operations and maintenance. Technical Services include workmanship assurance, documentation, training, logistics, supply disbursement, and GDSCC procurements.

2.7.1 WORKMANSHIP ASSURANCE

The Contractor will assure the workmanship of all of repairs and modifications at the GDSCC.

In support of this task, the Contractor shall:

1. Establish and follow a Workmanship Assurance (WA) Program for all the repair and modification activities that it conducts at the GDSCC.
2. Ensure that the WA Program complies with DSMS Document 874-021, *Workmanship Assurance Program for Goldstone DSCC*, and DSMS 813-012, *Quality Assurance Program Plan for the Deep Space Network Hardware*.
3. Correct all discrepancies identified in the report of the annual audit performed by the JPL Quality Assurance organization and the JPL DSN WA Manager.

2.7.2 DOCUMENTATION

The Contractor will provide documentation services and keep necessary records.

In support of this task, the Contractor shall:

1. Provide a documentation production, reproduction, and distribution capability at the GDSCC.
2. Maintain a central repository of records and historical documentation to allow operations and maintenance staff to perform data analysis and forecast planning, to aid in JPL problem investigations, and to provide event traceability.
3. Maintain records of all training, licensing, and permits that are required to meet Contractor, JPL, and government audits.
4. Retain all documents and records for the duration of the contract.

2.7.3 TRAINING AND CERTIFICATION

The Contractor will provide training and certification for its GDSCC employees.

In support of this task, the Contractor shall:

1. Develop and administer a comprehensive training and certification program that includes:
 - a. New-employee orientation.
 - b. Specialized training and certification for RF, digital, mechanical, electromechanical, and hydromechanical maintenance personnel.
 - c. Specialized training and certification for real-time operations personnel, ensuring that they are thoroughly trained in the procedures for tracking operations.

2.7.4 LOGISTICS

The Contractor will implement a logistics system to ensure that the GDSCC receives equipment, spare parts, supplies, data, and documentation in a timely manner.

In support of this task, the Contractor shall:

1. Develop and administer a logistics system that:
 - a. Allows the GDSCC to ship equipment, supplies, data, and documentation to other DSN facilities.
 - b. Includes shipping, receiving, warehousing, supply issuance, and transportation activities.
2. Keep a thorough accounting of all materials processed by this task.
3. Provide warehousing to hold sufficient quantities of materials and equipment to support GDSCC operations:
 - a. Secure warehousing for the GDSCC spares.
 - b. Provide an inventory control system to control all warehousing and supply functions.

2.7.5 SUPPLY DISBURSEMENT

The Contractor will disburse materials and supplies.

In support of this task, the Contractor shall:

1. Control disbursement of all material and supplies, maintaining full accountability for all material and supplies issued.
2. Operate a supply disbursement function that provides full accountability by using an issue/receipt voucher process.

2.7.6 GDSCC PROCUREMENTS

The Contractor is responsible for any procurement, including subcontracts, that it requires to support the GDSCC.

In support this task, the Contractor shall:

1. Establish a procurement capability. The Contractor procurement capability shall guarantee that all materials and supplies are obtained in a cost-effective and timely manner, and that no GDSCC commitment is jeopardized by the late delivery of material and supplies.
 - a. Provide the procurement capability during weekday day-shift hours at GDSCC.

- b. Provide an emergency-procurement capability outside of weekday day-shift hours for GDSCC.
- 2. Operate the procurement capability in accordance with JPL, NASA, and Contractor procurement standards.
- 3. Provide for the purchasing and subcontracting of materials and services, including the equipment required to perform the tasks described in this document.
- 4. Provide access to procurement records to JPL, the California Institute of Technology, and U.S. Government auditors as required.

3

NETWORK OPERATIONS AND SERVICES

This section describes both the real-time tasks required to control, monitor, and coordinate Deep Space Network tracking operations, and the non-real time Support Services required to globally conduct network operations.

Real-time network operations tasks include:

- Operate and maintain the Deep Space Operations Control Center (DSOCC)
- Deliver committed data to Deep Space Missions Systems (DSMS) customers
- Plan, document, and train for mission-specific operations
- Schedule network resources
- Monitor network system performance
- Generate, document, and maintain network operations procedures

Non-real-time support services include:

- Generate and maintain mission-independent standard operating procedures
- Generate mission-specific operations plans
- Administer the engineering change management (ECM) process
- Operate and maintain a development and test facility
- Maintain performance measurement software and report on network performance
- Maintain and manage network documentation
- Provide maintenance, sparing support, and logistics
- Provide ionospheric, tropospheric, and Earth-orientation data to flight-project customers
- Perform radio-metric data conditioning.

3.1

NETWORK OPERATIONS

To ensure that the DSMS provides correct and complete data and information flow through all of the data and control interfaces to flight project customers, the ongoing, worldwide DSMS flight project support operations must be monitored, controlled, and coordinated. Network operations performs this high-level control function. Network operations provides the overall network control, monitor, and analysis of the real-time tracking operations of the DSMS and maintains continuous voice and data contact with each DSN complex. The communications circuits to support these functions are provided by the NASA Information Services Network (NISN). The Contractor will maintain terminal equipment provided by JPL, coordinating restoration of failed circuits with NISN and the circuit vendors, and for participating in integration testing of new circuits and upgrades of communications equipment.

Network operations also provides the operation of a data records system that gathers, assembles, stores, and distributes all necessary operational data records of the DSN. Network operations coordinates and resolves with flight projects real-

time problems/issues with ongoing flight project supports, works with the flight projects to resolve asset contention issues arising in real-time, coordinates Spacecraft Emergency issues in real-time, ensures the opening of discrepancy reports (DRs) as required, and alerts DSMS management to serious problems as they arise within the network.

Network operations performs real-time level-zero data processing on DSN radio-metric, telemetry, command, and monitor data, and distributes these data to the flight projects (front end operations of the Advanced Multi-Mission Operations System [AMMOS]).

Network operations functions will remain located at JPL and will be provided 24 hours a day, seven days a week.

Network support services compose all the support functions directly related to the DSMS service execution process. These functions include planning; testing; generating and providing support products used for tracking activities; data acquisition; processing, recording, and distribution of customer data; network performance analysis and anomaly recovery; and documenting discrepancies.

Comprised of the following operational elements, the DSOCC provides operational support to flight projects:

- Network Operations Control Center (NOCC), building 230 1st floor
- Network Support Subsystem (NSS), building 230 basement
- Network Very Long Base Interferometry (VLBI) Processor (NVP), building 230 basement
- Data System Processing Area (DSPA), building 230 3rd floor
- Wide Band VLBI Correlator (WBC), building 502 1st floor (Contractor-leased facility)
- Remote Operations Support Area (ROSA), building 507 1st floor (Contractor leased facility)
- Central Communications Terminal (CCT), building 230 basement
- Data Systems Operations (DSO), building 230, 1st floor
 - Telemetry Interface System (TIS), building 230, 3rd floor
 - Ground Interface Facility (GIF), building 230, 3rd floor
 - Special Function Gateway (SFG), building 230, basement
 - Tracking Data Delivery System (TDDS), building 230, 3rd floor
 - Telemetry Delivery System (TDS), building 230, 3rd floor
 - Distributed Objects Manager (DOM), building 230, 3rd floor
 - Space Link Extension (SLE), building 230, 3rd floor
 - Data Monitor Display (DMD), building 230 3rd floor
 - Monitor Interface Assembly (MIA), building 230, 3rd floor
 - Tracking, Telemetry, Command and Data Management System (TTC&DM), building 230, 3rd floor

These operational elements will remain at JPL or within the Pasadena area.

Non-real time functions are currently conducted from a variety of Contractor leased facilities in Pasadena and elsewhere, including:

- WBC, building 502 1st floor, Pasadena, CA
- Development and Test Facility (DTF), building 605, Altadena, CA
- Compatibility Test Trailer (CTT), building 605, Altadena, CA
- Merritt Island Launch (MIL), Kennedy Space Center (KSC), FL
- DSN Logistics Facility (DLF), building 504, Pasadena, CA
- Development facility (hardware and software), building 510, Pasadena, CA
- Operations Support Facilities (Scheduling, ECM, Support Products, Software Production Management and Control [SPMC], etc.), building 507 and 510, Pasadena, CA

3.1.1 CONTROL CENTER REAL-TIME OPERATIONS

3.1.1.1 Real-Time Operations Control and Monitoring

Real-time coordination and control of DSMS operations is required to provide committed DSMS operational support to all flight project customers. Network operations performs DSMS real-time coordination and control 24 hours a day, seven days a week. This task provides a central point of monitor and control for the worldwide DSMS support facilities and a central point of contact for all of the flight project customers.

Network operations coordinates resource conflict resolution and failure recovery actions within the DSN. The network-operations leader (“Operations Chief”) represents DSMS Management for all ongoing DSMS flight project operational support, and is the ultimate real-time authority for ongoing DSMS operations.

Network operations also maintains the cognizance and recording of the current DSMS status and support capabilities. Voice communications will be established and maintained within the DSMS Support Facilities. Station configuration and performance will be monitored to ensure compliance with published requirements, standards and limits, and the timely execution of planned sequences and procedures. Accurate and complete records of events occurring in the course of tracking operations will be maintained, along with detailed descriptions of anomalies or failures and all perturbations in the delivery of committed data. Network operations will ensure that all data losses are formally documented in DRs. Supporting data, such as predictions, schedules, and SOE will be provided to the tracking stations in a timely manner. Assistance will be provided for failure recovery action, primarily by providing equipment restoral priorities to match flight project requirements and priorities. Current equipment status of the DSN will be maintained through daily DSN status reports.

Because of the heavy user load on the DSN, spacecraft tracking activities are typically conducted continuously. To assure that all the flight project customers of the DSN receive the quality and quantity of data they need, it is necessary to monitor the configuration of and analyze the performance of the DSN monitor and

control, telemetry, tracking, command, radio science, and VLBI systems, and the AMMOS front-end data processing subsystems. This task comprises monitoring the configuration of DSN systems and comparing them to mission-dependent parameters published in the associated network operations plans, and monitoring the received data, and comparing it with expected values. The station configuration will be verified prior to command transmissions. The command system status will be monitored prior to command transmission. All command transmissions will be verified. The telemetry system will be monitored and its performance analyzed using various spacecraft and ground system parameters. Telemetry predictions will be adjusted in real time in response to telemetry system or spacecraft configuration changes.

The AMMOS comprises hardware and software used to receive the captured data from the DSN. The AMMOS performs level-zero data processing, provides archival and distribution services for spacecraft telemetry data, spacecraft tracking data, and ground-system-monitor data for the flight projects.

Network operations for AMMOS consists of:

- Monitoring the AMMOS ground system, including monitoring mission-data system connections, project databases, application servers, firewalls, and intrusion-detection equipment.
- Providing support services, including AMMOS data-system monitoring, data acquisition, level-zero data processing, data recording, problem analysis, anomaly recovery, system testing, and the distribution of customer data.

In support of this task, the Contractor shall:

1. Operate all DSOC elements, providing real-time operations 24 hours a day, seven days a week.
2. Provide the central point for monitoring, establishing voice and data communications paths (provided by NISN), controlling, and coordinating DSMS resources committed to the support of DSMS scheduled activities.
3. Coordinate with the DSCCs, Project Operations Control Centers (POCCs), and JPL and Contractor personnel to ensure support of DSN scheduled activities.
4. Function as the central "help" facility for flight project customers.
5. Coordinate all problems with the DSCCs and report data outages through the JPL Discrepancy Reporting Management System (DRMS) in accordance with DSN document 841-001, *Standard Operations Plan for the Deep Space Network*, and DSN Document 842-50-311, *DSN Discrepancy Reporting Policy and Operations/Management of the Discrepancy Reporting Management System*.

6. Coordinate Network resource conflict resolution and failure recovery actions as required.
7. Provide real-time reports to DSMS Operations Program Office personnel.
8. Provide accurate and complete records of events and actions for each scheduled event.
9. Each morning, prepare and publish a daily status report (DSR) that summarizes each support provided, DSN equipment status, and provides details on any problems encountered.
10. Make provisions for additional specialists to support flight project critical events.
11. Monitor station configuration and performance to ensure compliance with published requirements, standards, and limits.
12. Ensure that operators maintain and enhance proficiency through participation in training classes and exercises, in addition to on-the-job experience.
13. Document data losses in DRs.
14. Ensure supporting data, such as predictions, schedules, and SOE are provided to the tracking stations in a timely manner.
15. Monitor the configuration of and analyze the performance of the DSN monitor and control, telemetry, tracking, command, radio science, and VLBI systems.
16. Provide assistance to stations for failure recovery action, primarily by prioritizing equipment restoration to match mission requirements.
17. Establish required AMMOS system configurations for flight and test activities.
18. Maintain and operate AMMOS data systems and establish backup configurations.
19. Coordinate the reception, processing, and distribution of spacecraft telemetry, radio-metric, and DSN-monitor data.
20. Maintain space link extension (SLE) password files for flight projects.
21. Provide fault isolation analysis of operational problems.
22. Archive spacecraft data.
23. Maintain, make available, and archive a catalog and library of project data.

24. Operate, maintain, and system-administer all DSMS equipment and software within the DSMS firewall, including the firewall and local area networks (LANs) and excluding flight-project hardware, software, and connections to the firewall.
25. Lead a system administration team consisting of system administrators from the Contractor, DSMS, and flight projects, to ensure the overall coordination of the configuration of workstation AMMOS software.
26. Verify that the project workstations operating within the DSMS firewall meet DSMS IT security and configuration requirements.
27. Perform these functions at the ECC when it is activated.
28. Attend operations working groups and technical interchange meetings at the GDSCC, Pasadena, and the overseas complexes.

3.1.1.2 Option to Relocate NOCC and Data Systems Operations Monitor Functions

The NOCC and the Data Systems Operations monitor functions of the AMMOS front-end operations reside in Building 230. The DSMS Operations Program Office is considering relocating these functions to the Pasadena area. Should these functions be relocated, the Contractor will perform the relocation.

In supporting this potential task, the Contractor shall provide, as an option:

1. Relocation of the NOCC and Data Systems Operations monitor functions to the Pasadena area:
 - a. A control area that is expandable up to 50% without relocating to another facility and that accommodates 10 positions consisting of:
 - i. Fifty-one monitors and associated workstations
 - ii. Ten Voice-Operational Communications Assembly (VOCA) stations
 - iii. Three stand-alone administrative workstations
 - iv. Two 50-inch plasma-screen monitors.
 - v. Four laser printers, one facsimile machine, and one color copier.
 - b. Console space to accommodate 10 real-time operations personnel. The Contractor shall staff eight of these positions 24 hours a day, seven days a week; two additional positions shall be provide for Contractor and DSMS Management personnel, during critical activities.
 - c. Office space for Contractor non-real-time support staff, Contractor management, and DSMS management.
 - d. Space for Contractor technical advisors. Consider collocating the ROSA.

- e. A location no further than 12 miles from JPL and preferably within 2 miles.
- f. Two T1 circuits to provide voice and data communications between the (new) NOCC and building 230.
- g. Compliance with physical security requirements (NPG 1620.1, *Security Procedures and Guidelines*) and IT security requirements (NPG 2810.1, *Security of Information Technology*).
- h. A conference room.
- i. A public and VIP viewing area, separate from the operational area.
- j. Storage space for work-related material, documentation, office supplies, and personal effects.
- k. An uninterruptible power supply (UPS) for extended, self-contained operations up to eight hours.

3.1.1.3 Central Communications Terminal Operations

The Central Communications Terminal Operations task includes operating the CCT in accordance with the following DSMS 848 document series procedures:

- Managing a configuration-controlled communications system that includes provision for real-time changes in response to requests from the network operations lead.
- Coordinating with commercial carriers.

In support of this task, the Contractor shall:

1. Operate the CCT 24 hours a day, seven days a week.
2. Monitor and control DSMS communications equipment at remote sites, overseas complexes, and the AMMOS Backbone LAN.
3. Establish and maintain voice and data communications to DSMS customers and facilities during scheduled activities.
4. Monitor the status of the end-to-end data delivery across the DSN and AMMOS for communications services.
5. Provide the central control point for coordinating communications services with commercial carriers, NISN, and DSMS customers.
6. Provide monthly reports on communications network performance and usage, and special reports as required.

7. Operate the DSOCC equipment used to record, process, monitor, distribute, and archive DSN data products.
8. Maintain accountability records for all customer data deliverables including real-time and post-pass deliverables and post-pass gap filling.
9. Operate the Ground Communications System (GCS) in the CCT, including the NISN and GCS subsystems.
10. Maintain communications circuits historical records.
11. Participate in NISN-scheduled circuit acceptance testing that involves the CCT.
12. Ensure that intermediate data records (IDRs) are delivered in accordance with flight project requirements.

3.1.2 OPERATIONS SUPPORT SERVICES

The DSOCC Control Center Support Services [km1] task provides the network with the support products necessary to execute flight project support and the infrastructure required to enable the support products. It also involves maintaining the hardware, software, processes, and procedures necessary to generate the support products. Support products consist of:

- Sequences of events (SOEs)
- Antenna (angle, radio-metric, and frequency), telemetry, radio science, and VLBI predictions
- Software support files
- Orbit data files
- Delta-differenced one-way range (DDOR), and VLBI data files
- Ionospheric and tropospheric calibration-data files

In support of this task, the Contractor shall:

1. Ensure that the support products for network operations are available as required, and that committed data services are being provided to the flight project customers.
2. Generate, validate, and transmit DSN SOEs based on customer inputs.
3. Generate and validate antenna pointing, radio-metric data (Doppler and range), telemetry, radio science, and VLBI predictions according to the DSN support schedule.
4. Develop and maintain complete and accurate telecommunications database models and station view periods in the required DSOCC subsystems, for all spacecraft supported by the DSMS.

5. Maintain cognizance and configuration control of software support files (SSFs) in accordance with JPL document 841-001, *DSN Standard Operations Plan*. Coordinate the initial generation of new SSFs with Cognizant Development Engineers (CDEs), and thereafter manage changes to file parameters to account for changing conditions of the spacecraft or ground systems.
6. Provide radio-metric data support for flight project customers, including:
 - a. Validation, merging, and sorting data
 - b. Removing blunder points and other erroneous data
 - c. Correcting data, when possible
 - d. Verifying overall tracking-data quality by using prefit residuals based on a nominal trajectory
 - e. Generating orbit data files (ODFs) from radio-metric data, and delivering them to customers within the schedule agreed to in the detailed mission requirements documents (DMRs)
7. Process DDOR, clock synchronization, and frequency offset data using the network VLBI processor subsystem (NVP). Coordinate and deliver the data to the users within the schedule agreed to in the detailed mission requirements documents (DMRs).
8. Maintain cognizance over and operate the VLBI correlator subsystem, including training of support personnel for both the narrowband and wideband correlators.
9. Provide technical support and system administrators for the DSOCC computers/workstations.
10. For DSOCC systems, install software and hardware upgrades, maintain user accounts, update equipment configuration tables, maintain security of computer systems, maintain configuration control, and restore systems after backup sessions or equipment failures. This includes all hardware and software used to generate support products and the equipment comprising the DSN mail system.
11. Process tropospheric and surface meteorological data from the DSCCs and global ionospheric data into media calibrations for DSN stations. Deliver the data to customers, within the scheduled agreed to in the DMRs. Provide reports with the results of any required analyses to flight project customers.
12. Ensure that the data required for generating support products at the ECC are kept current.

13. Perform these functions at the ECC when it is activated.

3.1.3 CONTROL CENTER MAINTENANCE

The Contractor will be responsible for maintaining all the equipment in the DSOCC.

3.1.3.1 DSOCC Maintenance

The equipment at the DSOCC consists of commercially available hardware, minicomputers, microprocessors, and associated peripherals, with JPL-developed application software. The equipment consists of Sun Solaris workstations, servers, terminals, and PCs.

In support of this task, the Contractor shall:

1. Provide corrective and preventive maintenance.
2. Implement engineering change orders (ECOs) designed to upgrade, modify, change, or enhance the operation of DSOCC equipment.
3. Assist in acceptance testing of all equipment modifications at the DSOCC.
4. Provide system administration on a daily and routine basis for DSN systems and subsystems located in the DSOCC.
5. Provide vendor maintenance.
6. Coordinate equipment changes with the JPL DSMS Operations Program Office and CTM or alternate office.
7. Participate in DSN change control board meetings affecting NOCC or NOCC interfaces.

3.1.3.2 Central Communications Terminal Maintenance

To provide continuous coverage of spacecraft, the DSMS tracking complexes must be connected to the DSMS NOCC by a communications network. The CCT is the DSMS communications facility at JPL. The Contractor will maintain the CCT.

The equipment at the CCT consists of commercially available communication equipment and minicomputers with associated peripherals and software.

CCT communication equipment consists of

- Communication patch panels
- Digital communications switch
- Multiplexers
- Circuit termination devices
- Test equipment

- Central voice switch (CVS)
- Central voice terminal (CVT)
- Routers

CCT server equipment consists of:

- Disc drives
- Interface and switching controllers
- Communications terminal equipment for voice, high-speed, and wideband data transmission
- Reliable network server (RNS)
- Central data recorder (CDR)
- Special-function gateway (SFG)

In support of this task, the Contractor shall:

1. Provide corrective and preventive maintenance of all of the CCT equipment.
2. Implement ECOs designed to upgrade, modify, change, or enhance the operation of the CCT equipment.
3. Assist in acceptance testing of all equipment modifications at the CCT.
4. Provide system administration on a daily and routine basis for the DSN systems and subsystems located in NOCC.
5. Provide vendor maintenance where applicable.
6. Coordinate equipment changes with the JPL DSMS Operations Program Office and CTM or alternate office.
7. Participate in DSN change control board meetings affecting NOCC or NOCC interfaces.

3.1.4 PERFORMANCE ANALYSIS

3.1.4.1 Performance Analysis

The Contractor will regularly monitor the performance of DSN systems, subsystems, and assemblies and periodically analyze the performance data, to determine whether DSN performance parameters such as availability and reliability are within requirements. It also allows the Contractor to detect adverse, long-term trends in these parameters, so that solutions such as upgrades or replacement can be planned.

Network operations staff must know the systems, their capabilities, and their performance standards and limits, to ensure that they can effectively monitor and evaluate the systems' performance in real time. These staff members will generate,

maintain, and update standard operating procedures used to conduct performance analysis during real-time operations.

The Contractor will provide second-level failure analysis of DRs by gathering and analyzing all available data pertaining to the problems. This analysis includes maintaining the associated database of failures for the development of long-term statistics. The Contractor will provide short-term failure history and other inputs to help DSMS Engineering determine whether the problem involves a design defect or a degradation of the system. For several systems, the Contractor will generate predictions of system performance so that they may be compared with the actual performance. The Contractor will generate standards and limits that determine the allowable range of system parameters.

Because much of the performance analysis involves the use of software, the Contractor must develop standard operating procedures for the analysis. The Contractor must have the expertise—including in-depth knowledge of the systems and statistical methods—to ensure that DSN system and subsystem performance meets the functional availability requirements imposed by the DSN and the flight projects' design parameters.

In support of this task, the Contractor shall:

1. Support the DSN systems and subsystems in areas such as maintainability, reliability, restorability, and operability.
2. Support the constant technological evolution of the DSN to implement new technology, add new capabilities in support of DSN commitments, and improve system and subsystem performance.
3. Provide mission-independent system and subsystem level training to network operations personnel. This includes understanding performance capabilities and limitations, using performance analysis tools to evaluate system performance parameters during real-time operations, and generating associated standard operations procedures.
4. Provide network operations with regularly updated status on system performance and capability limitations.
5. Provide technical assistance to DSN real-time operations during mission-critical operations such as spacecraft launches, planetary encounters or flybys, and critical spacecraft maneuvers; during preliminary mission planning; and during test and training exercises.
6. Perform thorough analyses of problems reported on DRs, and investigate and coordinate the resolution of all problems affecting DSN performance.
7. Provide link analysis for spacecraft supported by the DSN as requested. Inputs for the analysis are spacecraft design control tables (DCT) provided by the

projects; JPL document 810-005, *DSMS Telecommunications Link Design Handbook*; and input from the JPL Telecommunications and Mission Systems (TMS) managers and the Contractor's mission service element.

8. Retrieve and analyze frequency and timing subsystem (FTS) data from the DSN facilities, and, when required, direct the facilities to adjust their frequency standards to maintain FTS tolerances within system specifications.
 - a. Provide weekly FTS reports to flight project users and DSN Multimission Navigation.
 - b. Provide DSMS Systems Engineering with quarterly reports that compare the performance of the frequency and timing standards at DSN facilities with the National Institute of Standards and Technology (NIST).
9. Monitor trends in the functional requirement parameters of DSN systems and ensure they are within acceptable limits. If trends indicate impending degradation or loss of committed data or services to DSN customers, immediately notify Contractor and DSMS management.
10. Provide DSN system performance reports on a monthly basis, as specified for OPS004, Technical Reports, in the Contract Data Requirements List (CDRL).
11. Generate special system-performance analysis reports, to assist in resolving problems reported by DSN customers, as specified for OPS004 in the CDRL.

3.1.4.2 Performance Metrics Generation

Service performance metrics must be generated and analyzed regularly to monitor the performance of DSMS services, to ensure that data delivery is meeting commitments, and to detect trends in service quality. These metrics must provide sufficient information to both the Contractor and DSMS Operations Management so that informed decisions can be made concerning where problems exist in the service execution (SVE) process, and possible mitigation actions can be determined. The metrics will also be used to periodically report on the overall state of the DSMS to Interplanetary Network Directorate (IND) management.

In addition, the metrics are used to evaluate the effectiveness of process improvement initiatives and the performance of new or upgraded capabilities. The data required to generate these performance metrics are currently obtained from the DRMS, as described in SOP 842-50-31, *Standard Use of the Discrepancy Reporting System*, and the DSN scheduling history database. The scheduling history database is maintained on the NSS.

The DRMS provides information on failures of DSMS services and includes such information as:

- The customer that was being supported
- The antenna that was used

- The suspected cause of the problem
- The suspected equipment involved in the failure
- The data types lost or degraded during the failure, a general description of the circumstances surrounding the failure
- Additional ancillary information

The scheduling history database provides

- The scheduled support times
- Customer, antenna, service configuration, scheduling work category codes
- Setup and teardown times for all supports that are conducted on the DSN

Either or both of these databases will be used to generate weekly, monthly, and ad hoc performance metrics. Ad hoc metrics are required to analyze performance for a particular customer, to determine if commensurate performance quality is being provided compared to other customers and for special studies. Most of the performance metrics will be generated and archived in graphical form (such as run charts, pie charts, and bar charts).

In support of this task, the Contractor shall:

1. Generate and distribute to DSMS Operations Management, weekly and monthly scheduling metrics on the use of network assets by work category code, as specified for OPS003, Network and Services Utilization Data, in the CDRL.
2. Generate and distribute to DSMS Operations Management, weekly and monthly service performance metrics, as specified for MO21, Performance Metrics, in the CDRL.
3. Maintain archives of performance metrics for historical trend analysis and special studies.
4. Staff the performance analysis task with knowledge of basic DSN architecture and operations, statistical methods, data collection, manipulation, and analysis, and trend identification.
5. Provide interpretation summaries of any favorable or adverse trends in the performance of DSN systems.

3.1.5 NETWORK ACTIVITIES PLANNING AND SCHEDULING

3.1.5.1 Resource Analysis Team

Resource allocation planning (RAP) is the process of negotiating support requirements among multiple project users of DSN to fit the committed service into the available resources. The Contractor will support the Resource Allocation Planning and Scheduling Office's (RAPSO).

The JPL-led Resource Analysis Team (RAT) is responsible for forecasting and planning the use of DSN assets. In addition to understanding the engineering aspects of allocated DSN resources, the team performing the RAT task will need an understanding and appreciation of science aspects of the remote sensing being supported and different mission phases and activities supporting the remote sensing spacecraft. The RAT will evaluate user requirements contained in DMRs and other documents to determine expected time available for each user and periods of high contention with other users. The RAT will also conduct "what-if" studies to answer scheduling questions.

Monthly joint user-resource-allocation planning (JURAP) meetings will be held to discuss and resolve outstanding issues. The RAT will prepare materials for these meetings, including recommendations to resolve contentions. Additionally, the RAT will prepare preliminary weekly allocations that are reviewed and discussed at periodic negotiation meetings. Include representatives from each DSN user organization, these negotiation meetings will resolve resource contentions for the next 2 to 12 months.

In addition, the RAT will maintain interfaces with JPL's Mission Data Acquisition Planning (MDAP) team and various other NASA and international flight project schedulers, as required.

A semi-annual Resource Allocation Review Board (RARB) meeting will be held, providing an opportunity for users to present new or modified requirements for antenna support that are upcoming in the next two or three years. The RAT will prepare and present recommendations at this meeting, to help resolve asset contention among users, for the next three years.

The Contractor will publish a long-range plan to forecast future conflicts and overall network loading. Planning schedules for major DSN upgrades will depend on this forecasting capability.

For the load forecasting and scheduling software, the Contractor will:

- Report and track anomalies
- Manage change requests
- Report discrepancies
- Develop procedures
- Manage the documentation
- Interface with JPL software developers

The Contractor will provide the resource analysis support to develop, process, maintain, analyze, report, and publish plans, reports, recommendations, studies, and schedules relating to DSN resource allocation, contentions, and antenna loadings.

JPL will support the Contractor by:

1. Providing regular technical direction.

2. Providing access to JPL's proprietary resource-planning software, associated computer equipment, and the services it deems necessary.
3. Reviewing documentation provided by the Contractor.
4. Providing access to the following, as appropriate:
 - a. User requirements
 - b. View-period data
 - c. Facility implementation, capabilities, guidelines, and constraints

In support of resource allocation, the Contractor shall:

1. Determine antenna availability and capability based on inputs from DSN System Engineering and Implementation.
2. Schedule DSN upgrades during quiescent tracking periods to minimize effects on project users, and identify scheduling conflicts between major projects early on.
3. Provide an eight-week block of conflict-free plans and transfer them to the Network Activities Planning and Scheduling personnel for operational scheduling.
4. Perform analyses and special studies to assess the feasibility of planning options.
5. Support periodic meetings to resolve conflicts and to allocate resources in the most efficient manner.
6. Interact with science and scheduling teams to fully understand, process, and follow data-acquisition plans, requirements, and requests, and determine the optimal times for antenna maintenance and calibration.
7. Generate status reports indicating actual progress versus planned.
8. Develop the DSN loading factors and use requirements for planning future allocations.
9. Publish the quarterly DSN forecast report that shows the long-range DSN loading plans in support of flight projects, radio science/advanced systems research, and special project support.
10. Maintain a current file of station downtime periods and latest project launch dates.
11. Publish a semi-annual report that delineates the latest flight project major milestones, station upgrades dates, and test and training dates.

12. Provide narrative interpretation of historical data analyses to aid in long-range planning.
13. Prepare and deliver special reports as required.
14. Support creation of the long-range plan (forecast). The plan shall cover a period of 10 or more years and shall:
 - a. Forecast for allocation of existing and planned network resources.
 - b. Identify user requirements for each week.
 - c. Estimate periods of high contention for the DSN and users and users' lost times.
 - d. Provide information on antenna subnet capacity and loading.
 - e. Provide forecasts and data to help develop long-range strategies for:
 - i. Early resolution of resource conflicts
 - ii. Network design, implementation, and upgrades
 - iii. Mission proposals and design
 - iv. Spacecraft design
 - v. Mission-event timing and priorities
15. Support the development of the mid- and short-range plans that include:
 - a. User requirements
 - b. RARB decisions
 - c. RAP agreements
 - d. Station view periods
16. Update the mid-range database and prepare the mid-range plan.
17. Support the RARB, include providing:
 - a. Forecasts of high-contention periods upcoming in the next two or three years
 - b. Recommendations to resolve or minimize contention
 - c. General recommendations for subsequent years
 - d. The RARB Red Book (two weeks before the RARB)
 - e. Action item lists and minutes
18. Evaluate mission requirements for their effects on DSN asset loading.

19. Perform special studies, including:
 - a. Updating requirements, major events, and resource availability databases
 - b. Acquiring antenna view periods and updating the view-period database
 - c. Performing analyses
 - d. Preparing and publishing results
20. Participate in the monthly DSCC implementation-downtime meetings.
21. Chair the weekly midrange conflict resolution and negotiation meeting.

3.1.5.2 Network Activities Planning and Scheduling

Because demand exceeds supply and all commitments are closely negotiated, DSN tracking resources must be scheduled effectively.

Resource allocation, mid-range schedules, and guidelines are necessary for specifying station staffing hours and the percentage of station time to be dedicated to activities such as the specific times for antenna maintenance, radio astronomy, spacecraft tracking, and the various user priorities.

RAPSO mid-range scheduling will provide to the DSN conflict-free, eight-week planning schedules.

3.1.5.2.1 SHORT-TERM SCHEDULING

The Contractor will maintain and update the eight-week planning schedule. Each issue of the schedule must accurately document all negotiated user requests and adhere to all guidelines and constraints.

3.1.5.2.2 NON-REAL-TIME SCHEDULING

In non-real-time scheduling, the Contractor will generate and distribute the seven-day, combined schedule that is conflict-free.

In support of DSN scheduling, the Contractor will also participate in the JPL RAPSO conflict resolution meetings. These meetings will provide the instructions, coordination, and action required for the publication and distribution of all schedules, in accordance with publication deadlines.

3.1.5.2.3 REAL-TIME SCHEDULING

When events dictate, network operations will make real-time changes to the seven-day schedule. In non-real-time, the Contractor will update DSN the seven-day schedule to reflect the real-time changes.

3.1.5.2.4 ANALYSIS AND SUPPORT

The Contractor will use software tools and techniques to effectively schedule DSN assets.

In support of this task, JPL will:

1. Provide technical direction.
2. Provide technical guidelines.
3. Review documentation provided by the Contractor.
4. Provide access to the following, as appropriate:
 - a. Project tracking requirements.
 - b. View-period data.
 - c. Mid-range scheduling data.
 - d. RAPSO meetings and/or negotiation meetings.
5. Provide DSN resource-allocation scheduling guidelines.

3.1.5.2.5 REQUIREMENTS

In support of this task, the Contractor shall:

1. Schedule DSN resources based upon resource allocation, mid-range schedules, and guidelines set forth and provided by NASA, JPL, and DSN management; present the resulting DSN Schedule in an accurate and timely manner, using computerized scheduling techniques that maximize DSN use and productivity.
2. Review and generate special investigative reports and management information reports, as required by JPL and NASA, concerning availability and use of the DSN tracking resources.
3. Coordinate publication of the monthly priority guideline and the DSN Scheduling Code Dictionary.
4. Participate in RAPSO RARB meetings and DSN project scheduling meetings.
5. Identify conflicts resulting from change requests to the seven-day schedule.
6. Advise projects, as necessary, of conflicts in the seven-day schedule that need to be resolved.
7. Participate in midrange conflict-resolution and negotiation meetings.

8. Generate, validate, and publish (distribute) seven-day operations schedules and 8-week planning schedules in accordance with JPL Document 841-001, *Standard Operations Plan for the Deep Space Network*.
9. Coordinate scheduling with RAPSO of non-DSN facilities during mutual support periods and as agreed to in the DMR documents and interface control documents.
10. Update and maintain scheduling databases.
11. Provide emergency scheduling support, as required.
12. Coordinate with JPL Operations Chief to send updated schedules to DSN complexes.
13. Prepare and maintain contingency plans for launch slips (24-hour and 48-hour slips), as required.
14. Provide various interim schedules that may be necessary to develop the final schedules.
15. Maintain a historical database, consisting of scheduled events and actual use by users, and provide DSN utilization reports as specified for OPS003, Network and Services Utilization Data, in the CDRL.
16. Provide special reports and studies on past or future DSN utilization, when requested by the RAPSO.
17. Provide monthly inputs to the RAPSO on activities for the JPL Program Management Review.

This task has a special requirement:

1. Because of the specialized nature of this work, JPL will provide technical direction through the DSMS Resource Allocation Planning and Support Office.

3.1.6 MISSION-SPECIFIC PLANNING AND PREPARATION

The Contractor will support all JPL and non-JPL projects committed to by the DSMS, including:

- Spacecraft in deep space
- Spacecraft in high Earth orbits (HEOs)
- Spacecraft in low Earth orbits (LEOs)
- An emergency support set of spacecraft
- The Radio Astronomy and Special Activities (RASA) Program.

The complexity of DSMS support for the various flight projects requires that the DSMS accomplish both timely and detailed planning of operational support. The

planning has a broad scope, since it must accommodate each flight project's unique support requirements, unique spacecraft characteristics, unique POCC interfaces, the requirements of the RASA Program, and the capabilities and interfaces of the DSMS Facilities.

The Contractor will provide documents that have general information on the DSMS facilities, characteristics, capabilities, interfaces with the flight projects, RASA, ground communications, and DSMS support personnel. These mission-specific documents include:

- Test plans
- Training plans
- Operations procedures
- Critical event plans
- Hardware configurations

To develop these documents, the Contractor will interact with flight project planners. Early interaction with the flight projects ensures that:

- Spacecraft and POCC interfaces with the DSMS are correctly established
- Flight-project-unique support requirements can be accommodated by the DSMS and are correctly planned for early in the mission-planning phase

The Contractor will disseminate these documents throughout the DSMS, allowing enough time for them to be reviewed, studied, implemented, and for test and training to be conducted.

The Contractor will adhere to the document management plan, to control documents and changes to documents.

Because of the complexity of operations and the planning and preparation that must be coordinated, the Contractor will use a checklist to ensure that no activity is overlooked.

Once preparations for a mission or mission critical event are complete, the Contractor will assess DSMS readiness and reports the state of readiness to DSMS management, during the Mission Events Readiness Reviews (MERRs).

The Contractor will generate and distribute a network operations plan (NOP) for each flight project. To the extent possible, configurations and procedures will be mission independent. Planning tasks include:

- Participating in project planning activities as a member of DSMS and project-interface planning teams
- Monitoring DSMS development activities, to ensure that technical capabilities are consistent with project support requirements
- Testing project interfaces
- Managing and executing all required DSMS training
- Ensuring that critical-event planning is adequate

- Generating the overall operations-readiness milestone schedule and monitoring progress against milestones, to ensure that DSN Operations is ready to support the project
- Planning the GCS support configurations for the projects

In support of this task, the Contractor shall:

1. For each mission, generate a mission-specific NOP and update according to changes in operations procedures, mission configurations, or special events.
2. For each critical event supported by the DSN, prepare critical event plans, as specified in the CDRL for OPS002, *Network Operations Plan*, based on detailed system knowledge, telecommunications link analysis, and mission-event-profile evaluation.
3. Present the critical event plans in formal DSMS MERRs.
4. Plan operations for all flight projects supported by the DSMS, including all prelaunch preparations and all required in-flight support, for the duration of the DSMS commitment.
5. Support the JPL Telecommunications and Mission System (TMS) managers in the DSMS Plans and Commitments Office.
6. Assess and ensure the operational readiness of the DSMS, for both routine activities and mission-critical events.
7. Coordinate all activities involving major operational elements of the DSMS, including the DSOCC, AMMOS, DTF, GDSCC, CDSCC, MDSCC, ROSA, MIL-71, flight project interfaces, and other non-DSN supporting elements. This coordination includes testing and training, participating in mission operations planning meetings, and reporting readiness to support.
8. Monitor all DSMS development to ensure that design, schedules, and technical capabilities are consistent with DSN operations requirements and flight-project support requirements.
9. Develop and provide the DSMS Operations Program Office and TMS Managers with DSMS operations milestone schedules for all aspects of prelaunch mission preparation, launch, routine in-flight support, and in-flight mission-critical event planning and support.
10. Plan, conduct, evaluate, and report on all activities required to ensure mission support readiness, in accordance with JPL Document 841-001, *DSN Standard Operations Plan*.
11. Present operational plans and readiness status in formal DSMS MERRs, as specified in the CDRL for OPS001, *Mission Event Readiness Review Materials*.

12. Evaluate mission-specific operational performance of the DSMS, using quantitative metrics whenever possible, and provide periodic oral and written reports to DSMS Operations Program Office Management and TMS Managers.
13. Provide for GCS planning to coordinate and establish data- and voice-communication circuits, interface protocols, and communications terminations as appropriate, to support each mission's prelaunch testing, launch, and in-flight activities.
14. Establish modified configuration control (MCC) during critical mission activities to ensure that no changes are made to the network that would impair its ability to support.
15. Attend operations working groups and technical interchange meetings at the GDSCC, Pasadena, the overseas complexes, and international space agencies.

3.1.7 MISSION-INDEPENDENT PRODUCTS AND PROCEDURES (SOPs)

The network operations, Pasadena support personnel, and DSCC operations personnel use system-level procedures to prepare for or directly support tracking operations. These mission-independent procedures are contained in the 84X series of DSMS standard operating procedures (SOPs).

In support of this task, the Contractor shall:

1. Generate and verify SOPs for the network operations, support personnel, and DSCC link controllers.
2. Revise SOPs as appropriate for engineering changes, upgrades, or the addition of new capabilities.
3. Disseminate SOPs.

3.2 NETWORK SUPPORT SERVICES

The network support services task provides infrastructure for the operation, maintenance, and development of the network. This infrastructure includes:

- Providing a test facility for spacecraft interface and DSN product testing
- Providing configuration management and accountability for all changes made to the network
- Providing online tools for gathering and reporting on network performance
- Producing and distributing network documentation and repairing/replenishing network spares
- Shipping products to and from network facilities

These services are performed in support of all elements of the network, including the overseas DSCCs.

3.2.1 DEVELOPMENT AND TEST SERVICES

The DSN development and test services comprise:

- Verifying the compatibility of spacecraft telecommunications components with the DSN, throughout spacecraft development. This verification will usually be performed at the DTF-21 facility. The MIL-71 facility will provide final prelaunch compatibility verification.
- Verifying data flow interfaces for flight projects.
- Verifying end-to-end system compatibility between the DSN and flight projects. These tests may involve spacecraft at the JPL Spacecraft Assembly Facility (SAF) or at remote contractor or government sites. In some cases, the CTT-22 compatibility test trailer will provide remote site support.
- Providing a system-level test environment for product development and acceptance testing.

The three facilities associated with providing these services include:

- DTF-21 facility
- CTT-22 compatibility test trailer
- MIL-71 launch-support facility

The DTF-21 facility duplicates major portions of a DSCC and DSS, less the antenna, servocontrols, radio frequency (RF) amplifiers, and the front-end microwave components. This permits DTF-21 to be used as an engineering test bed for developing DSN subsystems. Its configuration will be controlled by the same ECM system that is used for the DSCCs. Equipment in the development phase will be brought into DTF-21 for integration testing with other subsystems. Although this equipment will not be under configuration control, the Contractor must provide mechanisms to ensure that any special test configurations are documented and that the baseline configuration can be readily restored.

The DTF-21 facility is at 505 W. Woodbury Road, Altadena, California. It comprises about 10,907 square feet for equipment, office space, and RF-compatibility testing. High-rate, fiber-optic, T1 communications links provide the primary connection for interchange of data from DTF-21 to JPL Building 171 and other project facilities. The communications links are leased from the City of Pasadena.

MIL-71 provides a prelaunch compatibility test configuration at the KSC in the period before the launch of the spacecraft. MIL-71 equipment is located in a single room within the Goddard Space Flight Center (GSFC)–Merritt Island Launch Area (MILA) host facility on Merritt Island. MIL-71 will be activated as required for launch support and it will be operated and maintained by the Contractor.

Whenever the facility is activated, Contractor personnel will verify that MIL-71 equipment is properly configured and operational. The Contractor will conduct end-to-end data flow tests. After launch, MIL-71 will be deactivated as scheduled.

CTT-22 is a transportable trailer that contains the telemetry, tracking, command, ground communications, and monitor/control subsystems that normally support 26-meter, 34-meter, or 70-meter tracking activities. The trailer's home base is at DTF-21; it will be moved to remote sites as scheduled.

The Contractor will operate DTF-21, CTT, and MIL-71 to support compatibility testing, development activities, and flight-project special activities. Once a compatibility test has been scheduled, the Contractor will operate all DTF-21 or CTT equipment involved in that particular test configuration and follow detailed test procedures. The Contractor will gather and record test data.

Development support will involve station personnel and development engineers. When integrating new equipment into the DTF-21 configuration, the Contractor must verify that this new equipment is compatible and will not damage existing DTF 21 equipment. Development engineers may operate this equipment for development purposes, but only under a set of guidelines provided by the Contractor.

The Contractor will operate the DTF-21 equipment in specified test configurations, to support flight-project special activities, such as data flow tests of ground data systems. In these tests, the DTF-21 usually will be emulating a DSN tracking station and will process/deliver spacecraft telemetry data for project analysis.

DTF-21, CTT-22, and MIL-71 support the testing of the compatibility of the RF and data systems between a flight project spacecraft and the DSN. The majority of the testing will be performed at DTF-21. Typically, different types of testing will be performed at different facilities:

- DTF 21: RF compatibility and end-to-end testing
- CTT-22: RF compatibility and end-to-end testing, at a project facility remote from JPL
- MIL-71: Final verification of RF compatibility and data flows before launch

The flight project will develop the compatibility test plan but may request Contractor assistance. The plan will define all tests to be conducted, parameters to be measured, and limits for those parameters. Since compatibility testing is conducted in phases, this test plan will also specify the configuration to be employed during each test phase. The spacecraft can be tested in its breadboard, preproduction, proof test model, or flight configurations.

The Contractor will prepare and control the compatibility test procedures. The test procedures must satisfy all requirements contained in the compatibility test plans, per DSMS 814-005, *DSN Flight Interface Compatibility Design Handbook*.

Compatibility testing typically requires several days to several weeks, depending on the spacecraft's complexity and development phase. Because access to the spacecraft will be limited, extended work hours may be required to complete compatibility test sessions. The Contractor may also have to assemble/generate

special hardware/software configurations to conduct compatibility tests. The Contractor will produce a detailed compatibility test report, which must be issued in a timely fashion, after testing is complete.

In support of this task, the Contractor shall:

1. Operate and maintain the DTF-21, CTT-22, and MIL-71 subsystems used for compatibility testing, hardware and software development, and flight-project systems testing.
2. Maintain the lease with the City of Pasadena for the communication links.
3. Maintain the lease on the Building 605 location.
4. Transport the CTT-22 to support scheduled tests. Transportation includes securing the required licenses, required permits, and transportation services.
5. Establish and maintain a process for scheduling the DTF facilities to maximize the utilization of the facilities, in support of compatibility tests and development users. The Contractor shall also publish a weekly schedule for users of the facilities.
6. Perform tests that verify the compatibility of the flight hardware with the DSN, in accordance with DSMS 814-005, *DSN Flight Interface Compatibility Design Handbook*. The Contractor shall publish a final compatibility test report, as specified in the CDRL for OPS005, *Compatibility Test Reports*.
7. Interface with TMS managers and flight project representatives to prepare compatibility test schedules, test plan documents, and detailed test procedures.
8. Plan and prepare appropriate test facilities to implement special hardware and software configurations required to support compatibility test activities.
9. Support required testing at JPL, remote spacecraft assembly facilities, or at spacecraft launch sites.
10. Conduct initial compatibility testing (RF tests) and verify compatibility at the launch site. Support end-to-end data flow tests for projects and publish a quick-look report immediately following each test sequence.
11. Control the configuration of transferred hardware and software. The Contractor shall provide procedures and controls for management of development hardware and software that co-resides in the DTF.
12. Assist engineering in implementation and corrective maintenance of non-transferred equipment.
13. Support the reproduction, analysis, and resolution of system-level DSN performance problems.

3.2.2 CHANGE MANAGEMENT TOOLS AND ADMINISTRATION

The DSMS operates in an environment of change. Changes are driven by the need to provide new mission-support capabilities and by internal needs to improve operability, maintainability, and safety.

The change management tools and administration task addresses an ECM process that conforms to DSMS configuration management standards and provides tools and procedures to implement those standards in the DSN. The current practice involves monthly meetings of a DSN change control board (CCB), at which proposed changes are reviewed, assessed, and approved. If a proposed change is approved, an engineering change order (ECO) and modification kit (modkit) must be prepared to make the actual product modifications in the field. Change management includes all activities associated with receiving, distributing, and tracking the modkits to their destination subsystems.

Change management also involves managing the executable software products used within the network. Starting with formal acceptance testing, software change management is provided by the software production, management, and control activity. This task will also provide electronic distribution of official software to DSN operational sites and the maintenance of a central library containing all programs and files necessary for software delivery and/or restoration.

In support of this task, the Contractor shall:

1. Administer the online 820-061 database, including weekly updates and change reports (JPL will provide the repository for the database).
2. Schedule and support the DSN CCB meetings, including preparing and publishing agendas and minutes.
3. Provide support services for the change request assessment and approval process, as defined in DSMS 813-023, *DSMS Configuration Management Procedures*.
4. Administer and provide tools for the DSN transfer agreement process, including electronic form access, lien database, maintenance support agreements, and system safety records. The process is defined in DSMS 813-125, *DSN Hardware Transfer & Delivery Procedures* and DSMS 813-126, *DSN Software Transfer & Delivery Procedures*.
5. Monitor and report the status of all ECO modkits, through completion of implementation, including the installation of modkits in each specific instance of DSN equipment.
6. Assign program identifiers to all custom and third-party software (TPS) used within the DSN.

7. Provide a program library of executable software and associated files for all custom and TPS software used within the DSN.
8. Provide a redundant program library outside of the Los Angeles basin, for use in disaster recovery.
9. Provide copies of official software products to the network, for acceptance testing and operation, and ensure the ability to restore a previously delivered software configuration.
10. Operate the DSN online software library that has components at the central site and at each DSCC and that can electronically deliver software products to each site.
11. Provide all status and accountability data/metrics via Web-based reports accessible to all DSMS personnel.
12. Support and plan for improvements to the ECM process and provide associated updates/modernization of supporting tools.

3.2.3 NETWORK DOCUMENTATION

The network documentation task will provide official DSMS documentation to DSMS users. The official electronic repository for DSMS documents will be at JPL. The Contractor will control documents and changes to documents. The Contractor will enter documents into that repository, remove obsolete documents, and ensure the quality of any ancillary data that is entered into the official document files. After official release by the Contractor, the Contractor will make the documents electronically available to appropriate users. Other document support functions will include:

- Providing standard templates to document owners and preparers
- Providing formatting support for specific DSN document series
- Providing tools and techniques for facilitating document review and approval procedures.

In support of this task, the Contractor shall:

1. Release all DSMS 800-series documents in accordance with DSMS 813-021, *DSMS Document Process Procedures*, except for DSN documents DSMS 820-013, *DSMS External Interface Specifications*; DSMS 820-016, *DSMS Subsystem Software Interfaces*; DSMS 820-017, *DSMS Detailed Hardware Interfaces*; and DSMS 820-019, *DSMS Interface Design Standards*.
 - a. Verify that documents are managed according to DSMS 810-001, *DSMS Documentation Structure, Standards, and Definitions*, to control documents and changes to documents.
 - b. Verify that all format requirements of DSMS 810-001 have been met.

- c. Provide release notifications to personnel on document distribution lists.
 - d. Provide hardcopy distribution only if specifically indicated.
2. Assign numbers to all 800-series documents.
 3. Provide document templates for general DSMS documents and for those documents that have internal content standards.
 4. Support the approval/review process.
 5. Plan for and implement an online review/approval capability for all DSMS documents.
 6. Remove obsolete documents from the official repository, and notify appropriate users in the DSMS community. The Contractor shall support activities to identify legacy documents that should be obsolesced.
 7. Maintain a central hardcopy library of all official DSMS documents.
 8. Administer and operate the DSMS Product Distribution System (DPDS), which provides for the electronic distribution of released DSMS user documents to the user sites. (DPDS will be provided and sustained by JPL.).
 9. Provide minor formatting of DSN software operation manuals and release description documents.
 10. Help document DSN network operations plans and SOPs.
 11. Produce metrics that are key indicators of documentation activities.
 12. Provide all status and accountability data/metrics via Web-based reports accessible to all DSMS personnel.
 13. Support and plan for improvements to the DSMS documentation process and provide associated updates/modernization of supporting tools.

3.2.4 NETWORK MAINTENANCE SUPPORT

To ensure that the DSN will meet its project support commitments, all equipment must perform within specification. As a diverse and continual activity, DSN maintenance must be both technically appropriate and cost effective. To accomplish this requirement, the Contractor will establish an equipment maintenance program to determine the technical skills, test equipment, test fixtures, and vendor repair services required to maintain DSN equipment.

In support of this task, the Contractor shall:

1. Develop the DSN Equipment Maintenance Program. This program shall identify test and maintenance equipment standards, specialized maintenance fixtures, the skill sets for maintenance personnel, and the scope of vendor maintenance support.
2. Conduct an annual review to verify the integrity and cost effectiveness of the DSN maintenance support capabilities, and recommended changes in an annual report on the Equipment Maintenance Program.
3. Evaluate new equipment and major modifications planned for implementation in the DSN to determine whether the resources and skills exist within the DSN to maintain, repair, test, and calibrate DSN equipment.
4. Every fiscal year, review, assess, and report to the program office the network maintenance capabilities, including the maintenance equipment status and documentation, maintenance training, commercial test equipment, and inventories of operational spares.
5. Support the DSMS Operations Program Office in test equipment procurement and support, spares procurement and support, maintenance training, and the generation of maintenance procedures, in accordance with DSMS 814-007, *DSN Maintenance Program*.
6. Evaluate the relative merits and costs of performing maintenance at the DSCCs, at a centralized Complex Maintenance Facility (CMF) level or by vendor contract, and based on this evaluation, recommend future maintenance locations. Identify any proprietary equipment considerations that mandate the use of vendor maintenance.
7. Secure Vendor repair of applicable DSN equipment items at all DSCC and Pasadena.
8. Within one working day, acknowledge requests from DSN facilities for equipment spares, test equipment, and other supplies needed to sustain operations and maintenance activities.
9. Provide for the storage of the equipment and materials required to support the various DSN facilities, and for the inventory control of these items.

3.2.5 LOGISTICAL SERVICES

The DLF is the focal point for moving and controlling the materials and equipment required to operate and maintain the three DSN complexes and other DSN facilities. The Contractor will use JPL Shipping & Receiving to ship to the overseas complexes. The Contractor will use the JPL export license to export of International Traffic in Arms Regulations (ITAR)-controlled materials. The DLF will continue to be located in a Contractor-leased facility. Contractor responsibilities will include:

- Shipping and receiving materials, some classified as hazardous materials (HAZMAT)
- Warehousing materials and spare equipment
- Transporting materials and equipment to and from vendors, the DSCCs, and JPL
- Packaging shipments—ranging from pounds to tons—to the three DSN tracking complexes
- Staging equipment modification kits
- Providing cataloging, serialization control, equipment identification, and research services for all items introduced into the DSN.

In support of this task, the Contractor shall:

1. Provide and operate the DLF.
 - a. The DLF shall be located within a 12-mile radius of JPL.
 - b. The DLF shall provide sufficient area to store all DSN network spares.
 - c. The DLF shall be the staging area for ECO modkits and MESkits.
2. Package and ship materials, including documents, spare parts, piece parts, large mechanical devices, DSN racks containing sensitive electronic equipment, magnetic tapes, and software media. Some of these materials are classified as HAZMAT.
 - a. To overseas DSCCs and other sites, as specified by the DSMS program office, through JPL Shipping.
 - b. Directly to GDSCC, CTT-22, DTF-21, and MIL-71.
3. Receive materials shipped from other DSN facilities and distribute these materials to appropriate addressees.
4. Consolidate weekly shipments to various DSN facilities, when possible, and provide for priority shipments to these same facilities.
5. Establish proper procedures and forms necessary to document shipments of material and equipment between Contractor-managed facilities.
6. Use JPL shipping memoranda to record all shipments between Contractor's Southern California facilities and JPL.
7. Send a copy of each shipping document to JPL Property and to JPL Shipping.
8. Establish and maintain a historical file of all shipping and receiving documents.

9. Provide adequate warehousing for material and equipment to support the operations of Contractor-operated facilities (CTT-22, DTF-21, MIL-71, and the NOCC) and DSCCs.
10. Properly store network spares at the DLF except for structural and mechanical spares that are too large to be stored other than in an outdoor secured storage area. The Contractor shall securely store these excepted items at GDSCC.
11. Provide an automated inventory control system to track and account for all items entering, being processed, and leaving the DLF.
12. Perform an annual property audit of items held at the DLF.
13. Operate regularly scheduled delivery service at the Contractor's discretion to meet network delivery requirements between the DLF and JPL, and between the DLF, GDSCC, and Contractor-operated facilities.
14. Develop techniques, processes, and procedures necessary to package DSN material and equipment to meet all expected environments, considering special requirements for air and sea freight, foreign country packaging requirements (Australia and Spain), and outside storage.
15. Implement a system for staging the completed modification kits at the DLF. When inventory of each modification kit (quantity of materials and documentation) has been certified by JPL Quality Assurance representatives, the Contractor shall send it to the packaging group for eventual shipment to designated destinations.
16. Establish and develop a database that shows the status of each modkit shipped.
17. Provide cataloging, serialization control, equipment identification, and research services for all items introduced into the DSN

The task has the following special provision:

1. Packaging personnel shall be certified, as required, especially for the handling and packaging of hazardous materials.

4 NETWORK ENGINEERING

The Contractor will support the constant technological evolution of the Deep Space Network (DSN), by implementing new information technologies, adding new capabilities in support of DSN commitments, and improving Deep Space Mission System (DSMS) system and subsystem performance. In the Network Engineering task, the Contractor will:

- Provides the support required for transferring new capabilities from DSMS Engineering (provided by JPL) to all Deep Space Communication Complexes (DSCCs)
- Performs the analysis required to troubleshoot problems and to help DSMS Engineering determine implementation thrusts
- Provides technical expertise in all areas of DSN systems

4.1 DSN ENGINEERING

In support of the DSN Engineering task, the Contractor shall:

1. Provide technical support to DSN facilities at both system and subsystem levels, in accordance with DSMS 820-061, *DSMS Subsystem, Configuration Item, and Responsibility Definitions*. The areas of Contractor responsibilities shall include:
 - a. Antenna and mechanical structures
 - b. Antenna drive systems, bearings, and gearboxes
 - c. Antenna pointing subsystem
 - d. Power generation and distribution equipment
 - e. Building structures, roofing systems, lighting, and heating and cooling systems
 - f. Fire protection and fire detection systems
 - g. Roads, water, and sanitary systems
 - h. Fuel storage and distribution systems
 - i. Data processing subsystems
 - j. Radio frequency (RF) receiving and transmitting subsystems
 - k. Ground communications subsystems
 - l. Subsystem interface equipment and cabling

- m. Frequency and timing subsystem
- 2. Maintain technical cognizance of end-to-end system configurations, performance parameters, and capabilities.
- 3. Liaise between personnel at the DSCCs and DSMS Engineering for the resolution of operational problems, failures, and discrepancies.
- 4. Participate in the development and review of operations concepts and requirements.
- 5. Participate in all implementation task reviews, as specified in JPL document DSMS 813-101, *Guideline for SCD Reviews*:
 - a. Preliminary Definition and Cost Review (PDCR)
 - b. Preliminary Design Review (PDR)
 - c. Detailed technical reviews (DTRs)
 - d. Peer reviews
 - e. Critical Design Review (CDR)
- 6. Participate in implementation tasks—from task inception through the operational phase—as requested by DSMS Engineering.
- 7. Develop and maintain a uniform and consistent spares philosophy, for new implementation and upgrades to the system.
- 8. Negotiate spares inventory with each implementation task according to the spares philosophy for the implementation of equipment into the DSN.
- 9. Negotiate for special test equipment required by operations to properly service, measure, and maintain the systems and subsystems.
- 10. Develop and disseminate information or procedures to the DSN facilities to prevent, avoid, or work around operations and maintenance problems affecting the quantity and quality of data services to the users of the DSN.
- 11. Review hardware and software anomaly reports (ARs) with Cognizant Development Engineers (CDEs) and coordinate with DSN personnel the preparation of engineering change requests (ECRs) for submission to the DSN Engineering Change Management (ECM) system.
- 12. Report to and update the CM database by updating the installation, test, and operational status of ECO implementations.

13. Develop, document, and provide DSMS operation test plans (OTPs) for DSN data systems.
14. Participate in the development of all subsystem acceptance testing (AT) documents and operations and maintenance manuals (OMMs).
15. Review and comment on user documents per DSMS 810-001, *DSMS Documentation Structure, Standards, and Definitions*, before their release.
16. Support Test Engineering and Mission Services Engineering in the development, review, and conduct of hardware and software acceptance tests, system performance tests (SPTs), project interface tests (PITs), and demonstration tests.
17. Identify, analyze, and document functional and performance anomalies during the implementation and operational phases and prioritize them for resolution by DSMS Engineering.
18. Facilitate the acceptance and transfer of DSN modification kits for implementation into the DSN.
19. Ensure that all DSN data systems conform to and meet NASA–JPL Information Technology Security guidelines and procedures, as cited in Section 1.1.7.
20. Develop and document operational processes and procedures.
21. Participate in the DSN sustaining engineering process.
22. Recommend design improvements, redesign, upgrades, enhancements, and streamlining of DSN operational data systems.
23. Provide real-time engineering technical support for critical and high-profile DSN activity events as defined DSMS 841-001, *DSN Standard Operating Procedure*.
24. Coordinate with the DSMS Operations Program Office the acceptance of a capability.
25. Travel to the complexes and vendor sites, for implementation, training, and test support.
26. Review all maintenance records, predictive/preventive reports, and inspection reports submitted by the stations and compile a monthly report on the findings listing any concerns. Include this report in a monthly maintenance report package, as described in the CDRL in OPS 004, Technical Reports.
 - a. Deliver this report to the DSN Antenna Maintenance Specialist and the DSMS Facilities and Logistics Office Manager.

27. Monitor the status of spares at each DSCC and their availability, and generate a quarterly report: the Spare Status Report, as described in OPS 004 in the CDRL.
 - a. Deliver this report to the DSN Antenna Maintenance Specialist and the DSMS Facilities and Logistics Office Manager.
28. Identify systemic operational problems by monitoring and analyzing discrepancy reports, and report the findings to DSMS Engineering.

4.1.1 FACILITIES IMPLEMENTATION PLANNING

Facilities Implementation Planning provides control of the DSN facilities floor and wall space, an interface between the DSMS Engineering tasks and the DSN facilities, and support of the task through procurement of racks and system cables.

This work area is part of the Service Capability Development process (in Appendix G, Service Capabilities Development Process).

In support of this task, the Contractor shall:

1. Coordinate with the DSMS Engineering task personnel, to document subsystem interface equipment and cabling.
2. Prepare and publish facility implementation plans (FIPs), as required by the engineering task manager, for hardware implementation tasks.
3. Work with the DSN facilities personnel to determine the implementation resource requirements.
4. Prepare and release facility floor-plan drawings using JPL-compatible CAD tools, as defined in DSMS 813-203, *DSN Drawing Format and Content Standards: Vol. 1, Equipment*, of equipment layouts for all DSN facilities and antennas.
5. Release documents and drawings in DSMS and JPL document control systems, as defined in DSMS 813-021, *TMOD DSMS Document Process Procedures*, and 813-022, *DSMS Drawing Process and Procedures*.
6. Provide engineering services to design, define, catalog, and produce system cables and interconnections for intersubsystem and interassembly cables.
7. Provide fabrication services to refurbish or manufacture and maintain an inventory of standard DSN racks, and associated accessories, as defined in DSMS 813-202, *Design Requirements for Deep Space Network Equipment*.
8. Provide general DSN Engineering support, as described in Section 4.1, DSN Engineering, as appropriate.

4.1.2 ANTENNA-MECHANICAL NETWORK ENGINEERING

The Contractor will provide technical support for the antenna structural, mechanical, and Cassegrain assemblies, and for special tooling and instrumentation. This technical support involves the analysis, design, and implementation of new procedures and processes to resolve antenna problems and to improve antenna operational reliability. The Contractor will be responsible for all activities required to ensure the continued operation of the antennas, including development of recovery plans, rigging techniques, and special tooling to minimize antenna outages. The Contractor will develop new procedures or upgrade present ones to support operational and maintenance activities for the structural, mechanical, and Cassegrain assemblies, and for the special tooling and instrumentation. The Contractor will review annually all records for DSN antennas:

- Maintenance records
- Hydrostatic bearing shimming and profile records
- Radial bearing alignment records
- Elevation and azimuth drive alignment records
- Structural inspection reports
- Oil analysis, vibration analysis, acoustic analysis, and infrared analysis reports
- Antenna spares records
- Maintenance records for antenna support equipment

4.1.2.1 Structural Engineering

In support of the Structural Engineering task, the Contractor shall:

1. Conform to the rules and regulations of the national standards for structural assemblies, materials, and welding codes.
2. Evaluate the condition of the structural assemblies on the antenna and develop all rework/repair operations for its components.
3. Monitor maintenance activities and the installation of all additions to the structural assembly.
4. Review the analysis data and design drawings developed by the design-Engineering group for any proposed modifications to the structural assembly.
5. Develop the lift plans for the removal or installation of new members.
6. Provide general DSN Engineering support as described in Section 4.1, DSN Engineering, as it applies to antenna-structural systems engineering

4.1.2.2 Mechanical Engineering

In support of the Mechanical Engineering task, the Contractor shall:

1. Conform to the rules and regulations of the national standards for mechanical assemblies and their design.
2. Evaluate the condition of the mechanical assemblies on the antenna, including the alignments of the gear reducers, condition of the hydraulic and electric drives, condition of all rotating assemblies, and the operational status of the hydrostatic bearing assembly.
3. Develop all installation, rework, and alignment procedures for the maintenance activities on all mechanical assemblies.
4. Review the analysis data and design drawings developed by the design engineering group for any proposed modifications to the mechanical assembly.
5. Monitor the condition of the hardware by analyzing the predictive and preventive maintenance reports generated by the maintenance personnel at the stations.
6. Be responsible for keeping track of the availability of replacement hardware.
7. Provide general DSN Engineering support as described in Section 4.1, DSN Engineering, as it applies to antenna-mechanical systems engineering.

4.1.2.3 Cassegrain Assembly

In support of the Cassegrain Assembly task, the Contractor shall:

1. Conform to the rules and regulations of the national standards for Cassegrain assemblies and their design, materials, and coatings.
2. Develop new procedures used for maintenance activities for the handling and alignments of the reflective structure, subreflector assembly, and mirrors.
3. Analyze antenna performance reports and determine the condition of the Cassegrain assembly.
4. Review the analysis data and design drawings developed by the design-Engineering group for any proposed modifications to the Cassegrain assembly.
5. Monitor the condition of the hardware by analyzing the predictive and preventive maintenance reports generated by the maintenance personnel at the stations.
6. Provide general DSN Engineering support as described in Section 4.1, DSN Engineering, as it applies to the Cassegrain assembly.

4.1.2.4 Special Tooling and Instrumentation

In support of the Special Tooling and Instrumentation task, the Contractor shall:

1. Design any mechanical equipment needed for the repair, replacement, and alignment of antenna hardware.
2. Monitor the condition of the hydrostatic bearing instrumentation (HBI).
3. Develop any instrumentation that could be used for maintenance activities and monitoring of antenna components.
4. Review the maintenance report for the shimming activities on the 70-m antenna hydrostatic bearing. Generate a report on the condition of the runner and include it in the monthly maintenance report package described in OPS 004 in the CDRL.
 - a. Deliver this report to the DSN Antenna Maintenance Specialist.
5. Provide general DSN Engineering support as described in Section 4.1, DSN Engineering, as appropriate.

4.1.3 MICROWAVE NETWORK ENGINEERING

Microwave Network Engineering supports the Transmitter (TXR) and Microwave (UWV) subsystems. The TXR amplifies the modulated signals to be radiated. The UWV polarizes uplink and downlink signals, amplifies downlink RF energy to telemetry receivers, and transmits uplink signals to the antenna. The Microwave Network Engineering task includes the support, sustenance, and maintenance of the UWV and TXR subsystems, as delivered by DSMS Engineering.

In support of this task, the Contractor shall:

1. Monitor, measure, and analyze the functions and performance.
2. Identify, troubleshoot, and resolve discrepancies, failures, and problems.
3. Measure each antenna's configuration and RF performance at least every six months, or as maintenance, implementations, or failures dictate.
4. Submit a performance report monthly, as described in the CDRL for OPS 004.
5. Participate in the DSMS Engineering System Design Team, to represent operations, implementation, and maintenance interests.
6. Recommend improvements.
7. Survey, inspect, and verify operational equipment and R&D or host-country equipment interfaces at each complex annually, or as required to ensure the common configuration and uniform designs between subnets and complexes.

8. Provide general DSN Engineering support as described in Section 4.1, DSN Engineering, as appropriate.

4.1.4 DATA-PROCESSING-SUBSYSTEMS NETWORK ENGINEERING

The Data-Processing-Subsystems Network Engineering task includes engineering technical support for the data systems at all DSN sites:

- Telemetry
- Command
- Monitor and control
- Tracking
- VLBI
- Radio science
- Radio astronomy
- Test support

This technical support consists of operational performance and process analysis and ensuring that operational data systems can support DSN activities.

In support of this task, the Contractor shall:

1. Ensure that the data processing subsystems adhere to DSMS operability standards as documented in JPL DSMS 820-019, *DSMS Interface Design Standard*.
2. Provide status reports of all data processing subsystems to the DSMS Engineering and Operations Program Offices:
 - a. A weekly status report of significant events on the operational performance.
 - b. A detailed, monthly status report of operational performance and trend analysis.
3. Provide general DSN Engineering support as described in Section 4.1, DSN Engineering, as appropriate.

4.1.5 COMMUNICATIONS SYSTEM NETWORK ENGINEERING

The Communications System Network Engineering task provides engineering technical support of the DSMS Ground Communications System (GCS) as defined in DSMS 820-061. The scope extends from the GCS input interfaces at the DSCCs to the input of the user subsystems at the project Mission Operations Centers or other facilities.

In support of this task, the Contractor shall:

1. Provide general DSN Engineering support as described in Paragraph 4.1, as applicable to Communications System Network Engineering.

4.1.6 TEST ENGINEERING

A key element of the DSMS Service Capabilities Development (SCD) process is the test process. A part of the entire development life cycle of hardware and software, test engineering takes on critical importance during the acceptance testing.

During the development phase for DSN hardware and software, operations personnel will work with DSMS Engineering task personnel to learn the complete operational capabilities of the deliverable and to provide test design and requirements inputs.

During the pre-acceptance test phase, the Test Engineer will observe engineering testing and “rehearsals” of the acceptance test procedures. Operations personnel will also review and critique—individually or via peer review—key engineering test documents such as the release description document (RDD), software operator's manual (SOM), and software test plan (STP)/system integration and test plan (SITP).

During the acceptance test phase, the operations Test Engineer will perform the tests required in the DSMS test documents, evaluate software safety, and perform other tests that the Test Engineer deems necessary. The Test Engineer will also document test results and observed anomalies, using the DSMS anomaly reporting system. The Test Engineer will support and present at test readiness reviews, consent-to-ship reviews, and DSMS delivery reviews.

Test Engineers must be versed in test theory, test methodologies, software safety, and the fundamentals of design and operations for hardware and/or software (as appropriate to the task).

In support of this task, the contractor shall:

1. Provide tools to analyze software complexity and test coverage.
2. Support DSMS Engineering in pre-acceptance test phase.
3. Participate in test plan reviews by analyzing the test procedure documents in terms of complexity, function points, coverage, and other industry standard measures.
4. Participate in DSMS development-to-operations-process reviews as documented in DSMS 813-101.
5. Perform acceptance tests as documented in released test plans.
6. As required, generate additional test plans, including an operations test plan, modifications to DSMS test documents, and modifications to procedures.

7. Schedule tests and determine resource requirements (test equipment, station equipment, and personnel), based on delivered or draft test plans.
8. Document test results in test reports per DSMS 813-112, *DSMS Testing Standards and Guidelines*.
9. Document anomalies, using the DSMS anomaly reporting system.
10. Work with DSN Network Engineers to analyze and respond to anomalies.

This task has a special provision:

1. The task shall be performed by trained test engineers who are familiar with industry-standard or IEEE hardware and/or software development and test processes.
2. Test Engineers shall be versed in test methodologies, test theory, and the fundamentals of design and operations for hardware and/or software.

4.2 PRODUCT DEVELOPMENT AND SUSTAINING ENGINEERING

The complete set of DSMS hardware and software products is identified in the 820-061 Database. The Contractor will have sustaining responsibility for specific subsets of these items. The responsibility may be assigned at three levels:

- **Subsystem level:** The Contractor will be responsible for designing the subsystem, designing its components, and for implementing any sustaining modifications. The Contractor will have subsystem engineer (SSE) and assembly-level cognizant development engineer (CDE) responsibility.
- **Assembly (hardware item or software program) level:** The Contractor will be responsible for designing and sustaining the assembly, according to subsystem-level plans. The Contractor will have assembly-level CDE responsibility.
- **Sustaining level:** The Contractor will provide sustaining support to a JPL CDE for a specific assembly.

For data processing subsystems, the Contractor's sustaining responsibilities are associated with legacy systems that will eventually be phased out of the Network. The DSMS Engineering Program Office will periodically evaluate the assignment of new sustaining responsibilities.

In support of this task, the Contractor shall:

1. Perform product engineering assignments, in accordance with Appendix I, Product Engineering Assignments.
2. For subsystem-level assignments:
 - a. Generate and review subsystem designs and associated documents, per DSMS 813-101.

- b. Generate interface agreements and obtain approval of them.
 - c. Generate DSMS Deployment Plans (DDPs), per DSMS Document 813-106, *Preparation Guide for Implementation and Quality Plans*, for major subsystem upgrades and obtain approval of them.
 - d. Transfer to operations, in accordance with DSMS Document 813-125, *DSN Hardware Transfer and Delivery Procedures*; and 813-126, *DSN Software Transfer and Delivery Procedures*.
3. For assembly-level assignments:
- a. For assignments at the assembly level but not the subsystem level, obtain approval of delivery/modification schedules from the cognizant Service System Manager (SSM).
 - b. Produce assembly designs and associated documentation
 - c. Deliver any modkits associated with the assembly
 - d. Provide all documentation and training as required by DSMS documents 813-125 and 813-126.
4. For sustaining, support-level assignments:
- a. Prepare documentation and modkits associated with modifications, as required by DSMS documents 813-125 and 813-126.

4.2.1 FACILITIES DEVELOPMENT AND SUSTAINING

The Contractor will provide SSE and CDE functions for the DSN Technical Facilities Subsystem and for construction-of-facilities (CoF) projects. This task includes:

- Developing new and modified capabilities in DSN Facilities
- Sustaining engineering support for existing DSN Facilities
- Technical oversight of certain CoF projects

Facilities engineering encompasses:

- Power
- Lighting
- Grounding
- Site and civil construction
- Heating, ventilation, air conditioning (HVAC)
- Fire suppression and detection
- Nitrogen systems

In support of this task, the Contractor shall:

1. Provide development engineering of all DSCC facilities, infrastructure, and antenna facilities

- a. Perform analysis, design, fabrication, construction management, installation, verification, testing, evaluation, and documentation of existing or new equipment or facilities.
2. Provide engineering support and oversight of DSN CoF projects.
3. Develop or modify antenna support equipment or assemblies, according to DSMS documents 813-101 and 813-202.
4. Release design drawings and documentation, in accordance with DSMS 813-203-vol-1, *DSN Drawing Format and Content Standards: Volume 1, Equipment*, and DSMS 813-203-vol-2, *DSN Drawing Format and Content Standards: Volume 2, Facilities*.
5. Interact with other engineers for design development and project planning.
6. Conduct design reviews of all CoF-funded projects, in accordance with NPG 8820.2, *NASA Facility Projects Implementation Handbook (FPIH)*.

This task has the following special provisions:

1. This task shall be implemented by staff qualified for the following functions, as described in Appendix J, Contractor Staff Roles:
 - Facilities Design Engineer
 - Electrical Engineer
 - Mechanical Engineer
 - Civil Engineer
 - Designer and drafter
 - Geographic Information System (GIS) specialist

4.2.1.1 Facilities Subsystem Engineering

The Contractor will provide Facilities Subsystem Engineering by developing facilities-subsystem-level requirements and activities. The Facilities SSE will provide input into facilities concepts and update all planning documentation as appropriate.

In support of this task, the Contractor shall:

1. Identify potential facilities projects, using a computerized-maintenance management system (CMMS), facility condition assessment, and backlog of maintenance and repair (BMAR) report.
2. Develop the master-planning vision, criteria, and drivers for facilities, in coordination with the DSN CoF Program Office and the DSCCs, by providing:
 - a. Data collection and analysis
 - b. Assessment of facility inventory conditions

- c. DSCC land constraints
 - d. Assessment of environmental, utility, and transportation inventories
 - e. Assessment and forecast of facility demands and potential land-use alternatives
3. Provide inputs for facilities and antenna support equipment functional requirements.
 4. Support the DSMS Engineering Office in generating yearly facilities call-response metrics.
 5. Contribute and support special studies.
 6. For facilities, help CDEs assess and define user needs, utilization, and disposal planning and execution.
 7. Provide inputs to NASA real property database, for the construction and modification of facilities.
 8. Establish, populate, and maintain the DSN GIS database on a server that is accessible to authorized DSN users.
 9. Host NASA's Facilities Project Management System (FPMS) software on a server that is accessible to authorized DSN users.

4.2.1.2 Facilities Design Engineering

The Contractor will provide CDEs to support Facilities Design Engineering in the following:

- Power
- Lighting
- Grounding
- Site and civil construction
- HVAC
- Fire suppression and detection
- Nitrogen systems

In support of this task, the Contractor shall:

1. Develop requirements, and support functional requirement reviews and preadvertisement construction reviews.
2. Provide input to the DSMS Operations and Engineering program offices for siting new facilities.
3. Support the development of facility concept studies.

4. Develop requirements for selecting architect and engineering (A&E) services and provide them to the JPL A&E Selection Board.
5. Oversee facility construction and construction contracting.
6. Perform construction project management, and develop and execute facility activation plans for all new construction and facility modifications.
7. Perform the Project Definition Rating Index (PDRI) assessment for CoF–related facilities and antenna-support-equipment projects, and generate PDRI scores.
8. Request authority to advertise from DSN CoF Program Office for CoF–related projects.
9. Prepare and submit flash reports of bids.
10. Generate statements of work for CoF projects, using the Specifications-Kept-Intact (SPECSINTACT) System.
11. Interface with operations and maintenance personnel, users, and subsystems engineers, to ensure their coordination with other DSN subsystems and assemblies.
12. Support the facility SSEs in all aspects of Facilities and Antenna Support Equipment Systems, to ensure asset availability.
13. Generate and update antenna-support-equipment-related and facilities-related documents, interface agreements, drawings, specifications, functional requirements documents, schedules, and plans.

4.2.2 TEST PRODUCT DEVELOPMENT ENGINEERING

The Contractor will develop the software required to analyze and validate system performance. Whenever a new capability is delivered to the network, the Contractor will validate the performance of the new capability in terms of its stability, bit error rates, and other system performance measurements, using the System Performance Test Assembly (SPTA). Additionally, the Contractor will analyze problems or anomalous conditions, using JPL and Contractor software tools. This task provides for the development of Contractor tools and SPTA. The contractor will also provide supporting hardware for the network.

The Contractor will develop, maintain, deliver, and archive the software in accordance with the SCD process and appropriate required DSMS documents.

In support of this task, the Contractor shall:

1. Develop System Performance Test and other test capabilities that are required for operations and maintenance support.

- a. Generate SPT software and hardware requirements and review them in accordance with DSMS Document 813-101.
- b. Document SPT operations procedures, in accordance with DSMS Document 810-001.
- c. Procure required and approved SPT hardware.
- d. Test and transfer the hardware and software, according to DSMS documents 813-125 and 813-126.
- e. Develop databases and applications software to assist the DSN facilities in performing operations and maintenance tasks.
- f. Develop and document analysis support software.
- g. Archive all developed software in Software Production Management and Control (SPMC).
- h. Sustain the software by adding new capabilities as required or requested by DSN personnel, and as approved by the DSMS Operations Program Office.

5 DIRECTED EFFORTS/TASKS

The Contractor will provide the necessary labor, materials, and facilities required to support directed efforts and tasks:

- Product development and sustaining in support of Deep Space Mission System (DSMS) engineering
- Construction, restoration, removal, relocation, maintenance, installation, or alteration of existing facilities funded by NASA's Construction of Facilities (CoF) program
- Short-term work—support of planned implementation of new Deep Space Network (DSN) capabilities that have schedule constraints and that are temporary in nature. This support includes emergency antenna or facility maintenance support and extended downtime where onboard skills or resources must be augmented.
- Real-time or short-term variations in the scope of the task description document (TDD) or JPL-directed support
- Temporary use of Contractor support not covered in the task description document
- Emergency antenna or facility maintenance support and extended downtime where onboard skills or resources must be augmented

5.1 PRODUCT DEVELOPMENT AND SUSTAINING

This task provides the necessary labor, materials, and facilities needed to support DSN engineering development and sustaining activities that are short-term in nature. The Contractor will be tasked to support these activities via a contract work order (CWO) for the duration of the contract year defined in the annual operating plan (AOP). If the work extends beyond the AOP contract year, this work will be included in the JPL budget guidelines and in the AOP for the following contract year.

In support of this task, the Contractor shall:

1. Provide task estimates within the time specified in the contract technical manager's (CTM's) request. Estimates shall include staffing requirements, costs, and schedules for accomplishing the specified work.
2. Perform the work after receiving JPL contract negotiator authorization to incur cost while the CWO is being processed.
3. Provide deliverables in accordance with CWO specifications.
4. Provide monthly reports of schedule, technical, and cost performance to the CTM and the JPL (or JPL subcontractor) task manager.

5.2 CONSTRUCTION AND MAJOR MODIFICATION TO EXISTING FACILITIES

CoF includes minor facility projects such as revitalization, minor construction, environmental compliance and restoration projects, and major modifications to existing facilities.

When new construction and major modifications to existing facilities require use of Contractor expertise in these areas, the JPL contract negotiator, at the request of the CTM, may issue CWOs to the Contractor to perform this work.

The CWOs will list those projects within each program, as shown on the NASA HQ DIV Form 800, *NASA Minor Facilities Projects—Summary Brief Project Document (SBPD)*, and the approved funding as authorized by NASA Form 506A, Resources Authority Warrant. (Other specific submittals may be required based upon the specific language in the annual call for CoF projects, e.g., EconPAK economic analyses.) The CWO may also authorize the Contractor to use subcontractors.

In support of this task, the Contractor shall:

1. Establish and maintain a procedure for coordinating with and keeping the Contracting Officer and CTM informed about facility management, including the process for acquiring facilities.
2. Implement projects under the authority of the SBPD to the intent and scope set forth in NASA Form 1509, *Facility Project Brief Project Document*, as approved by the Director, Facilities Engineering Division, or designee.
3. Ensure that environmental compliance and restoration (ECR) projects implemented under the authority of the ECR-SBPD conform to the intent and scope set forth in the project approval document, as approved by the NASA HQ Director, Environmental Management Division (Code JE), and placed in a CWO by the Contracting Officer.
4. Comply with resource allocations. The amount shown as the “Approved Program Plan” in the SBPD or ECR-SBPD indicates the total resources available for projects by the related NASA Form 506A. At no time shall fiscal obligations exceed this amount. The intent and scope of the project shall remain as indicated on the approved NASA Form 1509.
5. Comply with the criteria, procedures, and reporting requirements for ongoing CoF projects, as set forth in NPG 8820.2, *Facility Project Implementation Handbook*.
6. Comply with all NASA issuances applicable to the construction or major modification of government-owned and Contractor-leased facilities. These issuances are enumerated in Appendix C, Applicable Documents. Deviations, variations, and exceptions to requirements in these documents must be

approved by the NASA HQ Director, Facilities Engineering Division (Code JX), through the DSMS CoF manager and the CTM.

7. Ensure that all facilities-related computer-aided design (CAD) data complies with the National CAD Standard (NCS) published by the National Institute for Building Sciences (NIBS).

5.3 SHORT-TERM WORK

The Contractor will perform short-term work when the duration of the requirement can be estimated with a high degree of accuracy. The Contractor's work requirement may be for staffing, procurements, or both. At the request of the CTM, the JPL contract negotiator will issue a CWO to the Contractor to perform this work. Short-term work will not normally be considered for inclusion in the next revision of the TDD because of its finite duration.

In support of this task, the Contractor shall:

1. Provide task estimates within the time specified in the CTM request. Estimates shall include staffing requirements, costs, and schedules for accomplishing the specified work.
2. Coordinate with the CTM in preparing a CWO.
3. Provide deliverables in accordance with CWO specifications.
4. Provide monthly reports of schedule, technical, and cost performance to the CTM.

5.4 CHANGES TO THE TDD

After the current AOP is approved, the TDD may change because of changes in requirements for JPL-directed support or changes in the level of support required by TDD tasks. The changes will normally involve staffing and be of sufficient duration to be included in the next revision of the TDD.

In support of this task, the Contractor shall:

1. Provide task estimates within the time specified in the CTM request. Estimates shall include staffing requirements, costs, and schedules for accomplishing the specified work.
2. Perform the work as directed by the JPL contractor negotiator.
3. Provide deliverables in accordance with CWO specifications.
4. Provide monthly reports of schedule, technical, and cost performance to the CTM.
5. Document the CWO for inclusion in the next revision of the AOP and TDD.

5.5 EMERGENCY REQUIREMENTS

Emergencies in the DSN may occur at any time, for example, because of equipment failures or unplanned facilities maintenance. Emergencies may require the Contractor to use resources outside the scope of the AOP; a CWO will be issued to cover such costs. CWOs of this type will be for a specific one-time requirement and will not be included in the next revision of the TDD.

In support of this task, the Contractor shall:

1. Perform the work that is within the scope of the AOP after receiving technical direction from the CTM. The Contractor shall perform the work that is outside the scope of the AOP after receiving technical direction from the JPL contract negotiator.
2. Record actual expenditures based on CTM technical direction.
3. Provide task estimates within the time specified in the CTM request. Estimates shall include staffing requirements, costs, and schedules for accomplishing the specified work.
4. Coordinate with the CTM in preparing a CWO to cover work performed by the Contractor.
5. Provide deliverables in accordance with CWO specifications.
6. Provide monthly reports of schedule, technical, and cost performance to the CTM.

6 APPENDIX A: ACRONYMS AND OTHER ABBREVIATIONS

Table 6-1 expands acronyms, initializations, and other abbreviations used in the body of this document.

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
A&E	architect and engineering
AFB	air force base
AMMOS	Advanced Multi-Mission Operations System
AoE	area of emphasis
AOP	annual operating plan
AR	anomaly report
AT	acceptance test
AT	acceptance testing
BMAR	backlog of maintenance and repair
BRT	business and restricted technology
BWG	beam waveguide
CAD	computer-aided design
CCB	change control board
CCF	Central Coordinating Facility
CCR	California Code of Regulations
CCT	Central Communications Terminal
CDE	Cognizant Development Engineer
CDE	cognizant development engineering
CDRL	Contract Data Requirements List
CDR	central data recorder
CDR	Critical Design Review
CDSCC	Canberra Deep Space Communication Complex
CFC	chlorofluorocarbon
CFMA	Critical Facilities Maintenance Assessment
CMF	Complex Maintenance Facility
CMMS	computerized-maintenance management system
CNC	computer numerical control
Code JE	NASA Energy and Environmental Management Division
CoF	Construction of Facilities
CPR	cardiopulmonary resuscitation
CRDE	Complex Research-and-Development Engineer

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
CSP	Certified Safety Professional
CTM	Contract Technical Manager
CTT	Compatibility Test Trailer
CVS	central voice switch
CVT	central voice terminal
CWO	contract work order
DCT	design control tables
DDOR	delta-differenced one-way ranging
DDP	DSMS Deployment Plans
DLF	DSN Logistics Facility
DMD	Data Monitor Display
DMR	detailed mission requirements
DOD	Department of Defense
DOM	Distributed Objects Manager
DPDS	DSMS Product Distribution System
DR	discrepancy report
DRMS	Discrepancy Reporting Management System
DSCC	deep-space communications complex
DSMS	Deep Space Mission System
DSN	Deep Space Network
DSO	Data Systems Operations
DSOCC	Deep Space Operations Control Center
DSPA	Data System Processing Area
DSR	daily status report
DSS	deep-space stations
DTF	Development and Test Facility
DTR	detailed technical review
EAR	U.S. Export Administration Regulations
ECC	Emergency Control Center
ECM	engineering change management
ECO	engineering change order
ECR	engineering change requests
ECR	environmental compliance and restoration
EDCATS	Education Program Data Collection and Evaluation System
EIS	environmental impact statement
FAA	Federal Aviation Administration

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
FBI	Federal Bureau of Investigation
FIP	facility implementation plan
Force Con	Force Condition
FPIH	Facility Projects Implementation Handbook
FPMS	Facilities Project Management System
FTS	frequency and timing subsystem
FY	fiscal year
GAVRT	Goldstone–Apple Valley Radio Telescope
GCF	Ground Communications Facility
GCS	Ground Communications System
GDSCC	Goldstone Deep-Space Communications Complex
GFE	Government-furnished equipment
GFP	Government-furnished property
GIF	Ground Interface Facility
GIS	geographic information system
GISO	General Industry Safety Orders
GNIMS	Goldstone NTC Inter-Range Microwave System
GOF	Government-owned facility
GSA	General Services Administration
GSFC	Goddard Space Flight Center
GSSR	Goldstone Solar System Radar
HAZMAT	hazardous material
HBI	hydrostatic bearing instrumentation
HEF	high-efficiency antenna
HEO	high-Earth-orbit
HPTTF	High-Power Transmitter Test Facility
HSB	high-speed BWG
HVAC	heating, ventilation, and air conditioning
IDR	intermediate data record
IF	intermediate frequency
IND	Interplanetary Network Directorate
ISDN	integrated services digital network
ITAR	International Traffic in Arms Regulations
ITS	information technology security
JPL	Jet Propulsion Laboratory
JURAP	joint user-resource-allocation planning

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
KSC	Kennedy Space Center
LAN	local area network
LEO	low-Earth orbit
LPG	liquefied petroleum gas
LRE	lowest-replaceable element
MCC	modified configuration control
MCG	Mojave Coordination Group
MDAP	mission-data acquisition planning
MDSCC	Madrid Deep Space Communication Complex
MERR	Mission Event Readiness Review
MIA	Monitor Interface Assembly
MIL	Merritt Island Launch (Support)
modkit	modification kit
MOU	memorandum of understanding
MP	Military Police
MSDS	material safety data sheet
MSN	NASA-defined mission data
MTTR	mean time to repair
NASA	National Aeronautics and Space Administration
NCS	National CAD Standard
NEC	National Electric Code
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NIBS	National Institute for Building Sciences
NIS	network information services
NISN	NASA Information Services Network
NIST	National Institute of Standards and Technology
NMC	Network Monitor and Control
NMO	NASA Management Office
NOCC	Network Operations Control Center
NOCC-RT	NOCC real time
NOCT	Network Operations Control Team
NOP	network operations plan
NPD	NASA Policy Document
NPG	NASA Procedures and Guidelines
NRP	NASA Resource Protection

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
NSS	Network Support Subsystem
NTC	national training center
NTIA	National Telecommunications and Information Administration
NVP	Network VLBI Processor
NWTC	Naval weapons training center
O&M	operations and maintenance
ODF	orbit data file
ODS	ozone-depleting substance
OIC	officer in charge
OMM	operations and maintenance manual
OTP	operation test plan
PBO	Programmatic Biological Opinion
PCFS	PC field system
PDMS	Product Data Management System
PDCS	Preliminary Definition and Cost Review
PDR	Preliminary Design Review
PDRC	Preliminary Definition and Cost Review
PDRI	Project Definition Rating Index
PIT	project interface test
PLO	programmable local oscillator
POCC	Project Operations Control Center
POL	petroleum and oil lubricants
POP	program operating plan
PPE	personnel protective equipment
R&D	research and development
R&D PEM	Research & Development Project Element Manager
R/A	radio astronomy
RAP	resource allocation planning
RAPSO	Resource Allocation Planning and Scheduling Office
RAPT	Resource Allocation Planning Team
RARB	Resource Allocation Review Board
RASA	radio astronomy and special activities
RCM	Reliability-Centered Maintenance
RCRA	Resource Conservation and Recovery Act
REA	Registered Environmental Assessor
RF	radio frequency

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
RFI	radio-frequency interference
RFS	Radio Frequency Surveillance System
RMDC	radio-metric data conditioning
RNS	reliable network server
ROSA	Remote Operations Support Area
RSL	Reference Standards Laboratory
SAF	Spacecraft Assembly Facility
SBPD	Summary Brief Project Document
SCE	Southern California Edison
SCMT	service commitment process
SFG	special-function gateway
SFOF	Space Flight Operations Facility
SITP	System Integration Test Plan
SLE	space link extension
SOEs	sequences of events
SOP	standard operations procedure
SOW	statement of work
SPC	Signal Processing Center
SPECSINTACT	Specifications-Kept-Intact
SPMC	Software Production Management and Control
SPT	system performance test
SPTA	System Performance Test Assembly
SSE	Subsystem Engineer
SSF	software support file
SSM	Service System Manager
SVC	service capabilities development process
SVE	service execution process
SVLBI	space very-long-baseline interferometry
SVS	Station Voice Switch
SVT	Station Voice Terminal
TDD	task description document
TDDS	Tracking-Data Delivery System
TDS	Telemetry Delivery System
TIS	Telemetry Interface System
TMS	Telecommunications and Mission Systems
TMS	Telemetry and Mission Support

Table 6-1: Acronyms and Other Abbreviations

Term	Expansion
TPS	third-party software
TSS	Tracking Support Specialists
TTC&DM	tracking, telemetry, command, and data management
UPS	uninterruptable power supply
UWV	microwave subsystem
VOCA	Voice-Operational Communications Assembly
VLBI	very-long-base interferometry
WA	Workmanship Assurance
WBC	Wide Band Very Long Base Interferometry Correlator

Table 7-1 is a glossary that defines terms used in this document with special, limited, or specific meanings.

Table 7-1: Glossary

Term	Expansion
all	any and/or all
any	any and/or all
caretaker maintenance	the protection of exposed structural and mechanical surfaces
complex maintenance facility	a maintenance facility where the Contractor tests LREs and repairs or sends them to the vendor or , for JPL-designed assemblies, to JPL for repair.
contract	a mutually binding legal relationship obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them. It includes all types of commitments that obligate the Government to an expenditure of appropriated funds and that, except as otherwise authorized, are in writing. In addition to bilateral instruments, contracts include (but are not limited to) awards and notices of awards; job orders or task letters issued under basic ordering agreements; letter contracts; orders, such as purchase orders, under which the contract becomes effective by written acceptance or performance; and bilateral contract modifications. Contracts do not include grants and cooperative agreements covered by 31 U.S.C.6301, et seq. For discussion of various types of contracts, see the FAR Part 16.
Contractor	Capitalized, "Contractor" is the other party signing a contract with JPL (on behalf of NASA) to provide DSN O&M; "contractor" refers to a contractor in general.
corrective maintenance	The repair and restoration of equipment to service.
corrective maintenance, Level 1	Switching to backup equipment, when available, to restore data services and minimize data outages. Performed in situ by operators or technicians, 24 hour a day, seven days a week.
corrective maintenance, Level 2	The in situ diagnosing, troubleshooting, and replacing of failed assemblies or lower-replacement elements (LREs)
corrective maintenance, Level 3	maintenance of items that cannot be repaired in situ but instead require the capabilities of the Complex Maintenance Facility (CMF)
custodial maintenance	maintenance to ensure basic mechanical operation
including	including but not limited to
periodic maintenance	scheduled, routine maintenance

Table 7-1: Glossary

Term	Expansion
preventive maintenance	maintenance to prevent failures.
radio metric	data based on measurement of the RF carrier or modulated RF carrier. Includes Doppler phase, angles, range, and VLBI (DDOR)
reliability-centered maintenance	maintenance performed based on the probability of failure—a type of predictive maintenance
shall	the imperative; mandatory

8

APPENDIX C: APPLICABLE DOCUMENTS

Table 8-1 provides references for applicable documents cited in the body. Where the document is cited in a particular WBS, the WBS number is given. All documents in this table are included in the TDD by reference. Where the standards conflict, the more rigorous standard shall apply.

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
1.1.3	(various)	All NPG, NPD, and executive orders in this appendix.
1.1.3 2.1.3	CCR Title 8	General Industrial Safety Orders (GISO)
1.1.3 1.1.4 2.1.3	JPL D-560	JPL Standard for Systems Safety
1.1.3 2.1.3	NPD 8710.2	NASA Safety and Health Program Policy
1.1.3 2.1.3	NPG 8715.1	NASA Safety and Health Handbook Occupational Safety and Health Programs
1.1.3 2.1.3	NPD 8621.1	NASA Mishap and Close Call Reporting
1.1.4 2.1.3 2.5.2	(various)	Cal/OSHA requirements
1.1.4	D-560	JPL Standards for Systems Safety
1.1.5 5.2	NPD 8820.3	Facility Sustainable Design
1.1.5 2.1.4	NPD 8500.1*	NASA Environmental Management
1.1.5 2.1.4	NPG 8820.3*	Pollution Prevention
1.1.5 2.1.4	NPG 8830.1*	Affirmative Procurement of Environmentally Preferable Products
1.1.6 2.1.2 3.1.1.2	NPG 1620.1*	Security Procedures and Guidelines, subject to approved NASA code X waivers
1.1.6 2.1.2	DOD 5220.22-M & Supplements	National Industrial Security Program Operating Manual (NISPOM)
1.1.6 2.1.2	—	Presidential Decision Directives
1.1.7	D-23140	DSMS Information Technology Security Policy
1.1.7	D-17896	DSMS Information Technology Security Requirements for Computer Systems

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
1.1.7	D-7155	JPL IT Security Requirements for Computer Systems
1.1.7	D-7223	JPL IT Security Requirements
1.1.7 3.1.1.2	NPG 2810.1*	Security of Information Technology
1.3	NPD 8800.14	Policy for Real Property Management
1.3 2.5.1.11	DSMS 890-165	Directory of DSCC Facilities: the Goldstone Gold Book
1.3 5.2	NPG 8800.15	Real Estate Management Program Implementation Manual
1.6	NPG 8000.4	Risk Management Procedures and Guidelines
2 2.2 3.1.4.1	DSMS 810-005	DSMS Telecommunications Link Design Handbook
2.1.1 2.1.8 2.1.10	—	MOU between DOD and NASA for Compatible Operations in the Mojave Desert Area ("Mojave Coordination Agreement")
2.1.2	NPD 1600.2	NASA Security Policy
2.1.2	—	The National Resources Protect Act, subject to Code X agreed-to waivers
2.1.3	NPD 8621.1*	NASA Mishap and Close-Call Reporting, Investigation, and Recordkeeping
2.1.3	NPG 8621.1	NASA Procedures and Guidelines for Mishap Reporting, Investigating, and Recordkeeping
2.1.3	NPD 8710.1	Emergency Preparedness Program
2.1.3	NPD 8710.5*	NASA Safety Policy for Pressure Vessels and Pressurized Systems
2.1.3	NPG 8715.2	NASA Emergency Preparedness Plan Procedures and Guidelines
2.1.3	NPG 8715.3	NASA Safety Manual with Changes through Change 1, 6/19/02
2.1.3	NASA-STD-8719.9	Standard for Lifting Devices and Equipment
2.1.3	NASA-STD-8719.7	Facility System Safety Guidebook
2.1.3	NASA-STD-8719.11	NASA Safety Standard for Fire Protection
2.1.3	(various)	National Fire Protection Association (NFPA), NASA requirements for fire protection
2.1.4	NPG 8580.1*	Implementing The National Environmental Policy Act And Executive Order 12114

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
2.1.4	—	The Resource Conversation and Recovery Act (RCRA)
2.1.4	—	The Clean Air Act
2.1.4	—	The Endangered Species Act
2.1.4	—	The National Historic Preservation Act
2.1.4	Executive Order 11514	Protection and Enhancement of Environmental Quality
2.1.4	Executive Order 11593	Protection and Enhancement of the Cultural Environment
2.1.4	Executive Order 11988	Floodplain Management
2.1.4	Executive Order 12088	Federal Compliance with Pollution Control Standards
2.1.4	Executive Order 12580	Superfund Implementation, Amended by 13016 and 12777
2.1.4	Executive Order 12843	Procurement Requirements and Policies for Federal Agencies of Ozone-Depleting Substances
2.1.4	Executive Order 12856	Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements
2.1.4	Executive Order 12941	Seismic Safety of Existing Federally Owned or Leased Buildings
2.1.4	Executive Order 13007	Indian Sacred Sites
2.1.4	Executive Order 13101	Greening the Government Through Waste Prevention, Recycling, And Federal Acquisition
2.1.4	Executive Order 13112	Invasive Species
2.1.4	Executive Order 13132	Federalism
2.1.4	Executive Order 13148	Greening the Government Through Leadership in Environmental Management
2.1.4	Executive Order 13149	Greening the Government Through Federal Fleet and Transportation Efficiency
2.1.4	Executive Order 13150	Federal Workforce Transportation
2.1.4	Executive Order 13175	Consulting and Coordinating with Indian Tribal Governments
2.1.4	Executive Order 13186	Responsibility for Federal Agencies to Protect Migratory Birds
2.1.4	Executive Order 13211	Actions Concerning Regulations that Significantly Affect Energy Supply Distribution or Use

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
2.1.4	Executive Order 13221	Energy Efficient Standby Power Devices
2.1.4□	NPG 8830.1	Affirmative Procurement of Environmentally Preferable Products
2.1.5	42 USC 8251-8287	National Energy and Water Conservation Policy Act, as amended by the Energy Policy Act of 1992, P.L. 102-486
2.1.5	Executive Order 13123	Greening the Government Through Efficient Energy Management
2.1.5	10 CFR 434	Federal Energy Building Code
2.1.5	CCR Title 24	Energy Efficiency Code
2.1.5	NPG 8570.1	Energy Efficiency and Water Conservation Technologies and Practices
2.1.5 5.2	NPG 7120.5*	NASA Program and Project Management Processes and Requirements
2.1.9	NPD 1383.1	Release and Management of Audiovisual Products and Services
2.1.9	NPD 1383.2	NASA Assistance to Non-Government Entertainment-Orientated Motion Picture, Television, Video, and Multimedia Production/Enterprises and Advertising
2.1.9	NPG 1387.1	NASA Exhibits Program
2.1.9	NPD 1392.1	Conduct of the NASA Education Program
2.2 3.1.7	DSMS 842	Standard Operating Procedures
2.2 3.1.1.1 3.1.2 3.1.5.2 3.1.6 3.2.3 4.1	DSMS 841-001	DSN Standard Operations Plan
2.3.1	DSN-STD-1015	Welding Structural Steel
2.3.1 2.3.3	DSN-STD-1006	Painting or Thermal Coating—DSN Antennas and Supporting Structures
2.3.4 2.4.2	NPD 8730.1	Metrology and Calibration
2.4 3.2.2 3.2.3 3.2.4 4.1 4.1.5 4.2	DSMS 820-061	DSMS Subsystem, Configuration Item, and Responsibility Definition

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
2.4 3.2.4	DSMS 814-007	DSN Maintenance Program
2.4 4.1.3	DNS 9442211	DSN Top Assembly Drawing
2.4	ISO 9001-2000	Quality Management Systems—Requirements
2.5 5.2	NPG 8831.2*	Facilities Maintenance Management
2.5 5.2	NPD 8831.1*	Management of Facilities Maintenance
2.5 3.2.4	NPD 8720.1	NASA Reliability and Maintainability (R&M) Program
2.5.1.3	NFPA 70	National Electric Code
2.5.1.3	NFPA 70B	Recommended Practice for Electrical Equipment Maintenance
2.5.1.3	NFPA 70E	Standard for Electrical Safety Requirements for Employee Workplaces
2.5.1.5	22 CCR 64683	
2.5.1.5	22 CCR 64684	□
2.5.1.8	8010-20B	California Department of Transportation Specification for Paint, Waterborne Traffic Line, White, Yellow, and Black
2.5.1.10	Title 27 CCR	California Integrated Waste Management Board
2.6.1	99-720-149	GAVRT Memorandum of Understanding
2.7.1	DSMS 874-021	Workmanship Assurance Program for Goldstone DSCC
2.7.1	DSMS 874-012	Quality Assurance Program Plan for the Deep Space Network Hardware.
3.1.1.1	DSN 842-50-311	DSN Discrepancy Reporting Policy and Operations/Management of the Discrepancy Reporting Management System
3.1.1.1	SOP 842-179	DSN Real and Near-realtime Coordination Procedure
3.1.1.1 3.2.3	DSMS 820-13	DSN System Requirements—Detailed Interface Design
3.1.4.2	SOP 842-50-31	Standard Use of the Discrepancy Reporting System
3.1.7	DSMS 814-004	Preparation Guide for DSMS Operations Procedures
3.2.1	DSMS 814-005	DSN Flight Interface Compatibility Design Handbook
3.2.2 4.1.1	DSMS 813-023	DSMS Configuration Management Procedures
3.2.2 4.2 4.2.2	DSMS 813-125	DSN Hardware Transfer & Delivery Procedures

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
3.2.2 4.2 4.2.2	DSMS 813-126	DSN Software Transfer & Delivery Procedures
3.2.3	DSMS 820-013	DSMS External Interface Specifications
3.2.3 4.1.4	DSMS 820-016	DSMS Subsystem Software Interfaces
3.2.3	DSMS 820-017	DSMS Detailed Hardware Interfaces
3.2.3 3.2.4 4.1.1	DSMS 813-021	TMOD DSMS Document Process Procedures
3.2.3 4.1.4	DSMS 820-019	DSMS Drawing Process and Procedures
3.2.3 4.1 4.2.2	DSMS 810-001	DSMS Documentation Structure, Standards, and Definitions
4.1 4.1.6 4.2 4.2.1 4.2.2	DSMS 813-101	Guideline for SCD Reviews
4.1.1	DSMS 813-203	DSN Drawing Format and Content Standards: Vol. 1, Equipment
4.1.1	DSMS 813-022	TMOD DSMS Document Process Procedures
4.1.1 4.2.1	DSMS 813-202	Design Requirements for Deep Space Network Equipment
4.1.1	DSMS 820-019	DSMS Interface Design Standard
4.1.6	NASA-STD-8719.13	Software Safety
4.1.6	813-112	DSMS Testing Standards and Guidelines
4.2	DSMS 813-011	DSMS Service Capability Development Process
4.2.1 5.2	NPG 8820.2	Facility Project Implementation Handbook
5.2	NASA form 800	NASA Minor Facilities Projects—Summary Brief Project Document (SBPD)
5.2	NASA form 506A	Resources Authority Warrant
5.2	NASA forms 1509, 1510	Facility Project Brief Documents
5.2	NPD 8800.14	Policy for Real Property Management
5.2	NPD 8820.2	Design and Construction of Facilities
5.2	----	National CAD Standard (NCS)

Table 8-1: Applicable Documents

WBS #	Doc No.	Title or Description
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**Denotes conditional acceptance. Please see contract source for application conditions.*

Figure 9-1 is a map of the GDSCC and vicinity.

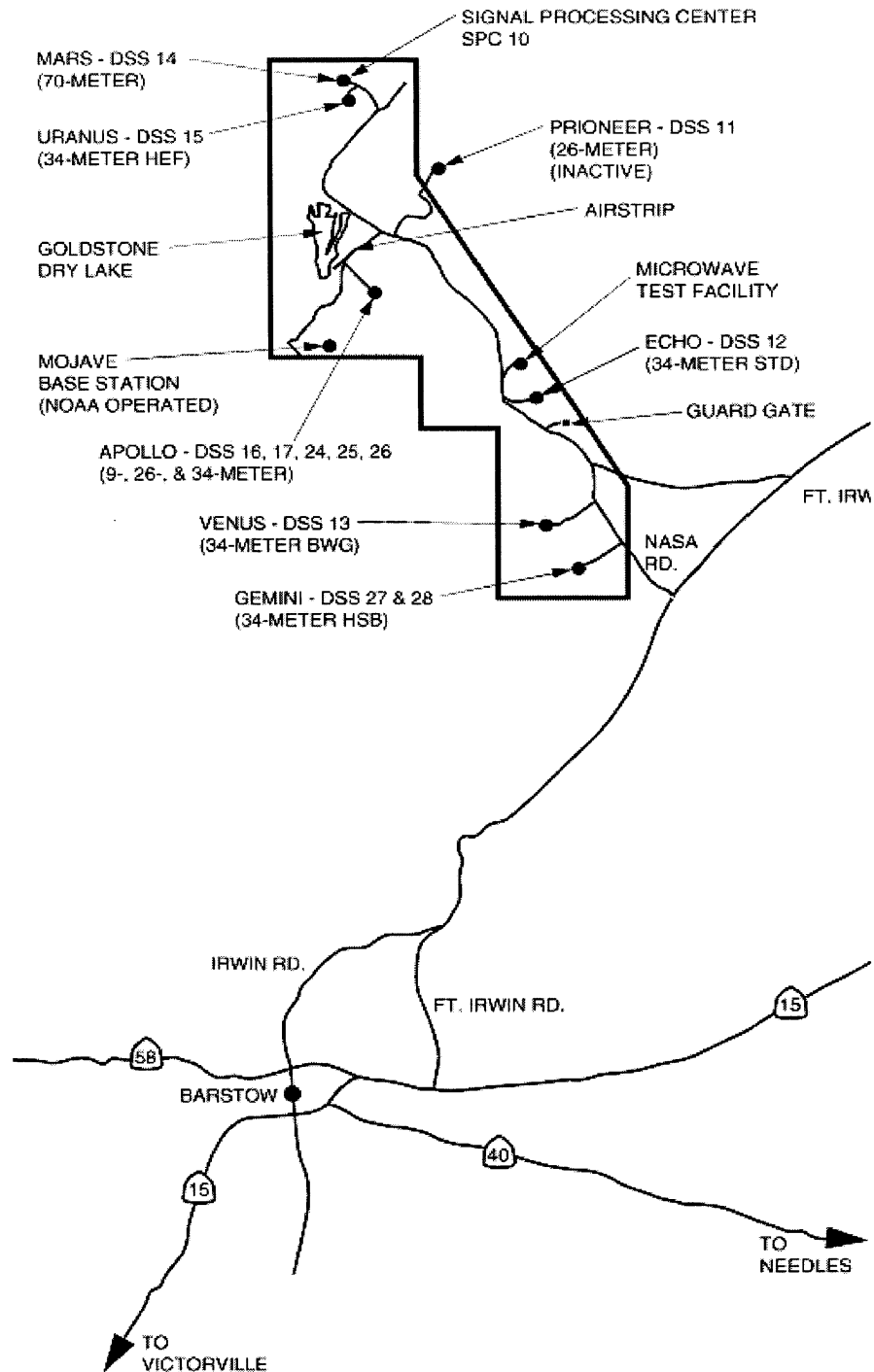


Figure 9-1: GDSCC and vicinity

10 APPENDIX E: DSMS PROCESSES

Figure 10-1 is an overview diagram of DSMS processes. Some of these processes are described in more detail in subsequent appendixes.

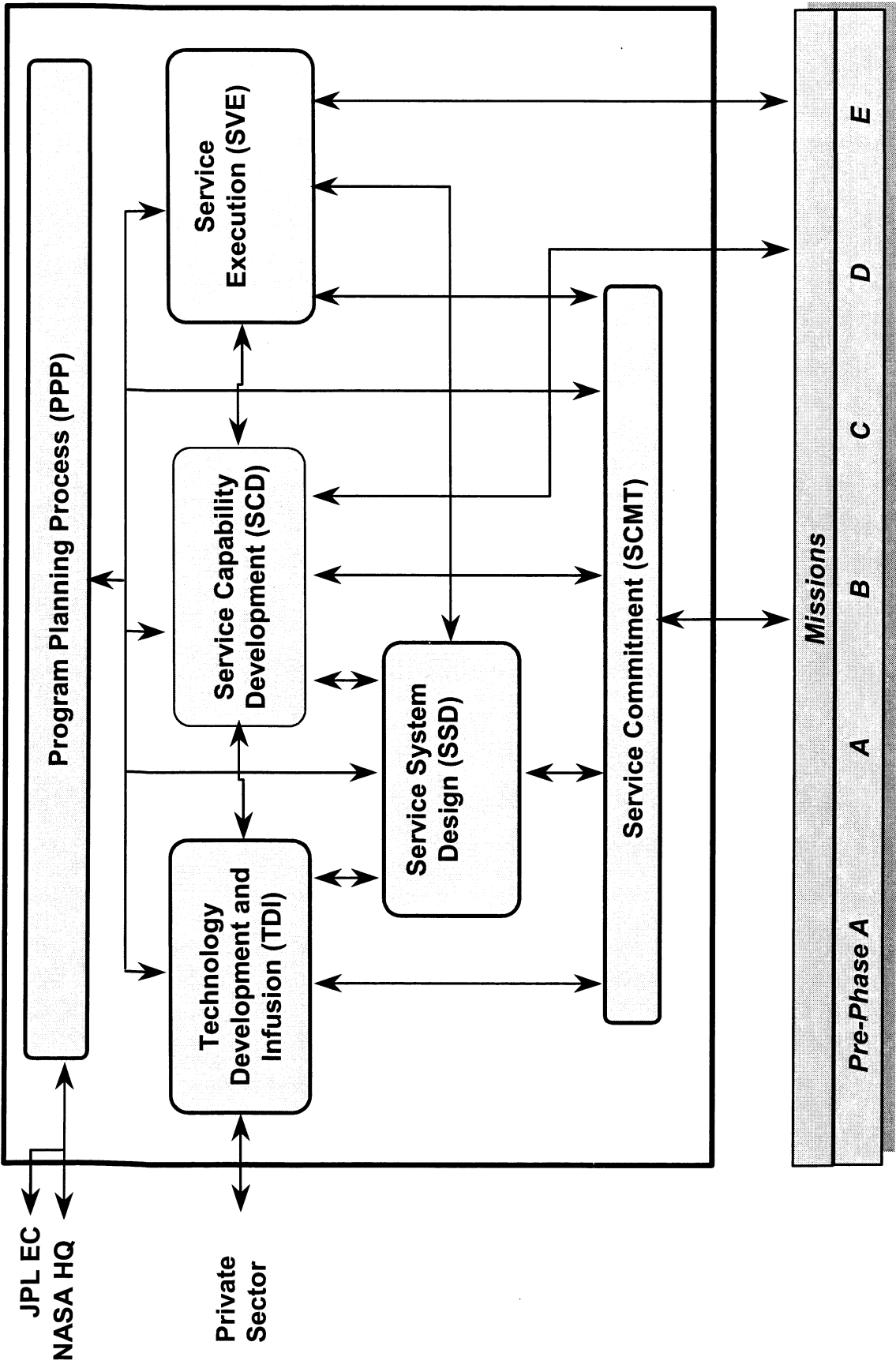


Figure 10-1: DSMS Processes

11 APPENDIX F: SERVICE COMMITMENT PROCESS

Figure 11-1 is a diagram of the service commitment process (SCMT) that shows its inputs, outputs, controls, and resources.

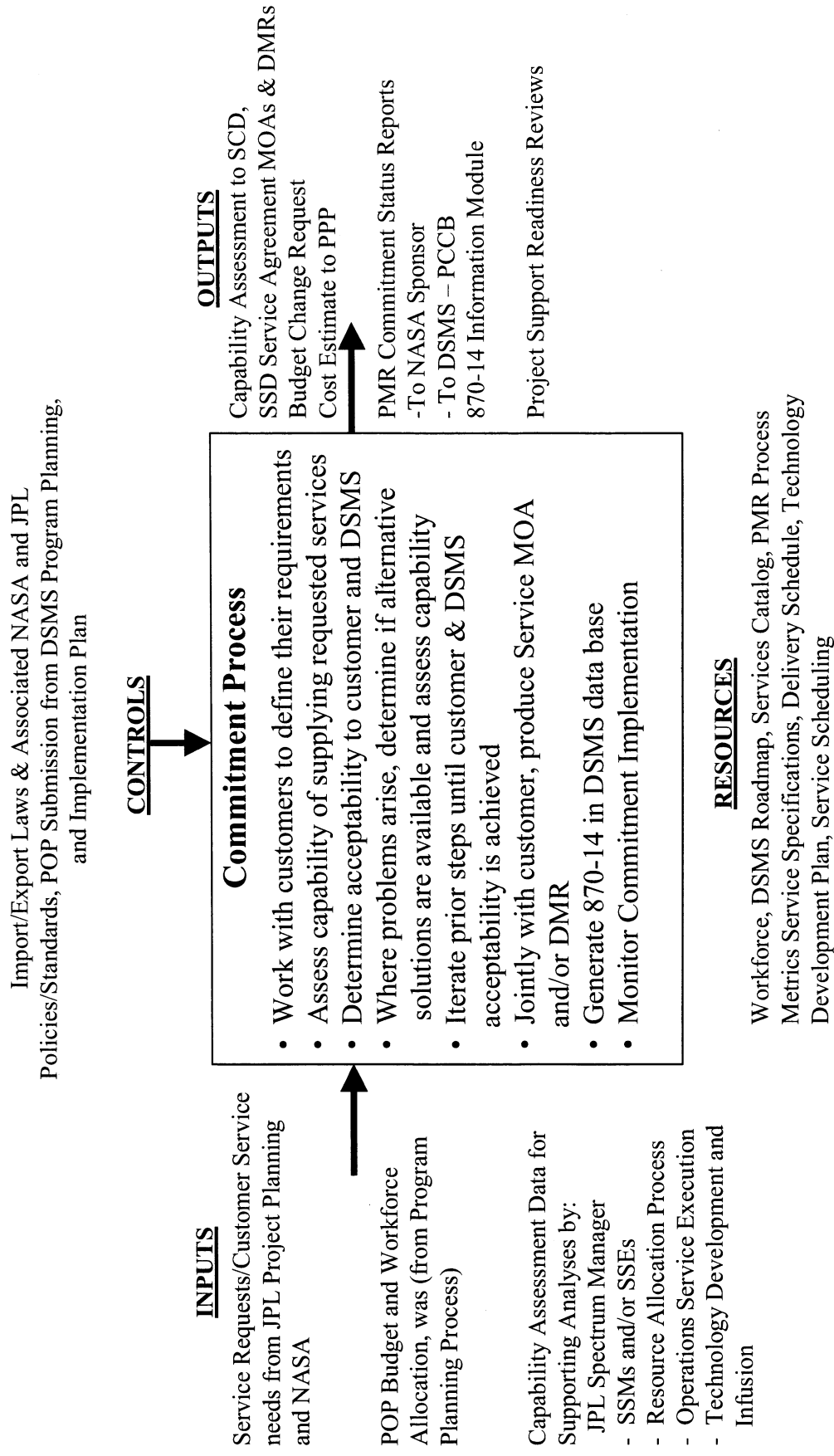


Figure 11-1: Inputs, Controls, Outputs, and Resources for the Service Commitment Process.

12 APPENDIX G: SERVICE CAPABILITIES DEVELOPMENT PROCESS

Figure 12-1 is an overview of the data flow of the service capabilities development process (SVC). Figure 12-2 is an SVC process timeline for a simple case, and Figure 12-3 is an SVC process timeline when service execution is also involved.

SCD Process Procedures

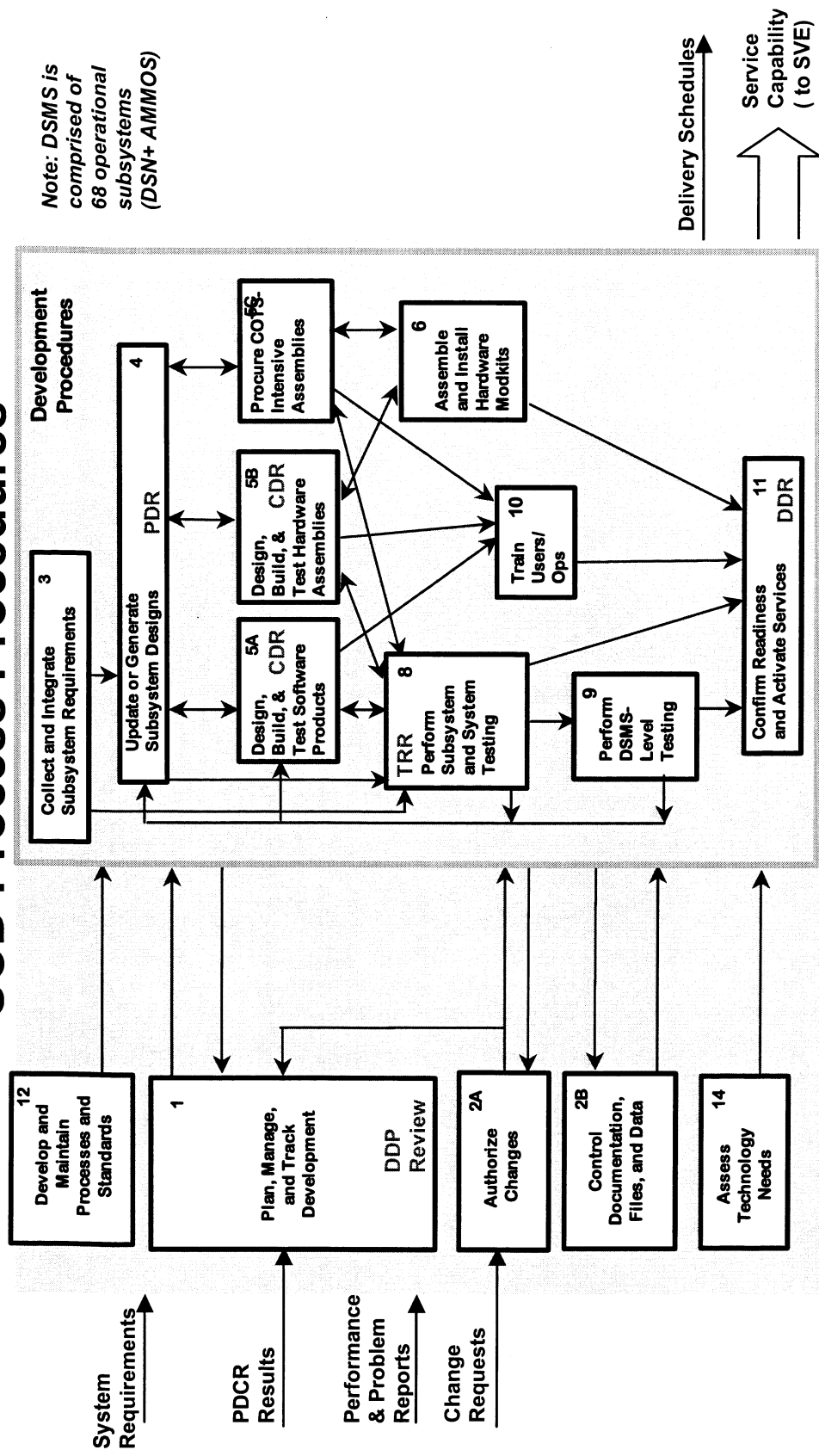


Figure 12-1: Overview of the Procedures for the SCD Process

SCD Process Timeline (simple case)

(no antenna/facility downtime, minimal on-site AT)

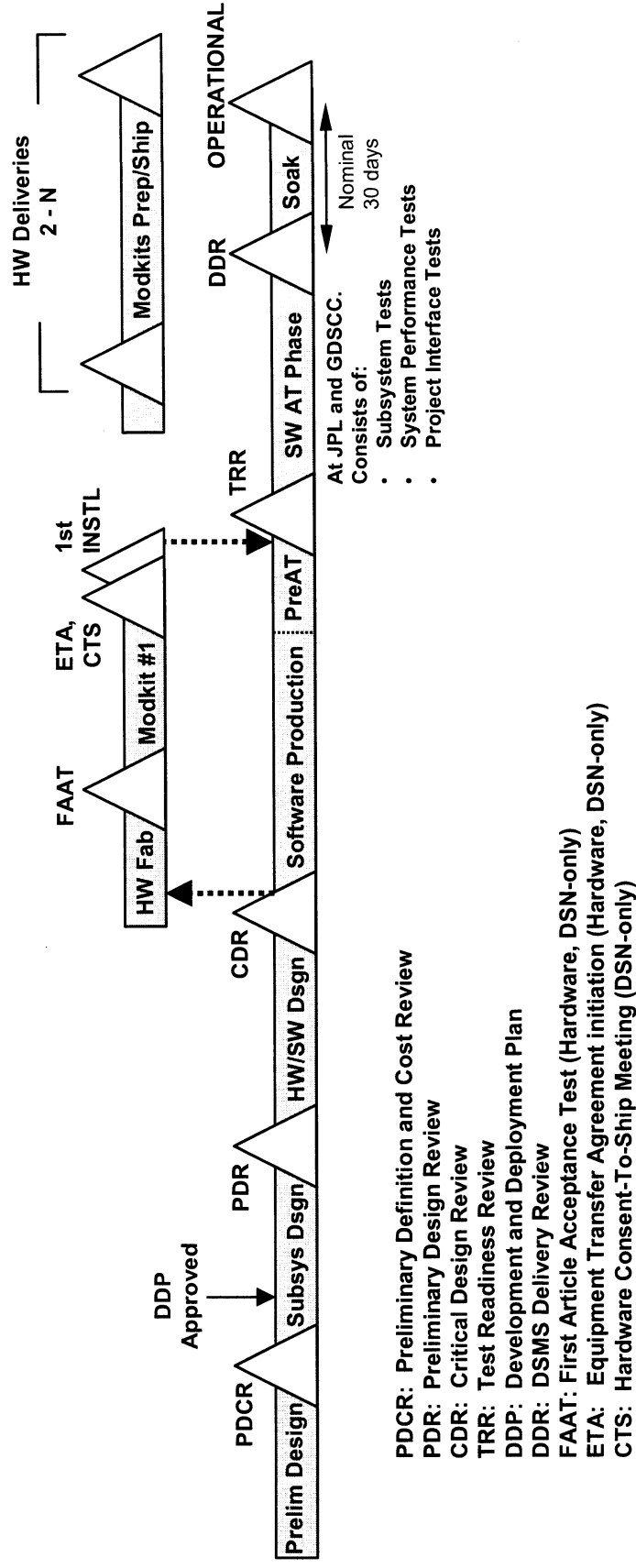
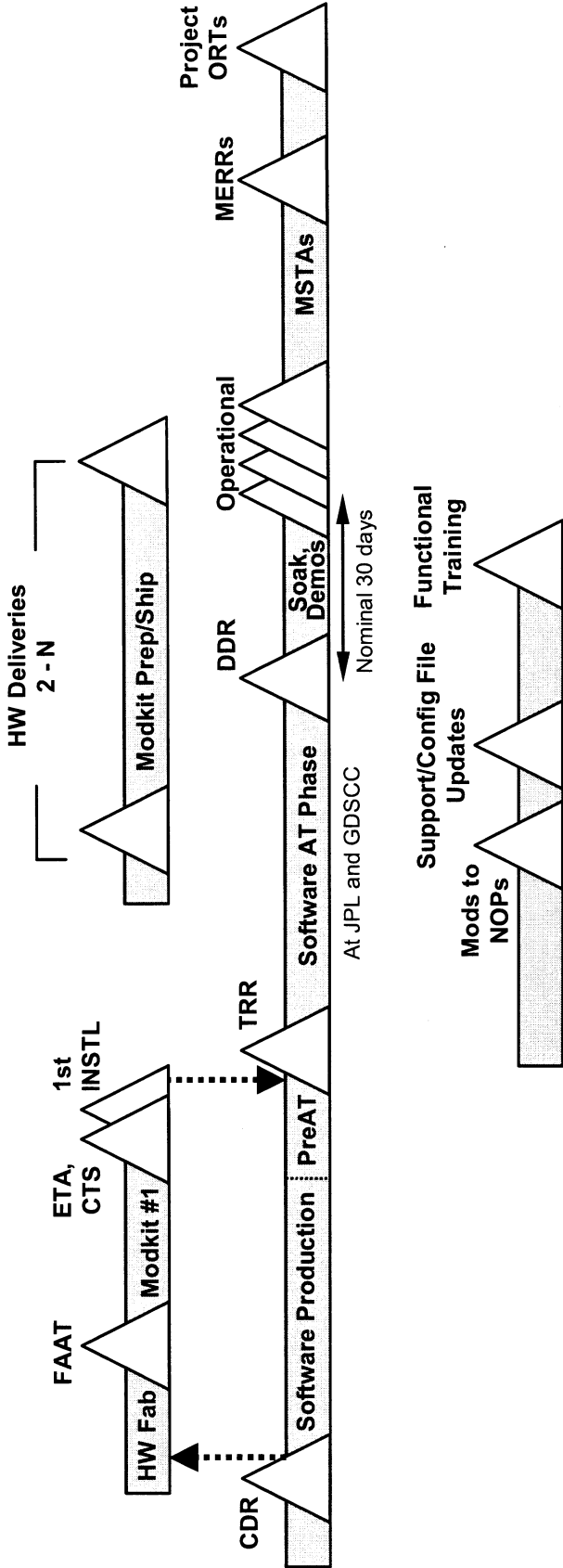


Figure 12-2: SCD Process Timeline for a Simple Case

Process Timeline with SVE additions

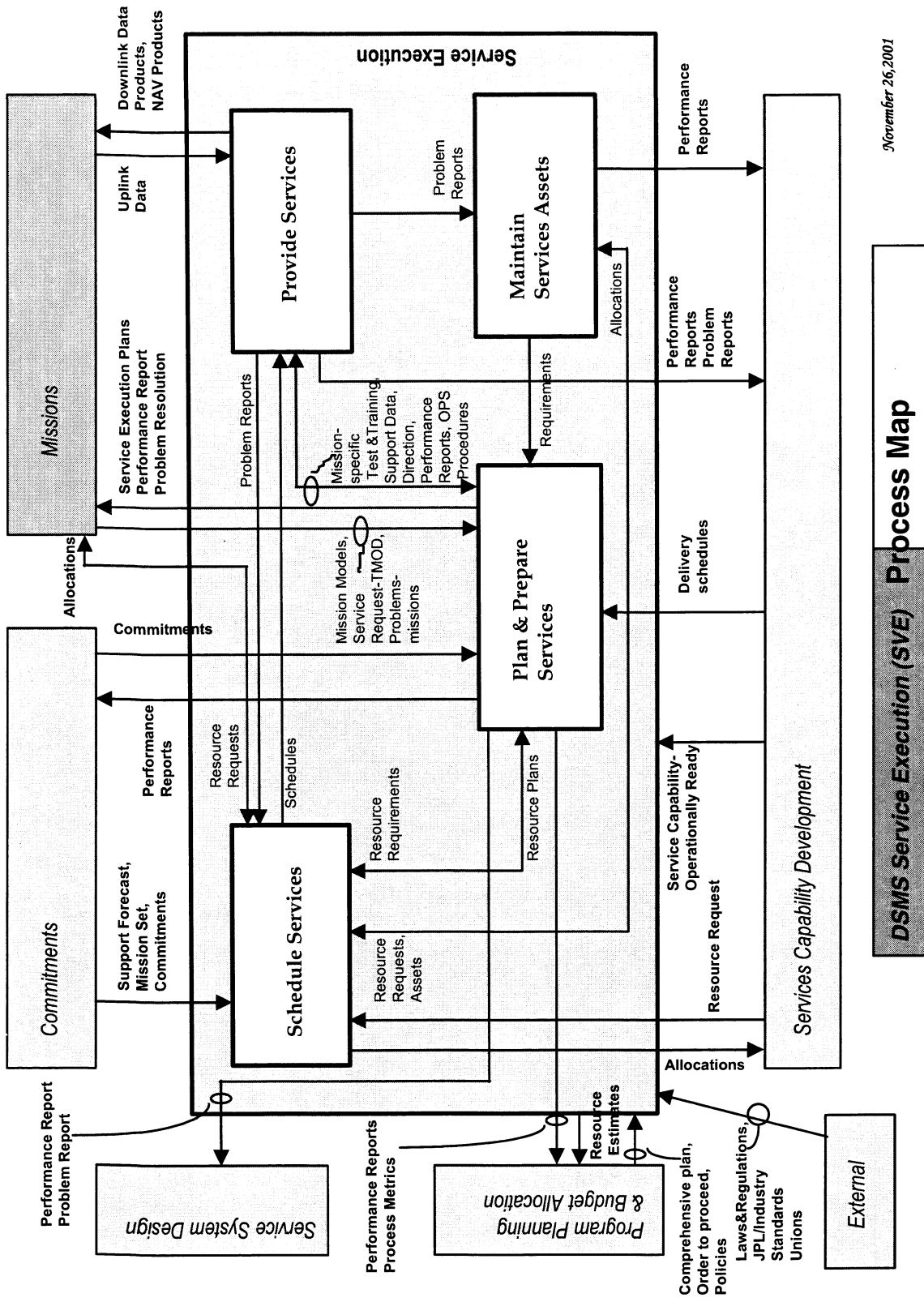


MSTA: Mission Services Training Activity
NOP: Network Operations Plan

Figure 12-3: SCD Process Timeline with SVE additions

13 APPENDIX H: SERVICE EXECUTION PROCESS

Figure 13-1 illustrates the Service Execution Process (SVE). Figure 13-2 shows the inputs, controls, outputs, and resources for this process.



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Figure 13-1: Service Execution Process

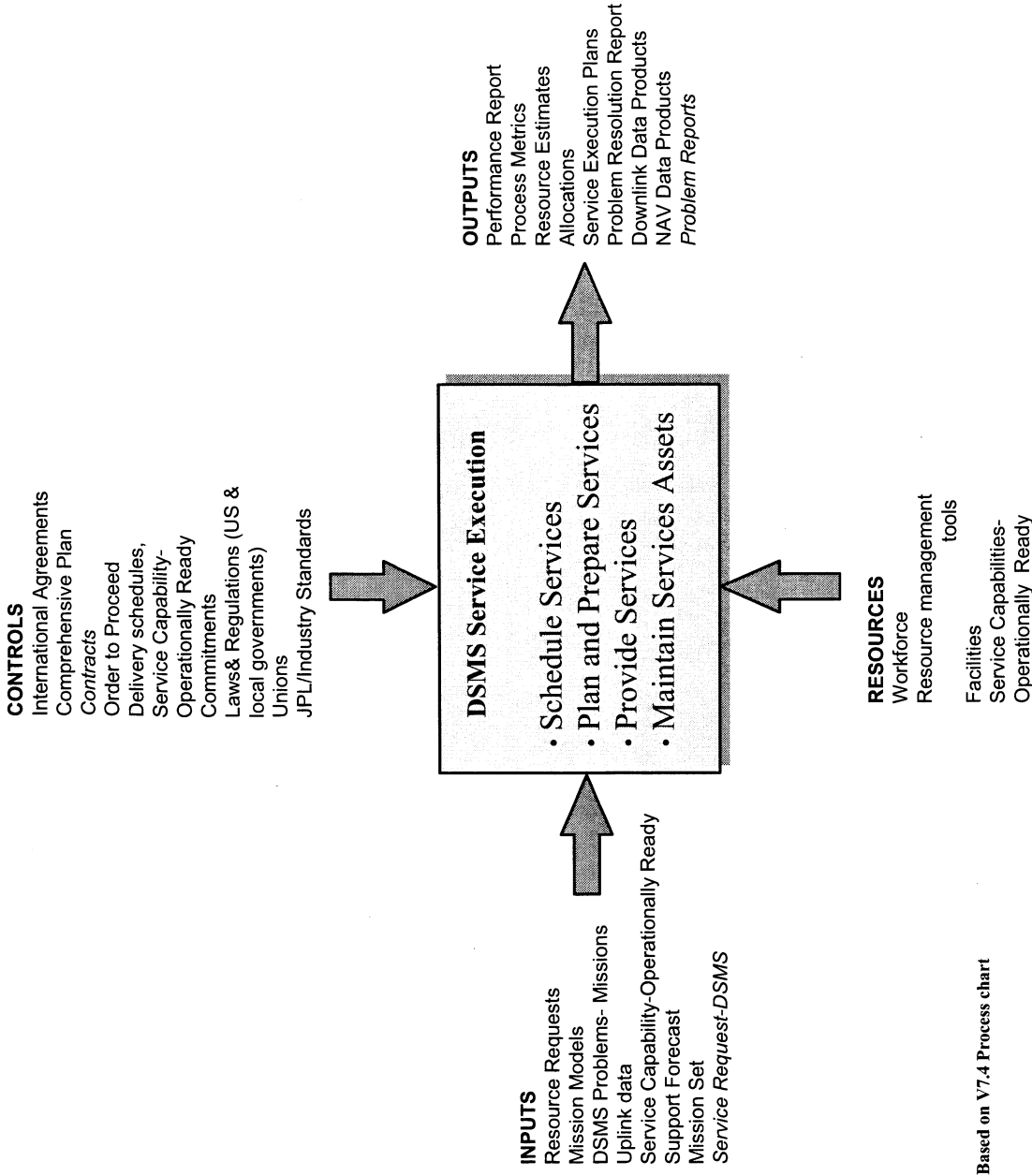


Figure 13-2: SVE Process Inputs, Controls, Outputs, and Resources

14 APPENDIX I: PRODUCT ENGINEERING ASSIGNMENTS

Table 14-1 is a table of product engineering assignments.

Table 14-1: Contractor Product Engineering Responsibility Assignments

			SSE or CDE Responsibility	Sustaining
Number	Abbr	Title	CTR	CTR
101.4	ASP	70m Antenna Support Equipment		
101.401	AAC	Antenna Air Conditioning		
101.402	APL	Antenna Power Distribution and Lighting		
101.403	AFP	Antenna Fire Protection		
101.404	GRN	Antenna Grounding		
101.405	AMS	Antenna Maintenance Support Equipment		
102.4	ASP	26-m Antenna Support Equipment		
101.401	AAC	Antenna Air Conditioning		
102.402		Power Distribution and Lighting (26-m)		
103.4		11m Antenna Support Equipment		
103.401	AAC	Antenna Air Conditioning Group (11m)		
103.402	AFP	Antenna Fire Protection/Monitoring		
104.4	ASP	34-m HSB Antenna Support Equipment		
104.401	AAC	Antenna Air Conditioning (34-m HSB)		
104.402	APL	Antenna Power Distribution and Lighting (34-m HSB)		
104.403	AFP	Antenna Fire Protection		
104.404	GRN	Antenna Grounding		
105.4	ASP	34-m HEF Antenna Support Equipment		
105.401	AAC	Antenna Air Conditioning (34-m HEF)		
105.402	APL	Antenna Power Distribution and Lighting		
105.403	AFP	Antenna Fire Protection		
105.404	GRN	Antenna Grounding		
106.4	ASP	34-m BWG Antenna Support Equipment		
106.401	AAC	Antenna Air Conditioning		
106.402	APL	Antenna Power Distribution and Lighting		
106.403	AFP	Antenna Fire Protection		
106.404	GRN	Antenna Grounding		
111.2		Antenna Calibration Group		
111.201	APCAL	Antenna Pointing Calibration Assembly		
111.202	APCAL	APCAL Boresighting Software		
111.203	APCAL	APCAL Data Analysis Software		
205.2		System Performance Test		
205.202	SPT	SPT Executive Program		
205.203		DSCC Command System Performance Test Software		

Table 14-1: Contractor Product Engineering Responsibility Assignments

			SSE or CDE Responsibility	Sustaining
Number	Abbr	Title	CTR	CTR
205.204		DSCC Tracking System Performance Software		
205.206	SPT2	System Performance Test (Type II)		
205.207	SPT2	System Performance Test (Type II) Software		
209	DTK	DSCC Tracking Subsystem		
209.1		Control		
209.202	MTA	Metric and Tracking Assembly		
209.203	MTA	Metric and Tracking Assembly Software		
209.3		Ranging Group		
209.304	SRI	SRA-to-RER Interface Assembly		
211.203	CMG	Command Modulation Generator		
211.203	CMG	Command Modulation Generator Software		
211.203	CMG	CMG Off-line Diagnostics		
231.1		26m Receive and Demodulate		
231.101	MFR	Multifunction Receiver		
231.102		S-Band Downconverter		
231.103		Receiver-Exciter Test Equipment Group (26-m)		
231.105		26-m RER Slave Controller Software		
231.3		26-m Doppler/Range Group		
231.301		Ranging Firmware (26 m)		
303.1	DMP	26-m Station Link Monitor		
303.101	LMP	Link Monitor Processor Assembly (26 m)		
303.102	LMP	Link Monitor Processor Software (26 m)		
303.2		26-m Station Control		
303.201	MCP	Monitor and Control Processor (26 m)		
303.202	MCP	MCP Applications Software (26 m)		
303.204	RUI	MCP Remote User Interface Software (26 m)		
304.1		SPP Product Services Group		
304.101	SPPA	Support Products Provider Assembly Software		
304.102	SPPA	Support Products Provider Assembly		
304.103		Mission Control Table Generator		
304.104	MCTM	Mission Control Table Manager		
304.105	MCTV	Mission Control Table Viewer		
304.106	TCD	Telemetry and Command Desktop Generator Software		
304.2		SPP User Interface Group		
304.201	NIS26	26-m Network Information Server		
304.202	NIS26	26-m Network Information Server Software		
306.402	MDDS	Monitor Data Dictionary Service		
306.403	UDS	Uniform Display Service		

Table 14-1: Contractor Product Engineering Responsibility Assignments

			SSE or CDE Responsibility	Sustaining
Number	Abbr	Title	CTR	CTR
306.404	CDT	Command Display Terminal		
309	NSS	Network Support Subsystem		
309.1		NSS Processing Environment		
309.101	NSC	NSS Support Computer Assembly		
309.102		NSS Peripheral Switch Assembly		
309.103	RASM	Remote Access Scheduling Mailbox		
309.113		NSS Cables		
309.2		NSS Applications		
309.201	NSC	NOCC Support Controller Software		
309.202	GRAD	Geocentric True of Date RA/DEC Predict		
309.205	RASM	Remote Access Scheduling Mailbox Software		
309.206	NAVIO	NAV I/O Software for NSS		
309.208		NSS Delta-DOR Utility		
309.209	DFPO	Downlink Frequency Predicts Offset Utility		
313.2		Applications		
313.201	NIMS	Network Information Management		
313.9		Maintenance Logistics Support Group		
313.901		Processing Equipment		
313.902	MAXIMO	RCM Application Software (MAXIMO)		
314.101	ECM	Engineering Change Management		
314.104	SPMC	Software Production Management and Control		
314.201	DOSL	DSN on-line Software Library		
314.202	DOSL	DSN on-line Software Library Software		
321.1		Central Transmission Group		
321.101	CTX	Central Transmission Assembly		
321.102	CCS	Central Communications Switching Assembly		
321.103	CDC	Central Digital Communications Assembly		
321.2		Station Transmission Group		
321.202	FOA	Fiber Optic Assembly		
321.203	STX	Station Transmission Assembly		
321.204	SDC	Station Digital Communications Assembly		
321.206	SCS	Station Communications Switching Assembly		
321.213		Station GTX Cables		
321.3		Remote Site Group		
321.301	EXT	External Transmission Assembly		
321.4		NISN-Provided Equipment Group		
321.401	NTX	NASCOM Transmission Assembly		
321.402	BPIPE	Primary DSCC Communications Channel		

Table 14-1: Contractor Product Engineering Responsibility Assignments

			SSE or CDE Responsibility	Sustaining
Number	Abbr	Title	CTR	CTR
321.403	LPIPE	Secondary DSCC Communications Channel		
322.1		Central Voice Group		
322.101	CDS	Central Distribution Assembly		
322.102	CVS	Central Voice Switching Assembly		
322.103	CVT	Central Voice Terminal		
322.2		Station Voice Group		
322.201	SVS2	Station Voice Switch II		
322.202	SVT	Station Voice Terminal		
322.207	SVS2	Station Voice Switch-II Software		
322.3		Remote Site Voice Equipment Group		
322.301	EVA	External Voice Assembly		
322.302	EVT	External Voice Terminal Assembly		
322.303	EVS	External Voice Switch Assembly		
322.304	RVE	Remote Voice Equipment (DTF-21)		
401	FAC	Technical Facilities Subsystem		
401.1		DSCC Infrastructure		
401.101	CVL	Civil/Structural Analysis Group		
401.102	ACG	Air Conditioning Group		
401.103	GRG	Grounding Group		
401.2		Control and Monitor Group		
401.201	TFM	Technical Facilities Monitoring Assembly		
401.3		Site Security		
401.301	SPS	Site Protection System		
401.302	FLG	Facilities Lighting Group		
401.303	TVA	TV Assembly		
401.4		Interfacility Cabling Group		
401.401	ACB	Antenna-SPC Cable Backbone		
401.5		Chemical Storage		
401.501	NSA	Nitrogen Supply Assembly		
402	DPS	Power Subsystem		
402.1		Power Subsystem Control		
402.101	PSC	Power Subsystem Controller		
402.102	PSM	Power System Monitor		
402.2	PGG	Power Generation		
402.3	PDG	Power Distribution		
402.4	UPS	Uninterruptible Power Supply		
404	CRC	Control Room Configurations		
404.1		NOCC/GCF-20 Equipment Arrangements		

Table 14-1: Contractor Product Engineering Responsibility Assignments

			SSE or CDE Responsibility	Sustaining
Number	Abbr	Title	CTR	CTR
404.2	GDSCC	DSCC-10		
404.3	CDSCC	DSCC-40		
404.4	MDSCC	DSCC-60		
404.5	DTF-21	Development Test Facility-21		
404.6	CTT-22	Compatibility Test Trailer-22		
404.7	ECC	Emergency Control Center		
404.8	MIL-71	MIL-71		
405	SCD	Facility System Cable Documentation		
406		DSN Standard Hardware		
406.1	STDCAB	Standard DSN Cabinets		
406.2	STDCBL	Standard DSN Cables		

Table 15-1 cross-references by WBS element number the Contractor staff roles cited in the task descriptions.

Table 15-1: Staff Roles Referenced by WBS Element Number		
WBS no.	Role name	The Contractor staff filling this role shall:
1.1.3 1.1.4 2.1.3	Certified Safety Professional	Maintains all Cal/OSHA-required record keeping and documentation. Ensures issuance and maintains safety oversight of the required qualifications and certifications for all operators of heavy equipment. Maintains Cal/OSHA certifications, requirements, and testing record keeping and documentation for all antenna hoists and cranes, pressure vessels/systems, electrical systems, radio frequency equipment, lasers, and any other equipment per Cal/OSHA requirements.
1.8	Performance Metrics Analyst	Possess knowledge of basic DSN architecture and operations, statistical methods, data collection, manipulation, analysis, and trend identification.
2.1.1	RF Coordination Manager	Have a SECRET clearance and in-depth knowledge of radio frequency theory.
2.1.4	Registered Environmental Assessor	Registered Environmental Assessor in the State of California
2.1.9	Outreach Coordinator	Be experienced in communicating the capabilities of the Deep Space Network in tracking NASA missions. Be knowledgeable about the missions, their destinations, and science goals. Be flexible in the presentation of such information to interact with all grades of students, teachers, and other educators, in addition to the public and members of the scientific and technical community, and be able to convey they information in a manner appropriate to their level of understanding. Represent the GDSCS by giving presentations on NASA's scientific discoveries and technological achievements to local community groups, students, and local leaders, especially, but not restricted to, the Barstow School District and the Barstow City area. Represent Goldstone at any Fort Irwin sponsored events where the outreach program is a significant addition and appropriate; i.e., Safety Days and environmental events. Support local museums, libraries, and similar organizations by providing materials or information to allow them to accurately represent Goldstone and the DSN in their exhibits. Report directly to the JPL Task Manager.

Table 15-1: Staff Roles Referenced by WBS Element Number

WBS no.	Role name	The Contractor staff filling this role shall:
2.3.1	Antenna Maintenance Personnel	<p>Be able to measure the thickness of the thermal coating to determine if it has been applied per the specification. They shall also be able to use the required tools to repair any damaged or thinned areas on the structure.</p> <p>Be able to determine the condition of a bolted connection by either testing the bolt torque or the visual appearance of the hardware itself. To conduct such tests, they shall be able to use of hand tools, torque wrenches, and hydraulic torque equipment.</p> <p>Ensure that antenna maintenance personnel, welding on the antenna are certified per DSN-STD-1015. Maintenance personnel shall know the inspection techniques and equipment used for the inspection of structural welds.</p> <p>Ensure that antenna maintenance personnel can read detail drawings to determine whether a structural member has shifted in any direction. They shall also be able to use measurement equipment to determine material thickness.</p> <p>Be able to operate heavy equipment including forklifts and hoists. They shall also be trained in the proper way to rig structural members for hoisting. They shall be qualified in fall protection and the operation of man-lifts.</p> <p>Maintenance personnel shall know how to determine whether concrete is in good condition. To aid in this determination, they shall know how to place and inspect concrete. They shall be able to place grout per design drawings and procedure requirements.</p>
2.6.1	Complex Research and Development Engineer (CRDE).	<p>Be responsible for the DSCC on-site R&D configuration management, coordination, and training.</p> <p>Support administration and coordination of GDSCC R&D activities sponsored by the Technology Office and the DSN Science Office.</p> <p>Provide general advisory support to DSCC operations.</p> <p>Provide direct support for R&D activities, and for special mission support as required.</p> <p>Provide status, control of technical, and logistics resources needed for R&D activities.</p> <p>Provide coordination and maintenance of R&D equipment, maintenance of the R&D interfaces with Operational equipment, calibration required for R&D equipment, and end-to-end data system validation and/or SPT prior to experiments.</p> <p>Manage local documentation of R&D equipment configuration and local procurement of R&D equipment</p>
2.6.1	Complex Research and Development Engineer (CRDE)	<p>Work directly with, and functionally report to, the Interplanetary Networks Direct (IND) R&D Project Element Manager (PEM).</p> <p>Be responsible for DSCC on-site R&D configuration management, coordination, and training in support of advanced development activities.</p>

Table 15-1: Staff Roles Referenced by WBS Element Number

WBS no.	Role name	The Contractor staff filling this role shall:
		<p>Administer and coordinate support for GDSCC R&D activities sponsored by the Technology Office and the DSN Science Office.</p> <p>Provide general advisory support to DSCC operations on scheduled R&D activities.</p> <p>Provide direct support for R&D activities, and for special mission support as required.</p> <p>Provide status and control of technical and logistics resources needed for R&D activities.</p> <p>Coordinate maintenance of R&D equipment, maintenance of the R&D interfaces with Operational equipment, R&D equipment calibration, and end-to-end data system validation and/or SPT prior to experiments.</p> <p>Manage GDSCC documentation of R&D equipment configuration and local procurement of R&D equipment.</p> <p>Ideally, possess an MS degree in Physics, Astronomy, or Electrical Engineering. PhD is preferred.</p>
2.6.2	HPTTF Staff	Training, experience, and certification in microwave transmitters and their related subsystems
2.6.2	HPTTF Staff: Electronics Specialist	<p>Twenty years design and practical experience with high-power transmitters ranging from under 1 kW to over 500 kW continuous wave and from S-band to X-band.</p> <p>Management experience in the operation of a high-power test facility.</p> <p>Relevant bachelor's degree desired. About two years of additional training will be required by JPL.</p>
2.6.2	HPTTF Staff: Mechanical Specialist	<p>Ten years experience as a general machinist with at least five of those years as a computer numerical control (CNC) machinist/programmer.</p> <p>Certification for operating Fadal-type CNC.</p> <p>Ability to design with mechanical design and CAD packages such as Solid Works, Pro E, Autocad, and Virtual Gibbs.</p> <p>State-certified welding certificate (general steel—architectural).</p>
2.7.4	Packaging Specialist	Be certified, as required, especially for the handling and packaging of hazardous materials and be thoroughly trained in proper techniques, processes and procedures.
4.1.2.1	Structural Engineer	<p>Ensure conformance with the rules and regulations of the national standards for structural assemblies, materials, and welding codes.</p> <p>Be responsible for evaluating the condition of the structural assemblies on the antenna and for developing all rework/repair operations for its components.</p> <p>Monitor maintenance activities and the installation of all additions to the structural assembly.</p> <p>Review the analysis data and design drawings developed by the design-engineering group, for any proposed modifications to the structural assembly.</p>

Table 15-1: Staff Roles Referenced by WBS Element Number

WBS no.	Role name	The Contractor staff filling this role shall:
		<p>Develop the lift plans for the removal or installation of new members.</p> <p>Provide general DSN Engineering support as described in Section 4.1, as appropriate</p>
4.1.2.2	Mechanical Engineer	<p>Conform to the rules and regulations of the national standards for mechanical assemblies and their design.</p> <p>Be responsible for evaluating the condition of the mechanical assemblies on the antenna including the alignments of the gear reducers, condition of the hydraulic and electric drives, condition of all rotating assemblies, and the operational status of the hydrostatic bearing assembly.</p> <p>Develop all installation, rework, and alignment procedures for the maintenance activities on all mechanical assemblies.</p> <p>Review the analysis data and design drawings developed by the design-Engineering group for any proposed modifications to the mechanical assembly.</p> <p>Monitor the condition of the hardware by analyzing the predictive and preventive maintenance reports generated by the maintenance personnel at the stations.</p> <p>Be responsible for keeping track of the availability of replacement hardware.</p> <p>Provide general DSN Engineering support as described in Section 4.1, as appropriate</p>
4.1.2.3	Cassegrain Assembly Engineer	<p>Conform to the rules and regulations of the national standards for mechanical assemblies and their design, materials, and coatings.</p> <p>Develop new procedures used for maintenance activities for the handling and alignments of the reflective structure, subreflector assembly, and mirrors.</p> <p>Analyze antenna performance reports and determines the condition of the cassegrain assembly.</p> <p>Review the analysis data and design drawings developed by the design-Engineering group for any proposed modifications to the cassegrain assembly.</p> <p>Monitor the condition of the hardware by analyzing the predictive and preventive maintenance reports generated by the maintenance personnel at the stations.</p> <p>Provide general DSN Engineering support as described in Section 4.1, as appropriate</p>
4.1.2.4	Special Tooling & Instrumentation Engineer	<p>Design any mechanical equipment needed for the repair, replacement, and alignment of antenna hardware.</p> <p>Monitor the condition of the hydrostatic bearing instrumentation (HBI).</p> <p>Develop any instrumentation that could be used for maintenance activities, and monitoring of antenna components.</p> <p>Review all maintenance records, predictive/preventative reports, and inspection reports submitted by the stations and compile a monthly report on the findings listing any</p>

Table 15-1: Staff Roles Referenced by WBS Element Number

WBS no.	Role name	The Contractor staff filling this role shall:
		<p>concerns. This report shall be delivered to the Program Office.</p> <p>Review the monthly report on the shimming activities on the 70-meter antenna hydrostatic bearing and generate a report on the condition of the runner. This report shall be delivered to the Program Office.</p> <p>Monitor the status of spares at each station and their availability and generate a quarterly. This report shall be delivered to the Program Office.</p> <p>Provide general DSN Engineering support as described in Section 4.1, as appropriate.</p>
4.1.6	Hardware & Software Test Engineers	<p>Be familiar with industry-standard or IEEE hardware and/or software development and test processes</p> <p>Be versed in test methodologies and theory, and in the fundamentals of design and operations for hardware and/or software (as appropriate to the task).</p>
4.2	Facilities Design Engineer	<p>Possess Architect, Engineer, or equivalent technical education and experience.</p> <p>Function as the Design Engineer for DSCC Facilities.</p> <p>Provide support in the design and construction of facilities systems, and master planning of the DSCC facilities.</p> <p>Support the DSN CoF Program Office.</p>
4.2	Electrical Engineer(s)	<p>Provide support in the design, fabrication, assembly, test and implementation of power distribution, lighting, and grounding systems.</p> <p>At least one Electrical Engineer shall hold current registration as a California registered professional Engineer.</p>
4.2	Mechanical Engineer(s)	<p>Provide support in the design, fabrication, assembly, test, and implementation of HVAC systems and their associated controls, fire suppression and detection systems, and gaseous nitrogen systems.</p>
4.2	Civil Engineer(s)	<p>Provide support in analysis, design, fabrication, assembly, test, and implementation of civil works and structures.</p> <p>At least one Civil Engineer shall hold current registration as a California registered Professional Engineer.</p>
4.2	Designer(s)	<p>Be skilled in the use of AutoCAD design software of release 14 or newer.</p> <p>Possess a minimum of ten (10) years of experience in the design of facilities projects.</p>
4.2	GIS Specialist(s)	<p>Be knowledgeable about the application of the Geographical Information System (GIS), about NASA's use of this tool as related to facilities Engineering, and about NASA's SPECSINTACT System.</p>
4.2.1.2	Cognizant Design Engineer	<p>Perform design of all facilities and antenna support equipment for maintainability and sustainability.</p> <p>Develop requirements and support associated facilities and</p>

Table 15-1: Staff Roles Referenced by WBS Element Number

WBS no.	Role name	The Contractor staff filling this role shall:
		<p>antenna support equipment functional requirements documents, reviews and construction pre-advertisement reviews as required.</p> <p>Provide input for new facility site locating.</p> <p>Utilize NASA best practices such as Pre-Project Planning and risk management.</p> <p>Support development of facility concept studies as required.</p> <p>Develop requirements selection of A&E services and for input to JPL A&E Selection Board.</p> <p>Provide oversight of facility construction activities and construction contracting. Perform construction project management, develop and execute Facility Activation Plans for all new construction and facility modifications.</p> <p>Perform Project Definition Rating Index (PDRI) assessment and generate PDRI scores for CoF related facility and antenna support equipment projects.</p> <p>Request Authority to Advertise from DSN CoF Program Office for CoF related projects.</p> <p>Prepare and submit Flash Bid Reports as required.</p> <p>Utilize Specifications-Kept-Intact (SPECSINTACT) System for generation of statements of work for CoF projects.</p> <p>Interface with Operations and Maintenance personnel, users, other subsystems to ensure coordination with other DSN subsystems and assemblies.</p> <p>Provide for final acceptance and activation of installed systems.</p> <p>Support Facilities SSE in all aspects of Facilities and Antenna Support Equipment Systems as necessary to ensure DSCC mission readiness.</p> <p>Generate new and update antenna support equipment and facilities related documents, interface agreements, drawings, specifications, functional requirements documents, schedules, and plans as needed.</p> <p>Hold current registration as a California registered professional Engineer.</p>
4.2.1.2	Subsystem Engineer	Supply an Architect, Engineer or equivalent with technical education and experience to function as the Subsystem Engineer for DSCC Facilities and to provide support in the design and construction of facilities systems, master planning of the DSCC facilities and to support the DSN CoF Program Office.
4.2.1.2	Electrical Engineer	Supply an Electrical Engineer(s) to provide support in the design, fabrication, assembly, test and implementation of power distribution, lighting, and grounding systems. At least one Electrical Engineer shall hold current registration as a California registered professional Engineer.
4.2.1.2	Mechanical Engineer	Supply a Mechanical Engineer(s) to provide support in the design, fabrication, assembly, test and implementation of HVAC systems and their associated controls; fire

Table 15-1: Staff Roles Referenced by WBS Element Number

WBS no.	Role name	The Contractor staff filling this role shall:
		suppression and detection systems and gaseous nitrogen systems.
4.2.1.2	Civil Engineer	Supply a Civil Engineer(s) to provide support in analysis, design, fabrication, assembly, test and implementation of civil works and structures. At least one Civil Engineer shall hold current registration as a California registered professional Engineer.
4.2.1.2	Designer	Supply a Designer(s) and drafter(s) skilled in the use of AutoCAD design software of release 14 or newer. The designers shall have a minimum of ten (10) years experience in the design of facilities projects.
4.2.1.2	GIS Expert	Provide at least one person knowledgeable in the application of the Geographical Information System (GIS) and NASA's use of this tool as related to facilities Engineering and NASA's SPECSINTACT System.

