SECTION J

LIST OF ATTACHMENTS

Attachment	Title
J-1-A	Statement of Work for 6th Buy External Tank - Production
J-2-A	Make or Buy Plan - Production
J-3-A	Small/Small Disadvantaged & Women Owned Small Business - Subcontracting Plan
J-4-A	Government-Furnished Facilities, Property and Services - Production
J-5-A	External Tank Fee Plan – Production
J-6-A	Statement of Work for Space Shuttle System Integration Support - Production
J-7-A	Delivery Schedule
J-8-A	Provisioning Procedure for External Tank Spare Parts
J-9-A	External Tank Launch Support Services (KSC)
J-10-A	External Tank Flight Operations
J-11-A	Technology Utilization/Transfer Program
J-12-A	Post DD250 Requirements for External Tanks Manufactured Under Contract NAS8-36200

Attachment	Title
J-1-B	Statement of Work for the MAF Operations and Maintenance
J-2-B	Make or Buy Plan – MAF Operations and Maintenance
J-3-B	Small/Small Disadvantaged & Women Owned Small Business - Subcontracting Plan
J-4-B	Government-Furnished Facilities, Property and Services - MAF Operations and Maintenance
J-5-B	MAF Operations and Maintenance Fee Plan
J-6-B	Statement of Work for Space Shuttle System Integration Support - MAF Operations and Maintenance
J-7-B	Energy Cost Reduction Program

Attachment	Title
J-1-C	Statement of Work for 6th Buy External Tank – Flight Hardware
J-2-C	Make or Buy Plan – Flight Hardware
J-3-C	Small/Small Disadvantaged Small Business Subcontracting Plan – Flight Hardware
J-4-C	Government-Furnished Facilities, Property and Services – Flight Hardware
J-5-C	External Tank Fee Plan – Flight Hardware
J-1-D	Statement of Work for Shuttle Upgrades
J-2-D	Reserved
J-3-D	Small/Small Disadvantaged & Women Owned Small Business - Subcontracting Plan
J-4-D	Government-Furnished Facilities, Property and Services – Shuttle Upgrades
J-5-D	Shuttle Upgrades Fee Plan

ATTACHMENT J-1-A
STATEMENT OF WORK
FOR 6th BUY EXTERNAL TANK
PRODUCTION

1.0 INTRODUCTION

The primary objective of the Space Shuttle Program is to provide an economic space transportation system that will support a wide range of scientific and commercial applications in earth orbit. Primary focus is on flying safely, meeting the manifest, mission supportability, and system improvements to reduce costs. The major elements of the Space Shuttle Program are the Orbiter, Reusable Solid Rocket Motors (RSRM), External Tank (ET), Solid Rocket Booster (SRB), and Space Shuttle Main Engine (SSME).

1.1 This statement of work details the requirements for the production of thirty-five (35) External Tanks (ET-122 through ET-156), and the required production support activities.

2.0 REQUIREMENTS

2.1 The contractor will provide the effort required to maintain and store the program agreed to ship-set of unique Lightweight (LWT) hardware procured under Contract NAS8-36200. Parts/hardware will be secured and stored at MAF and maintained to the procured design configuration. The hardware described above is provided to the contractor as Government Furnished Property and included in Attachment J-4-A hereto.

2.2 Production - Defines the requirements for the manufacturing, assembly, test, checkout, and delivery of 35 operational flight articles in order to meet the delivery schedule established in Attachment J-7-A of this contract. These requirements cover all effort to include tooling, equipment, hardware, facilities, services, materials (i.e. Scrap and Rework, Consumables and Expendables, and Test Panels), and management (except as specified to be provided by the Government) for the delivery of 35 External Tanks baselined as follows:

2.2.1 Thirty-five (35) External Tanks (ET-122 through ET-156) identified as Super Lightweight External Tanks (SLWT) as baselined by the addition of Appendix 40 to MMC-ET-CM02 End Item Specification CPT01M09A.

2.3 The period of performance of the production of ET-122 through ET-156 as well as the production support activities at MAF begins September 27, 1999 and continues through December 1, 2008.

2.4 The contractor has been provided Government Furnished Property (GFP) Tooling for a production rate of 10 tanks per year. This GFP Tooling is included in Attachment J-4-A hereto.

2.5 Separate contractual action will be required for factory modifications and modification kits for field installation in support of delivered hardware.

2.6 The Space Shuttle Program (SSP) Industrial Engineering for Safety (IES) Initiatives have been established by the SSP Manager to improve the maintainability of SSP hardware. The specific goals are to reduce risk to the workforce, reduce the risk of collateral hardware damage, and increase maintainability. This is a very specific application of industrial engineering techniques to identify and implement changes, which will improve the safety of people and hardware, as opposed to a pure Industrial Engineering (IE) initiative to improve overall processing cost and efficiency. The following initiative(s) have been identified as IES Initiatives:

2.6.1 Ergonomic Study with Mississippi State University - To perform an ergonomics evaluation of various aspects of External Tank (ET) manufacturing operations. A Mississippi State University research team will perform an ergonomics evaluation of the Mechanical Assembly, Electrical Harness Line and SOFI Components Shop for the ET Program at the Michoud Assembly Facility (MAF) in New Orleans, Louisiana.

2.6.2 Improvements to Weld Tools – Improve the following weld tools as identified in PCP B81580A and B81580B. 1) OSL Weld Access Platforms, Tool T05A5015 and T03A5024, 2) Ogive Weld Tool Access Platforms, Tool T03A5012, 3) Crane System for Cap Weld Tool, Tool T05A5025, 4) Permanent Observation Platform for LO2 Tank Welds, Tool T05A5018, 5) Permanent Platform for Drive Ring Installation, Tool T05A5069, 6) Internal Baffle Adaptor Tool, LO2 Tank Major Weld Fixture Rim Drive, and 7) Upgrade Controls on Final Assembly Cranes 6, 7, 20, 86, 87 and C18.

2.6.3 Enhanced Intertank Access Scaffolding and Platforms – Replace the Intertank Scaffolding (internal) and the LH2 Final Assembly Access Platform (external). These two platforms will be replaced with redesigned platforms made of composite material, which will better protect flight hardware and personnel as well as decrease the risk of collateral damage.

2.6.4 Improved Top of Tank Access in Final Assembly- Provide an access platform to and from the top of the External Tank during horizontal final assembly operations as identified in PCP B81580D.

2.6.5 Implementation of Ergonomic Study Items- Implement various recommendations defined in the ergonomic study conducted by Mississippi State University including: crimping devices, workstations and chairs, anti-fatigue devices, enhanced/supplemental lighting and conveyance devices within the harness fabrication shop and TPS (SOFI) areas.

2.7 Paperless Manufacturing Execution System - The contractor will implement a Paperless Manufacturing Execution System (PMES) as identified in the PCP B81694B and PCP B81694C. This effort will include implementation of electronic work instructions, electronic documentation of non-conformances, and management of the associated data. Equipment required for implementation of this effort is defined under Contract NAS8-39243(F) , PCP B81694D.

(End of clause)

2.8 The Contractor shall procure amounts of HCFC 141b sufficient to meet External Tank requirements as identified in Project Change Proposal B81707-R1. This requirement is contingent upon market availability. The Government assumes responsibility for providing useable material in support of contract requirements. Should any of the material become unusable as a result of events not attributable to the Contractor, to include but not limited to shelf-life expiration, environmental impacts or contamination, the resulting impacts will be the subject of equitable adjustment to the Contract. Beginning in calendar year 2004, the Contractor will conduct semi-annual analysis and reporting on HCFC 141b stability.

3.0 INDEX OF COMPLIANCE SPECIFICATION, DOCUMENTS AND DEVIATIONS

Listed below are the Type I documents applicable to this contract Statement of Work. Any references to these documents throughout this Statement of Work shall be deemed to be in accordance with the issue date and/or revision set forth in this index. The documents identified herein are listed for configuration or requirements identification purposes only. Hardware modifications to the items procured herein will be enabled pursuant to the clause of this contract entitled "Changes -- Cost Reimbursement -- Alternate V".

3.1 Specifications

Document Number	Title and Date
MMC-ET-CMO2a (CPTO1MO9A) Part I	Prime Equipment Detail Specification, Part I of two parts, Performance Design and Verification Requirements, External Tank (LWT-1 and Subs) (CEI No. T01M09A) for Space Shuttle Program, dated April 9, 1980,through SCN 428 (July 9, 1999)
MMC-ET-CMO2a (CPTO1M09A) Part II	Prime Equipment Detail Specification, Part II of two parts, External Tank (CEI No. T01M09A) for Space Shuttle Program, dated May 3, 1983, through SCN 068 (July 9, 1999).
MMC-ET-CM13-0 (A) (CPT02M26A)	Basic ET Contract End Item Specification (CEI) for Ground Umbilical Carrier Plate Assembly dated January 16, 1976 through SCN 034 dated March 5, 1996

NOTE: Subsequent applicable Specification Change Notices (SCNs) shall be listed in the appropriate Specification Change Log Number Reference incorporated herein by reference.

3.2 Contractor Documents*

Document Number	Title and Date
MMC-ET-CM01-B	External Tank Project, Configuration Management Plan, dated April 29, 1983, through DCN 067R-1 dated June 7, 1999
LMC-ET-MA91	Facilities Operating Plan dated March 15, 2000
MMC-ET-RA03-C	External Tank Project, Safety, Reliability and Quality Requirements and Implementation Document, dated January 24, 1980, through DCN 026 dated June 9, 1999.
MMC-ET-RA05-F	Failure Modes Effects Analysis (FMEA) Procedure, dated July 21, 1997.
MMC-RA12-B	Contamination Control Plan, dated May, 1986, through DCN 023 dated May 1, 1996.
MMC-ET-SE13-D	Space Shuttle External Tank, Fracture Control Requirements and Implementation Document, dated December 1998.
MMC-ET-SE16-F	External Tank Project Material and Processes Plan, dated October 15, 1993 through DCN 022 dated August 31, 1998.
MMC-ET-SE16(A-1)-N	Approved Material List, Addendum 1 to Materials and Processes Control Plan dated July 31, 1998.
MMC-ET-SE16(A-2)-R	Approved Processes List, Addendum 2 to Materials and Processes Control Plan dated July 31, 1998.
MMC-ET-SE42-C	Long Term Storage Requirements dated April 4, 1988 through DCN 015 dated April 21, 1999.
MMC-ET-TM01-1-C	External Tank Verification Plan, dated June 22, 1988 through DCN 069 dated April 13, 1999.
MMC-ET-TM04k-B	External Tank Acceptance Requirements, dated September 7, 1982, through RCN 008, Amendment 4 dated August 21, 1998.

*Subsequent applicable Document Change Notices (DCNs) shall be listed in the appropriate Documentation Change Log Number Reference, incorporated herein by reference.

3.3 Requirement Documents - The NASA Requirements Documents listed below are identified for reference only. The contractor's implementation of these Requirements Documents, as well as, NASA authorized deviations and exceptions thereto are contained in the Type I documents identified in the above paragraphs 3.1.and 3.2 of this contract.

Document Number	Title and Date
CM-017-015-2H	External Tank Interface Control Documentation Contractual Index and Status Report (Latest Issue).
CM-017-019-2H	External Tank Configuration Identification Index and Modification Status Report (Latest Issue).
DPD 660	Space Shuttle External Tank Information Requirements Document (IRD)
JSC 10780	Space Transportation System Flight Requirements Rev. D. Change 1 Document Space Shuttle Orbital Flight Test (STS-1); dated March 1981
NHB 1620.3	NASA Security Handbook
NPD 8621.1G	NASA Mishaps Reporting and Investigating Policy
MPG 1700.1	MSFC Industrial Safety Procedures and Guidelines
NPG 6000.1E	Requirements for Packaging, Handling and Transportation for Aeronautical and Space Shuttle Equipment and Associated Components
NSTS 5300.4 (1D-2)	"Safety, Reliability, Maintainability and Quality Provisions for the National Space Transportation System Program"
NSTS 07700	Space Shuttle Flight and Ground System Vol. X Specification
NSTS 07700	Space Shuttle Integrated Logistics Requirements, Volume XII.
NSTS 07700	Configuration Management Requirements, Volume IV, Book 1, Requirements
NSTS 08171	Operations and Maintenance Requirements and Specifications Documents.
NSTS 16007	Launch Commit Criteria and Background Document, Appendix F

MSFC-PLN-1228-C Operational Space Shuttle Evaluation Plan dated April 20, 1993.

4.0 PROJECT MANAGEMENT

The contractor will perform those activities to meet the External Tank objectives. These activities include Performance Management and Administration, Information Systems, Procurement Management and Safety, Reliability and Quality Assurance.

4.1 Performance Management and Administration

4.1.1 The contractor will provide an Earned Value Management system traceable to the Work Breakdown Structure. To support this system, the contractor will provide integrated planning, scheduling, budgeting, work authorization, and cost accumulation activities required to maintain the cost management systems for the tasks identified in this Statement of Work.

4.1.2 The contractor will provide the necessary controls to include the establishment of command media, and reports necessary for the overall management of the External Tank Project. These controls will address such things as systems audits, administration of manpower, training of personnel, and provisioning of motivation programs.

4.1.3 The contractor will develop program performance measurement criteria, analyze and summarize measurement data, identify problems, recommend solutions, and track problem resolutions.

4.1.4 The contractor will operate a Configuration Management System in accordance with the NASA Approved Configuration Management plan, MMC-ET-CM01, providing for both programmatic and configuration change control.

4.1.4.1 The contractor will provide configuration management support required to maintain the ET design and performance requirements baseline and the associated safety, reliability, quality assurance, production engineering, process planning and tooling documentation which represents the production requirements baseline for ET-122 through ET-156.

4.1.4.2 The contractor will maintain the configuration baseline for ET-122 and subsequent effectivities by evaluating the impact of proposed changes and preparing and processing change proposals necessary to document these impacts for subsequent Government disposition.

4.1.5 The contractor will furnish information in accordance with the requirements of Data Procurement Document DPD 660. This includes the overall management process as well as the activities required for proper information control (i.e. ensure information is compatible, available and current). The contractor will identify, control, and monitor the preparation of as well as reproduce, distribute and maintain the status of internal and deliverable documentation for the External Tank Project. These requirements will be compiled and maintained in a data management plan. The contractor will acquire and control data from Government agencies, subcontractors, and suppliers.

4.1.6 The contractor will operate a Management Information Center and maintain a project-level information file.

4.1.7 The contractor is directly responsible and accountable for all Government property in accordance with the requirements of the contract. This includes Government property in the possession and control of a subcontractor. The contractor shall establish and maintain a system to control, protect, preserve and maintain all Government property. This property control system shall be in writing. The system shall be reviewed and approved in writing by Defense Contract Management Agency (DCMA) property administrator.

4.1.7.1 The Government shall provide to the contractor the property as set forth in Attachment J-4-A of this contract.

4.2 Information Systems

4.2.1 The contractor will administer computer hardware and software programs oriented to the Project Management System, Configuration Control, Business Systems, and Production Systems at Michoud Assembly Facility (MAF). This includes all programming, administrative, and support activities associated with the proper operation and protection of these systems and the data developed utilizing them.

4.2.2 The contractor will provide computer telecommunications support for data associated activities beyond the monument, which is defined in LMC-ET-MA91.

4.2.3 The contractor will coordinate the Computer Services support to the scientific activities and systems to include the NASA Consolidated Computer Data Processing Center located at MSFC.

4.3 Procurement Management

4.3.1 The contractor will provide a Procurement System to integrate technical, business and management functions into a disciplined auditable procurement activity.

4.3.2 The contractor shall provide an integrated procurement system to direct and control intra and interdivisional work, subcontractors and suppliers; authorize subcontractor tooling and equipment; analyze subcontractor performance, progress, and document and provide corrective action as required.

4.3.3 The contractor will conduct subcontractor and suppliers reviews; implement test and inspection support for the Critical Items List/Pre-flight Assessment Review; and provide for onsite coordination and evaluation for procurements.

4.3.4 The contractor will maintain records and submit required reports relating to Small and Small Disadvantaged Business participation in External Tank Project Procurements.

4.4 Safety, Reliability and Quality Assurance

The contractor shall operate a system to assure that the ET requirements are met in the production, test and delivery of the ET in accordance with the "Safety, Reliability and Quality Requirements and Implementation Document", MMC-ET-RA03, which implements NSTS 5300.4 (1D-2) as set forth therein.

The system shall provide for motivational, safety, reliability and quality assurance activities to ensure provisions are made to provide acceptable hardware through systematic procedures, training, analysis, review and assessment. The system shall also provide safety, reliability and quality assurance requirements and activities for all subcontract and supplier hardware. Specific requirements are as follows:

4.4.1 Safety

The contractor's Safety system provides Safety Management and System Safety including Hazard Data Collection, Analysis and Corrective Action, Incident/Accident Investigation Reporting and Trend Analysis, Mishap Investigation and Reporting, Risk Management and Safety Program Reviews. The system also includes Industrial Safety to ensure the safety of people, property and the environment throughout the life cycle of the External Tank program and through all phases of contract performance.

4.4.2 Reliability Assurance

The contractor's Reliability system provides Reliability Management and Reliability Assurance. The system also provides Reliability Interfaces with Safety, Quality Assurance, Inspection, Test and Evaluation, Production Operations, Facilities and Shuttle Integration for the External Tank program in conjunction with other project functions to ensure that quality requirements are identified and satisfied through all phases of contract performance.

4.4.3 Quality Assurance

The Contractor's Quality Assurance system provides Quality Program Management and Planning, Design and Development Controls, Identification and Data Retrieval, Procurement Controls and Fabrication Controls. Test planning, Inspection and Evaluation. The system provides Nonconformance Management, Reporting and Trend Analysis, Metrology Controls, Stamp Control and Handling, Storage, Packing, and Shipping controls and Sampling Plan requirements. The system provides Quality Program Audits of personnel, procedures, and operations, which implement the quality program. The system also provides Government Property Control and Flight Test/Ground Operations Support for the External Tank program in conjunction with other project functions to ensure that quality requirements are identified and satisfied through all phases of contract performance.

5.0 PROJECT ENGINEERING AND INTEGRATION

5.1 External Tank Flight Operations Support

5.1.1 The contractor shall perform Flight Operations Support tasks as identified in Attachment J-10-A hereto. Any extraordinary support resulting from major anomalies or changes in mission model will be the subject of separate contractual action.

5.1.1.1 Reporting or documentation functions performed as part of the Flight Operations Support activities are provided to support actual flight schedules based on direction of the Contracting Officer's Technical Representative and are not identified as deliverable documentation herein.

5.1.2 The contractor will provide mass properties accounting information and actual weight information for each External Tank.

5.2 Production Engineering and Hardware Certification

5.2.1 Technical Support

5.2.1.1 The contractor will provide Product Technical Support (PTS) to clarify/interpret production drawings/requirements, participate in producibility and status reviews, generate defect dispositions which includes review, analysis and disposition of Non-Conformance Documents (NCDs) with repair criteria if required, database development and maintenance for production materials and processing anomalies; development and maintenance of fingerprint database of External Tank flight materials; and identification, screening, and recommendation of potential candidates of new Thermal Protection System constituent materials and insulation systems to mitigate risk of material or vendor obsolescence issues. The contractor will provide design solution or reconciliation through Liaison Calls (LC) and Production Action Calls (PAC's) responses, as well as support NCD corrective action analysis and trending for repetitive NCD reduction. The contractor will provide for Senior Management Reviews (SMR) to address selective NCD dispositions.

5.2.1.2 The contractor will also maintain acceptance test requirements and provide support to Hardware Acceptance Committee Reviews, Flight Readiness Reviews, Test Readiness Reviews and Tool Operational Readiness (ORI) Reviews.

5.2.1.3 The contractor shall require, review, and approve all supplier documentation pertinent to engineering drawings and procurement documents.

5.2.1.4 Effective October 15, 2001, the contractor will no longer provide the effort necessary to perform research and/or studies to ensure no disruption to External Tank production, including tasks directed at resolving production anomalies on issues related to the basic manufacturing of the External Tank. These efforts include but are not limited to foam blowing agent identification, characterization and verification of environmentally compliant materials and processes, alternate material and vendor obsolescence issues and weld integrity activities. In the event such tasks not being performed results in disruption to External Tank production, this contract will be subject to equitable adjustment.

5.2.2 Launch Readiness Support

5.2.2.1 The contractor shall furnish the necessary engineering skills, labor, materials and equipment (except that specified to be provided by the Government) to provide the capability to support External Tank Launch Readiness Assessment, Flight Certification and Shuttle Processing at the launch site. These activities shall include the monitoring and reporting of ET activities at KSC, defining processing requirements for Mod Kits to resolve ET problems or to implement design changes. In addition, the contractor will review and coordinate training and certification requirements for critical skills; and review, prepare and/or coordinate changes to NSTS 08171, Files I, II, IV OMRSD and NSTS 16007 LCCD.

5.2.2.2 The contractor will provide Flight Readiness Review (FRR) support, and Launch Support to KSC and concurrence at the Launch Site Material Review Board (MRB). The contractor will provide Action Requests (AR) for problem/concern resolution on the ET and provide Mission Management Team Membership for real time launch activities.

5.2.2.3 The contractor will support MSFC Main Propulsion System (MPS) assessments for flight and test preparations by providing predicted ET/Shuttle Propulsion System performance and capabilities; Mass Properties; and propellant inventories for each flight and test. Performance predictions shall be based on Government Furnished data. Performance predictions shall be submitted to the ET Project Office in accordance with the established memorandum format.

5.2.3 Logistics Support to KSC and MSFC

5.2.3.1 The contractor shall provide Logistics support in accordance with the applicable requirements of NSTS 07700, Volume XII as implemented by ET Project Operational Logistics Implementation Document, MMC-ET-LS02. This includes support to the MSFC ET Project Office and the Systems Logistics Manager by providing Supportability Trend Analysis and Reporting System (STARS) data and status; providing required support to the ET Project Office for activities of the SSP Integrated Logistics Panel and associated sub-panels; and coordinating the Mission Support Room activities with off site groups (LSS and MSFC) in identifying Logistics requirements to resolve technical problems.

5.2.3.2 The contractor will provide the following: logistics analysis to determine spares, expendable/consumable materials and maintenance requirements for ET related Support Equipment (SE) and the Ground Umbilical Carrier Assembly (GUCA). The contractor will prepare, coordinate, and release Operational Maintenance Documentation (OMD) required to provide logistics support and maintenance requirements to include the Recommended Spare Parts List (RSPL), Work Unit Code (WUC) Manual, Critical Line Replaceable Unit (LRU) list, Special Consideration Items Drawing (SCID) and the Operations and Maintenance (O&M) Manuals for Support Equipment and the GUCA. The contractor will provide the required supply actions for non-provisioned LRUs and the replenishment of provisioned LRUs at KSC.

5.2.3.3 The contractor will establish and maintain controls to ensure that the integrity of LRU off-line maintenance certification at the launch site and vendors has not been invalidated as a result of activity, or when key elements of certification, i.e., facilities process/procedures or personnel, have been changed. The contractor will maintain, track and status time/age/cycle data for components on complete end items and operational logistics spares.

5.2.3.4 Spares for support of the Flight Program shall be provisioned by NASA in accordance with Attachment J-8-A, "Provisioning Procedures for External Tank Spare Parts."

5.2.4 Engineering Reliability Support

5.2.4.1 The contractor shall provide Engineering Reliability support in accordance with the applicable requirements of NSTS 5300.4 (ID-2) as implemented by ET Project Safety, Reliability and Quality Requirements and Implementation Document, MMC-ET-RA03. This effort encompasses the following tasks:

5.2.4.2 The contractor will support design, delivery and operational use with reliability analyses, trade studies, statistical analyses and failure rate determinations. The contractor will review and impact, as necessary, safety, certification, failure/anomaly documentation and changes to operational activities to ensure compliance with reliability requirements and incorporation into reliability documentation and/or waiver processes. The contractor will provide reliability analyses and spares recommendations for critical tooling and facilities. The contractor will support and maintain Government Industry Data Exchange Program (GIDEP) Engineering, Reliability, Maintainability and Metrology Data Interchanges.

5.2.5 Flight Evaluation for ET Hardware Certification

The contractor shall provide and maintain Engineering technical capability and the flight database to support flight performance assessments that affect the ET Hardware Certification for Flight. Evaluation of any flight anomalies or problems, as defined in Paragraph 6.1 of the Operational Space Shuttle Flight Evaluation Plan and reported by the Flight Evaluation Working Group, will be performed to assess the impact on the ET to future flights.

5.2.6 Interface Definition Requirements

The contractor shall maintain the External Tank Interface Definition requirements and prepare/review/process new interface design changes. The contractor shall participate in the Space Shuttle Program Office ICD Change Board and the Space Shuttle Program Office Interface Working Group activities. The ET interface design and performance requirements are defined/controlled by the documents set forth in the ET End Item Specification. The ICD revisions, revision date, and the applicable Interface Revision Notices (IRNs) shall be listed in the latest issue of the "External Tank Interface Control Documentation Contractual Index and Status Report", CM-017-015-2H.

5.2.7 Generic Environments/System Analysis Support

The contractor shall provide analytical support in response to MSFC requests to assess generic environments for the ET design. The contractor shall provide technical expertise to support Space Shuttle Program Panels and Working Groups in the performance of system related analyses, investigations and actions as related to External Tank loads, trajectories, venting, aerodynamics, thermal loads, debris, range safety, etc. The contractor shall notify the Contracting Officer when any panel or Space Shuttle Program Office supported issues will impact the External Tank design.

5.2.8 Space Shuttle Program Requirements and Quick Looks

5.2.8.1 The contractor shall perform technical reviews of all changes proposed by the Space Shuttle Program requirements as base-lined or changed by the Space Shuttle Program Requirements Control Board Directive (PRCBD), proposed by Change Request (CR) and those ET Project requirements which implement same. The traceability to NSTS 07700, Volume X shall be maintained in a cross-reference matrix in the ET End Item Specification.

5.2.8.2 In accordance with the requirements of paragraph 6.4 of the NASA approved Configuration Management Plan, MMC-ET-CM01-B, the contractor shall identify changes that would impact ET design and/or contractual requirements documentation and provide the contractor's recommended disposition of the change. This shall include the providing of the "Quick Look" capability for impact assessment of Space Shuttle Program or Level III change data as requested by the ET Project.

5.2.8.3 Additionally, the contractor will provide support at MAF for ET Project Configuration Control Board (CCB), ICB and Space Shuttle Program Office PRCB reviews and dispositions of changes. Presentation material and supporting data for these review boards shall be provided by the contractor as required. The contractor will provide engineering support for NASA/MSFC preparation of ET Critical Items List (CIL) waivers to be incorporated in Volume X of NSTS-07700.

5.2.9 Propulsion Systems Integration Group (PSIG)

The contractor shall provide Engineering technical expertise to support the PSIG in the performance of propulsion-related analyses and investigations; assessing proposed Shuttle changes for Main Propulsion System (MPS) performance or operations impacts to ET; pre-coordination of proposed or potential ET changes, hardware tolerances, and deviations which may impact Shuttle MPS performance or operations; evaluating and coordinating ET data and performance with other MPS elements; and in supporting PSIG directed meetings and designated sub-panels.

5.2.10 Stress Analysis Database Maintenance

The contractor shall maintain the Stress Analysis database to reflect changes thereto. The contractor will assess requirement updates that are baselined on the ET Project to determine if their incorporation is part of this maintenance task or constitutes a new basic analysis task.

5.2.11 Senior Management Review (SMR)

The contractor shall operate a Senior Management Review System to evaluate significant Material Review Board (MRB) dispositions. The following selection criteria apply for significant MRB dispositions: (a) unique one-of-a-kind repairs; and (b) use-as-is and repair dispositions that are considered outside of the ET contractor's "current database."

The contractor will obtain government authorization for MRB dispositions on nonconformance documents (NCDs) in those circumstances where the nonconformance is considered "Out of Family."

5.3 External Tank Launch Support Services (KSC)

5.3.1 The contractor, through its on-site organization at KSC, will support the Government and the Space Flight Operations Contractor (SFOC) with launch site expertise on ET design and processing requirements.

5.3.2 The contractor will provide or coordinate support in the areas of processing operations; anomaly resolution; Configuration Management; Safety, Reliability and Quality Assurance; modifications with regard to the ET; associated support equipment; hardware/software interfacing, and training and certification as defined in Attachment J-9-A hereto entitled External Tank Launch Support Services (KSC).

5.4 MSFC Operations Support

5.4.1 On-Site Program Requirements Compliance

5.4.1.1 The contractor will provide an onsite capability at the MSFC facility as noted below, to assure continued compliance with production program requirements and regulations associated with the operations and maintenance of the ET Project Program functions related to hardware certification and verification.

5.4.1.2 The contractor will provide unique hardware analysis/assessments in response to MAF and/or Program requests as part of its continuing hardware development and production activity. The contractor will provide evaluation, coordination, preparation, presentation, and distribution of Change Evaluations; Change Requests; Configuration Control Board Directives; Hardware Certification revisions; OMRS Requirements Change Notices; LCC Launch Change Notices; Material Review/Interface Working Group Reviews inclusive of Interface Requirement Notices; Space Shuttle Program Requirements Boards inclusive of Program Requirements; Control Board Directives; and ET Configuration Control Board Agendas and Minutes.

5.4.1.3 The contractor will prepare, coordinate and distribute Special Development Studies and associated disposition documentation as well as provide liaison between on-site contractor and NASA Personnel.

5.4.1.4 The contractor will provide unique ADP functions in the business application areas pertaining to the continuing External Tank hardware development and production activity.

6.0 EXTERNAL TANK PRODUCTION

6.1 The contractor will provide the materials and effort for the manufacturing, assembly, test, checkout, and delivery of operational flight articles in order to meet the terms and conditions of this contract. These requirements cover all effort, skills, materials, hardware, and management (except for items to be provided by the government) for the delivery of External Tanks.

6.1.1 Structures

The contractor will provide materials and effort necessary for the production and in-process testing of the structure subsystems in accordance with the requirements for flight hardware.

6.1.2 Propulsion and Mechanical Subsystem

The contractor will provide materials and effort necessary for the production and in-process test of the propulsion and mechanical subsystem in accordance with the requirements for flight hardware.

6.1.3 Electrical/Instrumentation Subsystem

The contractor will provide materials and effort necessary for the production and in-process test of the electrical/instrumentation subsystem in accordance with the requirements for flight hardware.

6.1.4 Final Installation, Assembly and Checkout

The contractor will provide materials and effort necessary for the final installation, assembly, checkout and acceptance of flight hardware and instrumentation in accordance with the requirements set forth in the ET End Item Specification.

6.1.5 Thermal Protection System

The contractor will provide materials and effort for the application of the Thermal Protection System in accordance with the requirements for flight hardware.

7.0 FACILITIES, MAINTENANCE AND ENVIRONMENTAL OPERATIONS

Facilities and Maintenance

The contractor shall perform the following operations and maintenance of the Michoud Assembly Facility (MAF) to accommodate the fabrication and assembly of the External Tank in accordance with the project schedules and delivery requirements. This responsibility includes the performance of those production support activities, which are required for the continued operation of the MAF at a basic level of efficiency, safety, and sanitation except for normal deterioration expected for fair wear and tear. Facilities Operating Plan, LMC-ET-MA91, defining the services to be performed by the contractor is included in this contract by reference and is subject to all its terms and conditions.

7.1 Planning & Control

7.1.1 The contractor will provide the necessary planning and controls to include the establishment of command media and management systems and reports necessary to support of External Tank operations and maintenance.

7.1. 2 The contractor will provide master planning that includes coordination of projects among prime contractor and tenant activities; maintaining Real Property Records for reporting purposes and distributing data to applicable users.

7.1.3 The contractor will provide engineering support for various project requirements to include estimating, technical assessments, and support to change proposals.

7.1.4 The contractor will provide Property Management to include systems control, government interfacing and reporting, maintenance of MAF Operation and Maintenance and Production primary property records, and performance of custodial services.

7.1.5 The contractor will identify and forecast GFP pressurant and propellant usage required for External Tank production and provide to the MAF site operations and maintenance contractor for consolidation and subsequent ordering.

7.2 Equipment Acquisition/Rehabilitation

7.2.1 The contractor will provide engineering, administration, and supervision in support of acquiring ET related plant equipment to include the development of equipment requirements and specifications, obtaining and evaluating vendor quotes, supervision of equipment performance checkout, and preparation of equipment maintenance requirements. Specific equipment acquisition by the contractor and the provisions for their installation as required to support production will be authorized by separate contractual action pursuant to Attachment J-1 of Contract NAS8-39243(F), or its successor(s).

7.2.2 The contractor will provide engineering, administration, and supervision in support of the rehabilitation, rearrangement/alteration of ET related plant equipment based on maintenance records, capability, age and condition. This includes the development of equipment/facilities requirements, specifications and design criteria, vendor/subcontractor selection, rearrangements and alteration design, project management, preparation of work authorization, schedules, and project performance and status. Specific equipment rehabilitation projects required to support production will be authorized by separate contractual action pursuant to Attachment J-2 of Contract NAS8-39243(F), or its successor(s).

7.3 Rearrangement and Alteration

7.3.1 The contractor will provide labor, materials, equipment, and supplies required for the performance of R & A projects at the MAF to accommodate fabrication, assembly and test of the External Tank. R & A projects are those projects estimated at less than $200,000 that usually change the facility configuration.

7.3.2 The contractor will ensure that each R & A project is technically authorized pursuant to the requirements contained in DRD LMC-ET-MA91.

7.4 Construction of Facilities (CoF)

7.4.1 The contractor will be responsible for identifying and supporting the coordination of CoF projects required to support ET production to include project justification and prioritization. The contractor will provide these project descriptions to the MAF site operations and maintenance contractor who is the single point of contact for coordinating the approval of all MAF CoF projects.

7.4.2 With respect to each site-related CoF project, the contractor will provide Project Management and Engineering support for the construction, modification and upgrade of facilities to include planning, budgeting, scheduling, identification of detail plant layout and feasibility studies, developing design criteria for NASA-approved projects, selection and management of A&E design, Change Control Board activities, 30%/60%/90% and final design reviews and analysis of as-built conditions.

7.4.3 Specific facility modifications and construction projects required to support ET-related operations will be authorized by separate contractual action pursuant to Contract NAS8-39243(F), Attachment J-3 or its successor.

7.5 Maintenance and Operations

7.5.1 The contractor will develop a maintenance program for servicing and supplying real property, facilities, and equipment in accordance with the Facilities Operating Plan (LMC-ET-MA91), Appendix A – Maintenance Interface Matrix.

7.5.2 The contractor will provide a maintenance program that includes the necessary Engineering, Administration, Supervision and Craft Labor for performing preventive, corrective, predictive and alternative maintenance of property and equipment as well as for the operation of plant systems. In addition, the contractor shall provide a critical production systems operation program on selected production systems to assure a constant state of production readiness by performing the following functions with regard to MAF Facilities:

7.5.2.1 Functionally checkout systems and procedures.

7.5.2.2 Evaluate systems operating procedures.

7.5.2.3 Administration of configuration control process.

7.5.2.4 Check and maintain configuration control drawings.

7.5.2.5 Check calibration performance verification, operations of support systems.

7.5.3 The contractor will provide preventive and corrective maintenance for general purpose ADPE, to include the ADPE being utilized by the MAF site operations and maintenance contractor.

7.5.4 Maintenance to restore an item or system to an operating condition that exceeds $25,000 or 15% of the replacement value will require approval of the MAF Resident Manager's Office prior to proceeding. The contract will be equitably adjusted for restoration or capital-type rehabilitation of a worn item of facility, equipment or system to its original condition where the cost exceeds $25,000.

7.5.5 The contractor will provide routine minor maintenance and repair of assigned vessels, and their docking and proper securing in the harbor. Dry-docking services are specifically excluded. Other responsibilities are as outlined in the Facilities Operating Plan (LMC-ET-MA91), Appendix A – Facilities Maintenance Matrix.

7.5.6 The contractor will operate ET production related processes, systems and equipment at MAF. Operations consist of the work performed on plant processes, systems and equipment that do not otherwise qualify as maintenance.

7.6 Environmental Operations

7.6.1 The contractor shall comply with Environmental Laws and regulations as baselined in the document "NASA/Lockheed Martin Corporation Responsibilities for Environmental Laws Compliance" Document Number MMC-ET-MA89.

7.6.2 The contractor shall identify to NASA through the MAF site operations and maintenance contractor, any facility modifications or projects required to comply with new or changed environmental requirements and the contract shall be modified and equitably adjusted to incorporate such facility modifications and/or projects. In the event that projects associated with environmental laws and regulations are not authorized, costs resulting from non-compliance shall be allocable and allowable and/or non-compliant operations may be discontinued after notification to NASA until satisfactory resolution of the non-compliant condition.

7.6.3 The contractor will take steps to mitigate hazardous conditions; support sponsored pollution prevention efforts; review with the MAF site operations and maintenance contractor production process changes for environmental permit impacts; and provide data required for submittal of reports and modification of environmental permits.

7.6.4 Compliance with newly promulgated laws and regulations will be the subject of an equitable adjustment to this contract.

7.6.5 The contractor will provide the resources necessary to perform cleanup of environmental spills as a result of External Tank production operations.

7.6.6 Clean up activities, for pre-existing conditions, will be performed by separate contractual action under Contract NAS8-39243 (F) or its successor.

7.7 Minor Revitalization

7.7.1 The contractor will perform Minor Revitalization projects that either alter or repair buildings, structures or other real property that have been assigned to support ET production. These projects have an estimated value of $200,000 to less than $500,000.

7.7.2 The contractor will ensure that each Minor Revitalization project is technically authorized pursuant to the requirements contained in DRD LMC-ET-MA91 prior to initiating the work.

7.7.3 Implementation of Minor Revitalization tasks will be subject to separate contractual action and equitable adjustment.

8.0 EXTERNAL TANK SYSTEM SUPPORT

8.1 External Tank Training

The contractor will provide services and materials required to conduct training for the ET Project. Training services include course development, preparation of training aids and materials, and presentation of training courses at MAF to ET contractor personnel involved in the fabrication, testing, operation, transportation, and maintenance of project hardware and equipment during MAF production and transportation of flight hardware. The contractor will provide the certification and maintenance of required proficiency levels for ET contractor personnel involved in the fabrication, testing, operation, transportation and maintenance of project hardware and equipment during MAF production and transportation of flight hardware.

8.2 Special Tooling and Support Equipment

8.2.1 The contractor shall provide the services and materials to maintain that special tooling required to assemble ET parts, subassemblies and assemblies, which includes all jigs, dies, fixtures, molds, patterns, taps, gauges, other equipment and manufacturing aids, and replacement thereof, which are of such a specialized nature that, without substantial modification or alteration, their use is limited to the production of particular parts.

8.2.2 The contractor shall provide the services and materials to maintain Special Test Equipment (STE), which is that equipment and associated software required to support Manufacturing site checkout of the ET, its subassemblies, or other ET system elements during manufacturing buildup.

8. 3 Transportation and Handling

The Contractor shall provide the services and materials required to transport, handle, and maintain the ET, its subassemblies, or other ET system elements within the manufacturing facility and at other Government facilities authorized in this contract.

8.3.1 The contractor shall provide the services and materials to maintain the equipment and associated software required to transport, handle, and maintain the ET, its subassemblies, or other ET system elements within the manufacturing facility, at other Government facilities authorized in this contract.

8.3.2 The contractor will provide transportation services to transport the External Tank, its major subassemblies and STE/TSE from the point of final assembly to the point of barge loading and embarkation to include that effort required to load, tie down and secure the hardware/gear/equipment/material on marine vessels. Barges will be ballast for sea by the contractor's personnel. External Tank Barge shipment will be unmanned.

8.4 Manufacturing Operations Support

The contractor will provide manufacturing operations support for External Tank build efforts by providing the following:

8.4.1 The contractor will provide planning documentation (e.g. PPDs, MPPs, Ops, Test Procedures, Tool Instruction Manuals, and Tool Maintenance Procedures) necessary to support component installation, assembly, test and checkout.

8.4.2 The contractor will maintain a program to determine production hardware status and availability of components to support operational schedules.

8.4.3 The contractor will integrate tooling, rigging and crane operations, and factory support to assure proper interface with material and assembly flow plans.

8.4.4 The contractor will provide support and interface with the As Built Hardware Reporting and the Tool Configuration Management Systems.

8.4.5 The contractor will implement work requirements, detail shop work orders and schedules, maintain tool cribs and stock rooms, expedite production hardware and maintain production status in support of total production operations and tests.

8.4.6 The contractor will provide both still and video photographic services for ET production requirements.

9.0 PROGRAM PROVISIONING TASKS

9.1 Special Development Studies - The contractor shall provide technical expertise required for performing analyses, trade studies, and evaluations/assessments to support Space Shuttle flight operations (Special Development Studies). These studies, which include at a minimum, special tests, hardware design/development, hardware modeling, or new computer software/program acquisition or development will be performed in accordance with Attachment J-6-A of this contract entitled "Statement of Work for Space Shuttle System Integration Support." Implementation of these defined studies will be as directed by the Contracting Officer's Technical Representative pursuant to clause G.5 entitled "Technical Direction and Surveillance".

9.2 Technology Utilization/Transfer – The Contractor shall provide for utilization and transfer of External Tank Technology developed under this contract (hereafter "ET Technology") into the academia, public, and private entities. This program is designed to allow the Contractor to transfer and to provide consulting, design and development expertise for implementation of ET Technology, for public, private and governmental benefits. The contract will be equitably adjusted for any Task Orders authorized under this contract and included in Attachment J-11-A.

9.3 Technical Directives - The contractor will provide the necessary management, labor, materials and equipment (except that to be furnished by the government) in support of MSFC Center of Excellence initiatives. The support to these initiatives will be accomplished utilizing Technical Directives authorized pursuant to Attachment J-6-A. In support of these Technical Directives, the contractor will perform analyses, studies, evaluations and tests as well as develop program implementation costs and schedules, where appropriate.

10.0 INCORPORATION OF PROJECT AND ENGINEERING CHANGE PROPOSALS (PCP/ECP'S)

10.1 The contractor shall submit in writing Engineering Change Proposals (ECPs) and Project Change Proposals (PCPs) in accordance with MMC-ET-CM01, External Tank Project Configuration Management Plan.

10.2 The contractor shall implement MSFC approved Project Change Proposals and Engineering Change Proposals in accordance with the clause of this contract entitled, "Changes - Cost Reimbursement - Alternate V". PCPs/ECPs approved for performance by the contractor shall be deemed definitized as listed in the latest issue of the "External Tank Configuration Identification Index and Modification Status Report", CM-017-19-2H, incorporated herein by reference.

ATTACHMENT J-4-A

GOVERNMENT-FURNISHED PROPERTY, DATA & SERVICES

A. During the performance of this contract the Government will provide, on a no charge basis, the Government-Furnished Property, Data and Services identified in Appendix I to this attachment.

B. The documents enclosed in the Lockheed Martin letter dated October 1, 2000 Reference 00MO-0686 are incorporated herein by reference, thus providing a "by-item" listing for the following Government-Furnished Property categories:

Special Tooling
Special Test Equipment
Transportation Support Equipment
Plant Equipment
Subcontractor Tooling
Real Property Summary
Calibration Items

Tooling fabricated under Contract NAS8-36200 and not presently being used will be incorporated herein when added to the appropriate listings above upon first usage. Additional GFP furnished subsequent to the Reference 00MO-0686 letter will be incorporated herein when added to the appropriate listings above. Under the terms and conditions of Attachment J-4 of NAS8-39243(F) or the successor contract, the Government will provide the physical plant facilities of the Michoud Assembly Facility for use in the fabrication, assembly, test and delivery of External Tanks. Construction projects will be completed enabling the MAF physical plant facilities to be maintained in a good state of repair and to allow for the continued and efficient production of External Tanks. Under Attachment J-3 of NAS8-39243(F) or successor contract, the Government will provide for rehabilitation, as required, of the equipment provided herein.

The documents enclosed in the Lockheed Martin letter dated July 25, 2002 Reference 02M0-0549 are incorporated herein by reference, thus providing a "by item" listing for the following Government-Furnished Property categories:

ALWT Hardware
Miscellaneous (GPINV) Items

C. The Government and the Contractor have agreed to establish a Schedule Interface Log (SIL) to identify contractual required dates for providing Government-Furnished Property, Data and Services identified in this Attachment J-4-A. Identified dates will be changed only as requirements change by mutual agreement of the parties. It is mutually agreed that the SIL will be formatted as follows:

(1) The required dates for GFP items that are identified in the following Sections of Appendix I to this attachment will not be reflected in the SIL:

Section A - Tank Transportation

Rationale: Scheduled by NASA/MSFC as required to support Launch operations at KSC.

Section B - Propellants and Pressurants

Rationale: DPD 660 - DR MA11 requests and forecasts propellant and pressurant requirements.

Section C - Computer and Data Service (ADP)

Rationale: These requirements are identified in the mutually agreed to documents: "ET Project Data Systems Long Range Plan" and the "Memorandum of Understanding between the NASA Automated Data Processing Consolidated Center (NACC) MSFC and Lockheed Martin (LMMSS)" dated September 11, 1996, Version 1.1.

Section H - Telecommunications

Rationale: Obtain on an as-needed basis through the ET Resident Office at MAF.

Section I - Composite Nose Cone Manufacture

Rationale: These requirements are identified in Engineering Change Proposal B01775D dated January 21, 1993, or as modified by subsequent mutual agreement of parties.

(2) Spares for other Categories of hardware, i.e., transportation equipment, flight and major test article hardware will be reflected in the appropriate section of Attachment J-4-A or the SIL for which they are required to support.

(3) Lockheed Martin Space Systems Company – Michoud Operations interface and coordination of requirements and schedule need dates will be with and through the MSFC ET Project, USA, and Resident Offices.

APPENDIX I TO ATTACHMENT J-4-A
GOVERNMENT-FURNISHED PROPERTY, DATA & SERVICES

CONTENTS

ATTACHMENT J-4-A

SECTION "A"

TANK TRANSPORTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
Modify Item 1 of Section A as follows (changes noted in bold print):			
1.	Water Transportation Barges		1
	A. Pegasus barge and barge support equipment (Barge and barge tie-down equipment to be provided by NASA)	To transport flight articles to launch site.	
	B. Poseidon barge and barge support equipment (Barge and barge tie-down equipment to be provided by NASA)	To transport flight articles to launch site.	1

SECTION "B"

PROPELLANTS AND PRESSURANTS

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
1.	Propellant Pressurizing Agent, Nitrogen Type I, Gaseous	MIL-P-27401C	*and Note 1
2.	Propellant Pressuring Agent, Helium	MIL-P-27407 (USAF)	*and Note 1
3.	Propellant Pressurizing Agent, Nitrogen Type II - Liquid	MIL-P-27401C	*and Note 1
4.	Helium Type II - Liquid	MSFC-SPEC-364C	*and Note 1

* Required in sufficient quantities and in time to support delivery and operation. Refer to MA11b for detail delivery requirements.

NOTE 1 - The above listed GFP propellants and pressurants are for Contractor's use only. Propellants and pressurants for Lockheed Martin Subcontractors and their subcontractors shall be Contractor furnished.

SECTION "C"

COMPUTER/DATA SERVICES

EQUIPMENT AND SERVICES REQUIRED/PROVIDED AND/OR OPERATED BY THE GOVERNMENT

ITEM NO.	NOMENCLATURE	LOCATION	QUANTITY
1.	Mainframe Computing Services: IBM compatible mainframe computing services required to run ET business and technical software applications. This includes processors, mass storage devices, back-up devices, operating systems software, utilities, libraries, common use applications, 24 hr/7 day operations support, offsite backup storage, and other associated software and hardware required for on-line batch processing applications.	KSC, MSFC and MAF	See Note
2.	Scientific Computing Services: VAX and Cray scientific or equivalent computing services required for design and analysis of ET hardware. To include processors, mass storage devices, back-up devices, operating system software, utilities, libraries, 24 hr/7day day operations support, offsite backup storage, and other associated software and hardware required for on-line and batch scientific applications.	KSC, MSFC and MAF	See Note
3.	Communications Services: a. Inter Center communications services between MAF and MSFC to support items 1 and 2 above to include TCP/IP, SNA connectivity and IBM channel extension. b. Inter Center communications to all other NASA centers. c. World-wide internet connectivity.	KSC, MSFC and MAF	See Note

SECTION "C" (Continued)

COMPUTER/DATA SERVICES

EQUIPMENT AND SERVICES REQUIRED/PROVIDED AND/OR OPERATED BY THE GOVERNMENT

ITEM NO.	NOMENCLATURE	LOCATION	QUANTITY

NOTE: The above services (Line Items 1-3) shall be as established by MOU between the NASA Office of Space Flight Automated Data Processing Consolidated Center and Lockheed Martin (LM Reference 94MO-0805): Lockheed Martin will forecast yearly and 5 year projections of computer utilization, tape usage and disk storage requirements/needs and submit to NASA. NASA shall monitor usage and plan for increases or decreases in use. SHOULD A FAILURE ON THE GOVERNMENT'S PART CAUSE LOSS OF FACTORY PRODUCTION OF MORE THAN 24 HOURS, A CLAIM SHALL BE PROCESSED IN ACCORDANCE WITH "GOVERNMENT PROPERTY CLAUSE".

4.	ADPE Equipment and Maintenance:	MSFC	See Note below
	a. Office environment desktop computers and associated equipment		

NOTE: All office environment desktop computers and associated equipment that was provided by the NAS8-39243(F) Contract, or its successors, and transferred to NASA/MSFC Information Management System Accountability by DD1149.

SECTION "D"

SPECIAL TOOLING

ITEM NO.		NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
1.		Interface tooling to support liquid level sensors and engine cut off sensors		
			R/I Tool No.	
	*A.	Thermal Shock Fixture	J111141	1
	*B.	P.C.B. Environment. chambr.	T7478148	1
	*C.	Speed Response Fixture	J111140	1
	D.	Swagging Tool		3
	*E.	Sensing Wire Slack	T7498124	1
	F.	Forming Block	T7498125	2
	*G.	Swagging Tool	T7498126	1
	*H.	Holder	T7498127	4
	I.	C Bore & Stack Fixture	T7498133	1
	J.	Drill Jig	T7498134	1
	K.	Lathe Fixture	T7498135	1
	L.	Fixture	T7498136	1
	*M.	Sensor Wire Winding Jig	T7498143	1
	*N.	Par, Gap Weld Electrode	T7498144	1

*NOTE: Items A, B, C, E, G, H, M & N will require joint usage with Boeing North American

SECTION "D" (Continued)

SPECIAL TOOLING

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
2.	Special tools to support lapping of the ET/ORB Aft Umbilical Disconnect Assy Flanges (17" and 2")		
	A. Lapping tool, disconnect Model A78-5202*	P/N GW78-505202-001 Consisting of: P/N 1395-515 Tool Set (T19-0058) P/N 1414-BSC Tool Set (T19-0058) P/N 1395-515 Tool Set (T19-0062) P/N C14-298-2 Tool Set S/N's 5790012 5790013 5790014 5790015	1 ea 1 ea 1 ea 1 ea 1 ea
	B. LH2/LO2 Umbilical Stand (Frame)	P/N 11EH-F-1033-XXX (T7181137-XX and/or T7181138-XX)	1 ea
	C. LH2/LO2 Umbilical Stand (Dolly)	P/N 11EH-F-0302-XXX or equivalent (T7180364-XX)	1 ea

*Supports Section G, Item 1.

SECTION "D" (Continued)

SPECIAL TOOLING

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
3.	Spare tools to support the installation and production processing of the ET/ORB Aft Umbilical Disconnect Assys (See Section "G", Item No. 1)		
	Rosan Insert Tools		
	A. 2" & 4" Disc Drive Wrench	P/N SR25W-A	1 ea
	B. 2" & 4" Disc Swage Tool	P/N SR25S-A	1 ea
	C. 2" & 4" Disc Removal Tool	P/N SR25R	1 ea
	D. 17" Disc Drive Wrench	P/N SR43W-A	1 ea
	E. 17" Swage Tool	P/N SR43S-A	1 ea
	F. 17" Removal Tool	P/N SR435-A	1 ea

SECTION "E"

SPECIAL TEST EQUIPMENT AND TEST TOOLS

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
1.	LO2 ET Disconnect Cover Plate Set	GW78-405201-XXX*	**
2.	LH2 ET Disconnect Cover Plate Set	GW78-405200-XXX*	**
3.	NASA Standard Initiator, Type 1, (NSI-1), (Initiator to Mate with a NBS9E - Connector) for test of Separator Bolt, PD5000020	JSC P/N SEB 26100001-216	
	1. First Lot Buy		
	(a) Pressure Cartridge Lot Acceptance Test (LAT)		10
	(b) Load Verification		3
	(c) Annual Integrity Test at Launch Site		7
	(d) Separator Bolt Lot Acceptance Test (LAT)		10
	2. Second Lot Buy		
	(a) Pressure Cartridge Lot Acceptance Test (LAT)		10
	(b) Load Verification Test		3
	(c) Annual Integrity Test at Launch Site		7
	(d) Separator Bolt Lot Acceptance Test (LAT)		10

* Installed on Item 1 of Section "G" NOTE: All subtier parts and assemblies are listed in the Lockheed Martin Schedule Interface Log (SIL) and reflect the current approved configuration. Also the SIL will continue to reflect appropriate effectivities.

** One per Ship Set for Item 1 of Section "G".

SECTION "E" (Continued)

SPECIAL TEST EQUIPMENT AND TEST TOOLS

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
3. (cont)	3. Third Lot Buy		
	(a) Pressure Cartridge Lot Acceptance Test (LAT)		10
	(b) Load Verification Test		3
	(c) Annual Integrity Test at Launch Site		7
	(d) Separator Bolt Lot Acceptance Test (LAT)		10
4.	Seals	VIT500-18.049	3**
		VIT500-13.275	3**

**Total of three each to be maintained in stock at all times to support testing.

5.	Hardware required to support implementation of the 4 and 7 year ordnance testing for the GUCA to satisfy NSTS 08060 Specification Document:		
	NASA Standard Initiator for Test of Pressure Cartridges, Separator Bolt Assy (GUCA), PD 5000020	JSC SEB 26100001-216	
	FIRST LOT BUY		
	**1) 4 - Year Test		5 each
	**2) 7 - Year Test		5 each
	SECOND LOT BUY		
	**1) 4 - Year Test		5 each
	**2) 7 - Year Test		5 each

**NOTE: Are to be flight certified

SECTION "E" (Continued)

SPECIAL TEST EQUIPMENT AND TEST TOOLS

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
6. MSFC	VPPA Weld Stations #1 and #2 in Bldg. 4711 Weld Lab		
7. MSFC	Weld Station #3 and #4 Weld Lab in Bldg. 4705 Vertical Tool Area		
8. MSFC	Secured Storage area of 1,000 sq. ft. with forklift access in MSFC Bldg. 4711 Weld Laboratory		
9. MSFC	Bldg. 4711 X-ray Facility		
	X-ray Machine	NASA Bar Code #G29940	1
	X-ray Film Processor	NASA Bar Code #733241	1
10. MSFC	CNC Milling Machine	NASA Bar Code #1151613	1
	Bridgeport Mill in Bldg. 4711 Weld Laboratory	NASA Bar Code #102331	1
11. MSFC	Delta Qualification Test hardware		
	Linear Shaped Charge (LSC)	PD5000016-050	1
	from KSC surplus stock	PD5000016-059	1
12. MSFC	Vertical Weld Pedestals	30A72341	8
		30A72283-5-101	2

SECTION "F"

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
1.	Component Data package for all items in Section "G" (to include each applicable item of the following documentation or notation that the requirement is not applicable.) A. Component Log Book B. Identification of Limited Life/Time or Age Sensitive Items C. Time and Cycle Data D. Waivers and Deviations E. Quality Acceptance Reports F. Traceability Data for Parts & Material Control G. Calibration Curves H. Temporary Installations I. LO2 Compatibility Batch Test Certification J. Open Discrepancy/Failure Reports or Waivers K. Applicable Open NASA Alerts L. Shortages M. Continuity and Isolation Resistance Test Data for the Connector Saver for Items No. 1, Section "H"		1 set w/each hardware component delivered
2.	Certificate of Qualification/equivalent certification for all items listed in Section "G".		1 COQ for ea. item identified in Section "G".

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
3.	Space Shuttle Mass Properties Status Report	SD72-SH-0120	1 Set
4.	SRB MASS Properties Status Report		1 Set
5.	System Math Model Format		1 Set
6.	MSFC Facilities Test Equipment Drawings		1 Set
7.	KSC Launch Operations Information		1 Set
	A. Integrated Test Procedures B. Test & Flight Reports C. Integrated Checkout, Control and Launch Systems Data (LPS System Design Definition)		1 Set
8.	Shuttle Integrated Measurement List		1 Copy
9.	EEE Parts Selection & Application Guidelines for Space Shuttle		6 Sets
10.	KSC Propellant Loading System Control Block Diagram & Logic Design Data		1 Set

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
11.	All NSTS 07700 Primary and Secondary Documents		1 Copy w/Updates
12.	Government Furnished ET Components (GFP Flight Hardware in Section "G")		
	A. Procurement Drawings & Changes		1 Set w/Updates (Reproducible)
	B. Production Drawings & Changes		1 Set w/Updates (Reproducible)
	C. Specifications (including EEE & Mechanical Parts) 1) List of all Gov't Specs. 2) Copies of all Vendor Specs.		1 Set w/updates (Reproducible)
	D. Identification of STE, TSE & CFE Required for Handling, Inspection, Installation, Maintenance & Checkout		1 Set w/Updates (Reproducible)
	E. Procedures for Handling, Storage, Checkout, Mounting, Installation Normal Maintenance, Removal, Replacement, Repair & Cleaning		1 Set w/Updates (Reproducible)
	F. Safety Requirements		1 Set w/Updates (Reproducible)

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
13.	SSP Level I & II Change Paper (PRCBDs, Change Request, IRNs, PIRNs, NSTS 07700 changes, letter request, etc.)	N/A	As Issued
14.	Structural Design Load Data Book	SD-73-SH-0069-3D & Updates as Issued	As Issued
15.	LO2 Propellant Mass Load	TBD	
16.	All GSE Dwgs. & Specifications for Aft Umbilical Carrier Plate Protective Covers (P/N C78-5200 & C78-5201)	TBD	1 Set
17.	Tooling Drawings for Aft Support Structure Orbiter/ET Interface Control Tool (P/N T7210012)	N/A	1 Set

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
18.	Reproducible Drawings for Adapter Assy., Electrical Connector, MSFC #14A00635-1, Rev. B or USBI Dwg. 1076-0002-101	Dwg #14A00635, Rev. B Dwg #14A00646, Rev. A, EO-1 Dwg #14A00647, Rev. A Dwg #14A00648, Basic (Plus any revisions thereto)	1 Set
19.	GSE Drawing & Usage Instruction for Special Tool (Device) for Actuation of 17" Q/D Valve	TBD	1 Set
20.	Space Shuttle Performance Enhancement Certification Aerodynamics Heating Data Book, Superlightweight Tank, Ascent	RI Report SSD 95D0489 with appropriate updates	1
21.	Space Shuttle Performance Enhancement Certification Generic Plume Heating Data Book, External Tank - Ascent	RI Report SSD 96D0343 with appropriate updates	1
22.	Data Required to Perform the Analysis for ET Entry Breakup & Debris Disposal.		1 Set NSTS-07700-10-MVP-01
	A. Ascent Environments - Base		1 Set
	B. Entry Trajectories - Base		1 Set

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
23.	Loads Definition Data to include the following plus updates:		
	A. Updated Critical Design Loads, Document in Updated Loads Data Book STS-85-0169, Vol. 3 (Received NASA/MSFC Letter GP43-71-94 dated 8-12-94) with appropriate updates		1 Set
	B. Updated Final Design Loads for incorporating into "SLWT Structural Load Indicators and Capabilities" (Algorithms)		1 Set
	C. Ullage pressure updates due to SLWT performance or other operations unique to SLWT. Incorporate in updated ICD-2-12001 and ICD-2-0A002.		1 Set

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
24.	Ascent Data (Worst Case Nominal, TAL, 3RTLS) to include the following:		
	A. Ascent Trajectories, Updates to trajectories defined in RI letter 90MA-4385 and JSC letter WE2-91-113 with appropriate updates		1 set*
	B. Appropriate updates to SSD 90D0016 (ET Plume heating Data Book)		1 set*
	C. Appropriate updates to STS 90 D0336 (ET Aerodynamics Heating Data Book)		1 set*
	D. Appropriate updates to SSD 9700271 for Thermal Interface Design Data with appropriate updates		1 set*
	E. Ascent Venting Trajectories		1 set*
	F. MPS Ascent Trajectory Set		1 set*
	G. Nominal Ascent Aero Heating and Plume Heating Definition for Use in Disposal Certification		1 set*

* Schedule dates required will be incorporated into the Schedule Interface Log (SIL).

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
25.	Entry Data to include the following:		
	A. Appropriate updates to Entry Trajectory Data Sets for TAL.		1 set*
	B. Appropriate updates to Entry Trajectory Data Sets for RTLS.		1 set*
	C. Appropriate updates to Entry Heating Trajectory Data Sets for No-Fail (Nominal Heating).		1 set*
26.	FMEA & CIL (Part Level for Critical Items) 1) ET/ORB EIFA 2) SRB/ORB EIFA 3) Orbiter MPS FMEA/CIL 4) Separation System FMEA/CIL 5) 17" Disconnect (Supplier FMEA) 6) Feedline Manifold Upstream of Prevalves Supplier FMEA 7) 4" Disconnect (Supplier FMEA) 8) 2" Disconnect (Supplier FMEA) 9) ET Ullage Pressure Signal Conditioner (Supplier FMEA) 10) SRB FMEA 11) SRB CIL		1 set w/updates (Reproducible)*

* Schedule dates required will be incorporated into the Schedule Interface Log (SIL)

SECTION "F" (Continued)

DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
27.	Test reports required to support qualification test and checkout of the new hose liners for LO2/LH2 Ullage Titeflex hoses		
	A. LOX Compatible Samples at MSFC	N/A	1 ea*
	B. Nomex Coverings Flammability Samples at MSFC	N/A	1 ea*
	C. Qualification Test Report for Flex Hoses	N/A	1 ea*
28.	Test reports required to support Hot Gas Testing for Re-qualifying Graphite Epoxy Material		
	A. Hot Gas Test of PrePreg Material	N/A	1 ea*
	B. Hot Gas Test of Hexcel Material	N/A	1 ea*
29.	Test reports required after testing at NASA/MSFC and AMES test facilities to support qualification of the BX-265 Material:		
	A. Process and Qualification Test for BX-265 (Lot 3) Material at MSFC and AMES	N/A	1 ea*
	B. Flight Support Requirements for BX-265 (Lot 3) Material at MSFC and AMES	N/A	1 ea*
	C. Process and Qualification for BX-265 (Lot 4) Material at MSFC and AMES	N/A	1 ea*

- Test results are required four weeks after the actual tests are performed

* Schedule dates required will be incorporated into the Schedule Interface Log (SIL)

SECTION "F" (Continued)
DOCUMENTATION

ITEM NO.	NOMENCLATURE	IDENT. NO., PART NO., DRAWING NO. OR REQUIREMENT DESCRIPTION	QUANTITY
30.	Test reports required after Testing at NASA/MSFC and AMES test facilities and necessary hardware to perform the required testing for the implementation of NCFI 27-68		
	A. Process and Qualification Test Hot Gas Test Facility	N/A	1 ea*
	35 Nominal, 12 Thick/Thin Fab LH2 Test Specimens 6 High, 6 LowFab LO2 Ogive Test Specimens 15 Vented, 15 Not Vented Fab I/T Test Specimens		
	B. Test Fab Specimen Thermal Acoustics Testing Supporting the Implementation of NCFI 27-68	N/A	1 ea*
	3 Nominal Fab Test Specimens		
	C. Test Fab Specimen Vacuum Chamber Testing Supporting the Implementation of NCFI 27-68	N/A	1 ea*
	12 Nominal, 8 Thick/Thin/Flat/Vented Fab Test Specimens 8 Flat/Vented Fab Test Specimens 20 Flat Vented, 10 Ribbed/10 Hat/Fab Test Specimens		
	D. Test Specimen Sprays Flammability Testing Supporting the Implementation of NCFI 27-68	N/A	1 ea
	3 Nominal Fab/Cure LH2 Flammability Test 6 Nominal Fab/Cure LH2 Flammability Test		
	E. Test Specimen for Lot 3 Qualification Testing supporting the Implementation of NCFI 27-68	N/A	1 ea
	3 Nominal Fab/Cure LH2 Combined Env. Test Specimens		

* Test results are required four weeks after the actual tests are performed

SECTION "G"

FLIGHT ARTICLE HARDWARE

NOTE:
1. THIS SECTION CONTAINS GFP FLIGHT HARDWARE REQUIREMENTS FOR ET-61 THROUGH 121.
2. THE NEED DATES FOR THE HARDWARE LISTED IN THIS SECTION SHALL BE MUTUALLY AGREED TO BY MSFC AND LOCKHEED MARTIN AND ARE REFLECTED IN THE EXTERNAL TANK PROJECT SCHEDULE INTERFACE LOG.

ITEM NO.	NOMENCLATURE AND PART NO.	FLIGHT ARTICLES	SPARES	TOTAL	DELIVER TO
1.	Umbilical Carrier Plate Assembly				
A.	LH2 Disconnect* V527-415267-037 V527-415267-044 V527-415267-045 V527-415267-048 V527-415267-050 V527-415267-052 V527-415267-055 V527-415267-056 V527-415267-057	35	**	35	MAF
B.	LO2 Disconnect* V527-415273-031 V527-415273-032 V527-415273-033 V527-415273-035 V527-415273-036 V527-415273-037 V527-415273-038	35	**	35	MAF
2.	Seals (To support installation of Item 1 above)				
A.	P/N ME 261-0045-0017		6***		MAF
B.	P/N ME 261-0045-0006		5***		MAF
C.	P/N ME 261-0045-0023		5***		MAF
D.	P/N ME 261-0045-0019		5***		MAF

SECTION "G" (Continued)

FLIGHT ARTICLE HARDWARE

ITEM NO.	NOMENCLATURE AND PART NO.	FLIGHT ARTICLES	SPARES	TOTAL	DELIVER TO
3.	NSI Standard Initiator (P/N SEB 26100001-261) (2 ea.) (GUCA)	70	14	84	Hishear
4.	ET/SRB Forward Attachment Bolt Catcher P/N 30A90901 or 10175-0001-101 or 10175-0001-102; P/N 10175-0001-103	70	2	72	MAF
5.	Rosan Inserts				
	A. P/N SR258L-0024			112****	MAF
	B. P/N 5753270-108			48****	MAF
6.	Seal P/N ME261-0033-0202 to support inspection of leak ports on the LO2/LH2 Umbilical Assys. (Boeing North American to supply upon request)	50	-	50	MAF

* All subtier parts and assemblies are listed in the Lockheed Martin Schedule Interface Log (SIL) and reflect the current approved configuration. Also, the SIL will continue to reflect appropriate effectivities.
** Minimum two build ahead units to be available in stock.
*** To be available in stock at all times.
**** Minimum quantity to be available in stock at all times at MAF.

SECTION "H"

TELECOMMUNICATIONS

ITEM NO.	NOMENCLATURE
1.	All telecommunications services required to operate the MAF. This includes historically provided telecommunications services such as telephone systems, radio systems, pagers, cell phones, fax machines, data circuits, Emergency Preparedness Communications system, lease and maintenance of dedicated lines for the Mission Support Room, and utilization of the NASA videoconferencing system.

SECTION "I"

COMPOSITE NOSE CONE MANUFACTURE

ITEM NO.	NOMENCLATURE
1.	Government furnished facilities and equipment at MSFC required for the manufacturing of the composite nose cone as identified in the Contractor's Engineering Change Proposal B01775D-R3 dated June 16, 1995.
2.	Nine (9) reusable shipping containers to protect the nose cone during shipment.

SECTION "J"

GOVERNMENT PROVIDED SERVICES

ITEM NO.	NOMENCLATURE
1.	Friction Plug "Pull" process weld repair allowables as identified in the Friction Plug Welding Allowables and Characterization Test Plan #FPWTP-98-012 Revision F in PCP B81483-R1
2.	Test Facility available to support the qualification of the new hose liners for the LO2/LH2 Ullage Titeflex hoses A. LOX Compatible Samples Testing at MSFC B. Nomex Coverings Flammability Samples Testing C. Qual Test Facility Availability at MSFC D. Conduct qualification Testing at MSFC
3.	Use of Hot Gas Facility to support qualification of the Graphite Epoxy PrePreg Material A. Conduct Test of NASA PrePreg Material at MSFC Hot Gas Test Facility B. Conduct Hot Gas Testing of Hexcel Material at MSFC Hot Gas Facility
4.	Use of NASA/MSFC and AMES Test Facilities to Support Qualification of the BX-265 Material A. Conduct Test Supporting the Process and Qualification for BX-265 (Lot 3) Material at MSFC and AMES B. Conduct Test Supporting the Flight Support Requirements for BX-265 (Lot 3) Material at MSFC and AMES C. Conduct Test Supporting the Process and Qualification for BX-265 (Lot 4) Material at MSFC and AMES

* Schedule dates required will be incorporated into the Schedule Interface Log (SIL)

SECTION "J" (Continued)

GOVERNMENT PROVIDED SERVICES

ITEM NO.	NOMENCLATURE
5.	Use of NASA/MSFC and AMES test facilities and necessary hardware to perform the required testing for the Implementation of NCFI 27-68

A. Conduct Test Specimen Sprays at the Hot Gas Facility Supporting the Process and Implementation of NCFI 27-68

35 Nominal, 12 Thick/Thin Fab LH2 Test Specimens
6 High, 6 Low Fab LO2 Ogive Test Specimens
15 Vented, 15 Not Vented Fab I/T Test Specimens

B. Conduct Test Fab Specimen Thermal Acoustics Testing Supporting the Implementation of NCFI 27-68

3 Nominal Fab Test Specimens

C. Conduct Test Fab Specimen Vacuum Chamber Testing Supporting the Implementation of NCFI 27-68

12 Nominal, 8 Thick/Thin/Flat/Vented Fab Test Specimens
8 Flat/Vented Fab Test Specimens
20 Flat Vented, 10 Ribbed/10 Hat/Fab Test Specimens

D. Conduct Test Specimen Sprays Flammability Testing Supporting the Implementation of NCFI 27-68

3 Nominal Fab/Cure Flammability Test Specimens
6 Nominal Fab/Cure LH2 Flammability Test

E. Conduct Test Specimen for Lot 3 Qual Testing Supporting the Implementation of NCFI 27-68

3 Nominal Fab/Cure LH2 Combined Env. Test Specimens

* Dates Required: Schedule dates required will be incorporated into the Schedule Interface Log (SIL)

Attachment J-5-A

External Tank Production Fee Plan

Introduction

The Production portion of this contract is composed of a Target Fee, Cost Incentive Fee, Award Fee, Performance Incentive Fee, and Fixed Fee structure, which supports the primary goals of the NASA Space Flight Program: Fly Safely, Meeting the Flight Manifest, Improve Mission Supportability, and Improve the System. This fee plan emphasizes excellence in managerial, technical, schedule and cost performance.

1 Award Fee Provisions

1.1 Criteria will be established to evaluate the effectiveness of the Contractor in the Quality Control and Management Performance areas for the production and delivery of External Tanks ET-122 through ET-156.

1.2 The Quality Control criteria will represent 70% of the Award Fee and Management Performance criteria will represent 30% of the Award Fee. The criteria will be utilized to measure the Contractor's performance in meeting the technical objectives of the program and accomplishing quality work. The criteria will be chosen to meet the objectives. No later than thirty (30) days prior to the start of an evaluation period, the Government may issue a unilateral modification to change the criteria weighting identified above.

1.3 Not later than thirty (30) calendar days prior to the start of each evaluation period, the Contractor will be notified by the Contracting Officer of the desired areas of emphasis, key events, and the evaluation criteria selected for application to the specific evaluation period. Consideration will be given to the Contractor's recommendations; however, it is the Government's responsibility to establish the specific areas of work to be emphasized and the detailed criteria to be used for each evaluation period. The Performance Incentive criteria identified in Paragraph 4 of this attachment are excluded from the Award Fee evaluations, except that systemic problems that cause loss of like performance incentives may be evaluated within Award Fee ratings.

1.4 Within ten (10) calendar days subsequent to any evaluation period, the Contractor may provide a written report of accomplishments to the Contracting Officer to support an analysis of the Contractor's performance under the established criteria set forth in Paragraph 1.3 above. Award Fee evaluations shall be accomplished in accordance with the NASA Marshall Working Instruction (MWI) 5116.1 "Evaluation of Contractor Performance under Contracts with Award Fee Provisions."

1.5 The total Award Fee Pool and Period apportionment are set forth in Enclosure (1) to this Attachment.

1.6 Evaluation Scale and Adjective Rating

1.6.1 The Award Fee Rating Table in Enclosure (2) includes the adjective ratings as well as a numerical scoring system from 0-100. For this plan, earned award fee dollars are calculated by applying the total numerical score to available dollars for each Award Fee evaluation period. For example, a numerical score of 85 yields 85 percent of available award fee dollars for that period. However a score of less than 61 will result in a loss of all Award Fee for that period.

1.7 Provisional Payment of Award Fee

1.7.1 Commencing with the first day of each evaluation period, 80 percent of the available Award Fee for each Award Fee evaluation period will be provisionally paid to the Contractor in equal monthly installments, upon receipt of the contractor's invoices, subject to the limitation set forth in 1.7.2 below.

1.7.2 Should at any time the contracting officer determine that the contractor will not achieve a level of performance commensurate with the provisional rate, such rate may be reduced. The Contracting Officer shall notify the Contractor, in writing, if it's determined that a reduction is to be made.

1.7.3 All provisional award fee payments will be superseded by the periodic evaluation. If the Fee Determination Officer's (FDO) determination for a period results in earned award fee above that provisionally provided, the Contracting Officer will issue a unilateral modification to recognize such, and payment will be made based upon the unilateral modification. If the amount of award fee earned, as determined by the FDO, is less than the sum of the provisional payments for that period, the Contracting Officer will issue a unilateral modification to recognize such and the Contractor will credit the next payment voucher for the amount over-paid.

1.7.4 In the event this contract is terminated prior to a regular scheduled semiannual Award Fee determination, the Award Fee to be paid to the Contractor shall be a pro rata portion of the potential Award Fee.

2 Employee Motivation Program

Paragraph 2 is deactivated effective October 1, 2001

2.1 As identified below, Lockheed Martin Space Systems Company – Michoud Operations employees will share in any earned Award Fees for each evaluation period in which the Award Fee Period Rating is greater than or equal to 84%. A plan for distribution of Award Fee dollars to employees will be provided in data requirement LMC-ET-MA92. The Employees' share of the earned Award Fee period dollars is as follows:

Period Award Fee Rating	Employees Share as a Percent of Earned Period Award Fee Dollars
84% to <85%	1.2%
85% to <86%	2.3%
86% to <87%	3.5%
87% to <88%	4.6%
88% to <89%	5.7%
89% to <90%	6.7%
90% to <91%	7.8%
91% to <92%	8.8%
92% to <93%	9.8%
93% to <94%	10.8%
94% to <95%	11.5%
95% to <96%	12.0%
96% to <97%	12.5%
97% to <98%	13.0%
98% to <99%	13.5%
99% to <100%	14.0%
100%	14.5%

Example Calculation:

Period AF Pool	Period Rating	Total Earned Fee	% to Employees	Employees Share	Contractor Share
$ 4,000,000	95%	$ 3,800,000	12% of Earned	$ 456,000	$3,344,000

3 Target/Cost Incentive Fee Provisions for Production

3.1 The Target/Cost Incentive Fee is based on the Contractor's performance relative to the Target Cost. The Target/Cost Incentive Fee payable under this contract shall be in accordance with the provisions of FAR 52.216-10, subject to the Award Fee gate identified in Paragraph 3.2 herein. The Target Cost and Target Fee are identified in Section B. The contractor will share in cost underrun and overrun to target cost as follows:

3.1.1 Underrun to Target Cost. – The cost incentive payable under this contract shall be the Target Fee increased by 25 cents for every dollar that the total allowable cost subject to this incentive is less than the Target Cost.

3.1.2 Overrun to Target Cost - The cost incentive payable under this contract shall be the Target Fee decreased by 50 cents for every dollar that the total allowable cost subject to the incentive fee exceeds the Target Cost. This arrangement will continue until the Target Fee is exhausted. Fee reductions for overrun will not impact other fees payable under this contract.

3.2 Production Award Fee Gates

3.2.1 In calculating the amount of Target Fee and Cost Incentive Fee earned, the following Award Fee Gates apply. In this paragraph, Target Fee refers to Target Fee unadjusted for cost underrun performance.

Average Award Fee Score at End of Contract*	Potential to Earn Target Fee	Potential to Earn Cost Incentive Fee
85% to 100%	Yes	Yes, no limit
81% to <85%	Yes	Yes, limited to Underrun cap at 12.5% of Target Cost**
61% to <81%	Yes	None
Below 61%	None	None

* Calculation – Total all Award Fee Ratings earned (percentages by period) divided by total number of Award Fee Periods (rounded to the nearest tenth of a percent).

** Cap = 12.5% x Target Cost identified in Section B, paragraph B.2.a; Cap x .25 = Earned Cost Incentive dollar limitation

3.2.2 If the score for any individual Award Fee period is less than a rating of 61%, the Contractor will not earn any Award Fee, Target Fee, or Cost Incentive Fee for that evaluation period.

3.2.2.1 The amount of Target Fee forfeited will be calculated as follows:

Target Fee forfeited equals Contract Value for the six-month evaluation period times Target Fee Percentage earned at complete

Period Contract Value equals period actual cost divided by (100% minus Percent Underrun or 100% plus Percent Overrun achieved at the end of contract)

Target Fee Percentage equals Target Fee earned at complete (adjusted only for Overrun share, if applicable) divided by Target Cost

Example #1: (If actual performance at or below Target Cost)

Assumes:
- Period Actual Cost = $45M
- Target Cost at Complete = $800M
- Actual Cost at Complete = $720M
- Target Fee = $16M
- Target Fee Percentage = 2%

Calculation:
- Underrun Percent at Complete = 10% (($800M-$720M)/$800M))
- Period Contract Value = $50M ($45M / (100% - 10%))
- Target Fee Forfeited = $50M x 2% = $1M
- Target Fee Earned at Complete = $15M ($16M - $1M)

Example #2: (If Overrun performance)

Assumes:
- Period Actual Cost = $45M
- Target Cost at Complete = $800M
- Actual Cost at Complete = $808M
- Target Fee = $16M
- Overrun Shareline = 50/50

Calculation:
- Overrun Percent = (($808M-$800M)/$800M) = 1%
- Period Contract Value = $44.6M
  ($45M / (100% + 1%))
- Target Fee adjusted for Overrun = $12M
  ($16M – ($8M x $0.5))
- Target Fee % adjusted for Overrun = 1.5%
  ($12M/$800M)
- Target Fee forfeited = $44.6M x 1.5% = $0.669M
- Target Fee earned (adjusted for overrun/forfeit)
  ($12M - $0.669M) = $11.331M

3.2.2.2 The amount of Cost Incentive Fee forfeited will be calculated as follows:

[(Period Contract Value minus Period Actual Cost) times $0.25] equals Period Cost Incentive Fee forfeited

Period Contract Value equals period actual cost divided by (100% minus Percent Underrun achieved at the end of contract)

Example of Cost Incentive Fee Calculation:

Assumes:
- Period Actual Cost = $45M
- Target Cost at Complete = $800M
- Actual Cost at Complete = $720M
- Underrun Shareline = 75/25

Calculation:
- Underrun Percent at Complete = 10%
  (($800M-$720M)/$800M)
- Period Contract Value = $50M
  ($45M / (100% - 10%))
- Period Underrun = $50M - $45M = $5M
- Period Cost Incentive Fee forfeited
  ($5M x $0.25) = $1.25M
- Cost Incentive Fee earned
  ($800M - $720M) x $0.25)) - $1.25M = $18.75M

4 Performance Incentive Fee (PIF) Provisions

4.1 The goal of the performance incentive is to motivate the Contractor to meet Safety, On-time Delivery, Launch and Flight Success commitments and to meet performance requirements as identified in this contract specifications for the External Tank. Performance Incentive and Award Fee are uniquely and independently derived.

Criteria	Initial Weights of PIF
Safety	30%
On-time Delivery of ET	30%
Successful Launch	10%
Flight Success	30%

4.2 Safety Performance Incentive Fee

4.2.1 Accidents Resulting in Days Away from Work

4.2.1.1 A Performance Incentive Fee pool shall be paid to the Contractor for being at or below the industry average for the frequency rate of Contractor employee work-related accidents, resulting in days away from work. The mutually agreed metric is defined as the greater of 0.6 or the most current published Bureau of Labor Statistics (BLS) twelve-month cumulative rate for the Standard Industrial Classification (SIC) code "3769 – Guided Missiles & Space Vehicle Parts & Auxiliary Equipment" for work-related accidents resulting in days away from work per 200,000 hours worked.

4.2.1.2 If actual performance for any period is at or below the metric identified in the standard referenced above, the Contractor will earn the Performance Incentive Fee assigned to that period in accordance with the calculations below.

Actual Period Performance equals:

$$\frac{\text{\# of Accidents (as defined in 4.2.1.1) X 200,000}}{\text{Total Hours Worked}}$$

Performance as a percent of Standard equals:

$$\frac{\text{Actual Period Performance}}{\text{Metric as defined in 4.2.1.1}}$$

Actual Period Performance Achieved as a % of Standard (rounded to the nearest tenth of a percent)	% Period Performance Incentive Fee Pool Earned
0% - 50%	100%
>50% -75%	50%
>75% – 100%	25%
Exceeds Standard	0%

4.2.2 Incidents with Cost Impact

4.2.2.1 A Performance Incentive Fee pool shall be paid to the Contractor for performing at or below the metric as defined in 4.2.1.1 for the frequency rate of NASA-reportable incidents (hardware damage) as defined in MMC-ET-RA03. Only incidents resulting in a cost impact equal to or greater than $5,000, for which the Contractor is solely responsible, will be included in calculating Actual Period Performance. Cost impact will be determined in accordance with established safety performance evaluation methodology.

4.2.2.2 If actual performance for any period is at or below the BLS metric referenced above, the Contractor will earn the Performance Incentive Fee assigned to that period in accordance with the calculations below.

Actual Period Performance equals:

$$\frac{\text{\# of Incidents (as defined in 4.2.2.1) X 200,000}}{\text{Total Hours Worked}}$$

Performance as a percent of Standard equals:

$$\frac{\text{Actual Period Performance}}{\text{Metric as defined in 4.2.1.1}}$$

Actual Period Performance Achieved as a % of Standard (rounded to nearest tenth of a percent)	% Period Performance Incentive Fee Pool Earned
0% - 50%	100%
>50% -75%	50%
>75% – 100%	25%
Exceed Standard	0%

4.2.3 Enclosure (3) to this Attachment identifies the periods and available fee for each period. Once the Safety Performance Incentive Fee is earned, it is not subject to recoupment.

4.3 On-time Delivery Performance Incentive Fee

4.3.1 A Performance Incentive Fee will be paid to the contractor for meeting the successful delivery criteria as defined below. The Performance Incentive Fee payable is identified in Enclosure (4) to this Attachment.

4.3.2 Acceptance of the External Tank is defined as delivery of the External Tank in compliance with the Specification as identified in Section C, Paragraph C.2 of this contract, excluding open work, and as modified by Waivers, Deviations or other appropriate method as demonstrated by the executed DD-250.

4.3.3 The On-time Delivery Performance Incentive Fee for each External Tank is earned by the contractor upon Government acceptance (executed DD250) on or before the delivery date identified in Attachment J-7-A of this contract. In the event an External Tank is available for acceptance on or before the delivery date, but the Government requires a delay in executing the DD250, the fee will be considered earned upon execution of the DD250.

4.4 Successful Launch Performance Incentive Fee

4.4.1 A Performance Incentive Fee as identified in Enclosure (5) to this Attachment will be paid to the Contractor for the "Successful Launch" of each External Tank during the period of performance of this contract according to the criteria identified below.

4.4.2 This criterion covers the performance of External Tank Hardware for the period beginning after Government

acceptance (DD250) at MAF through T minus 0 seconds. Successful Launch Performance is defined as External Tank Hardware performance which is solely and conclusively attributable to the Contractor during this period and which does not result in the scrub of a planned launch. Scrub is defined as a launch delay past the scheduled launch window, into the following day(s).

4.4.3 The Successful Launch Performance Incentive Fee identified in Enclosure (5) will be earned after each "Successful Launch". For External Tanks delivered but not flown within 24 months after the respective DD250 date, 100% of the allocated performance incentive fee for each unflown tank will be converted to 100% Fixed Fee and paid to the Contractor.

4.4.4 External Tank Hardware is flight hardware, procured pursuant to this contract, excluding GFP, that has not been modified or altered in an unauthorized manner subsequent to its acceptance by the Government (DD250 form at MAF), and has not been improperly serviced or maintained.

4.5 Flight Success of External Tank Performance Incentive Fee

4.5.1 A Flight Success Performance Incentive Fee as identified in Enclosure (6) to this Attachment will be paid to the contractor for the "Successful Flight" of External Tank Hardware produced under this contract according to the criteria identified below.

4.5.2 For purposes of Flight Success Performance Incentive Fee, "Successful Flight" is defined as the performance of External Tank Hardware that does not warrant a Category I or II failure determination pursuant to the definitions in Section B Paragraph B.5 of this contract.

4.5.3 The Flight Success Performance Incentive Fee identified in Enclosure (6) will be earned after each "Successful Flight". For External Tanks delivered but not flown within 24 months after the respective DD250 date, 100% of the allocated performance incentive fee for each unflown tank will be converted to 100% Fixed Fee and paid to the Contractor.

4.5.4 In-Flight Anomaly

If the flight meets the definition for successful flight above (4.5.2), but an In-Flight Anomaly (IFA) occurs which is solely and conclusively attributable to the contractor by the failure of the tank to be compliant with the Specification identified in Section C, Paragraph C.2 of this contract, as modified by waivers, deviations, or other appropriate method the Flight Success Incentive fee for that mission and that mission only will be reduced as follows:

IFA's	Percent of Flight Success Performance Fee Earned
0	100%
1	50%
2 or more	0%

4.6 Payment of Performance Incentive Fee

The contractor shall notify the Contracting Officer after completion of each identified event. The Financial Management Office upon receipt of the Contractor's Public Voucher will make payment to the Contractor.

4.7 Provisional Payment of the Performance Incentive Fee

4.7.1 The Contractor may voucher and the government will provisionally pay 80 percent of the available Performance Incentive Fee for Safety, On-Time Delivery, Successful Launch, and Flight Success. The payment will be provisionally paid to the contractor as follows.

4.7.1.1 Commencing with the first month of each annual evaluation period, 80 percent of the available Safety Performance Incentive Fee for each evaluation period will be provisionally paid to the contractor in equal monthly installments upon receipt of the contractor's invoice, subject to limitation set forth in paragraph 1.7.2.

4.7.1.2 Commencing with the actual start of the LH2 Aft Dome for each External Tank, the Contractor will be provisionally paid 20 percent of the available On-Time Delivery Performance Incentive Fee for accomplishing each External Tank milestone identified below (Project Milestone Schedule line number in parentheses):

Start LH2 Aft Dome (L4)
Start LH2 Major Weld (L6)
LH2 Post-Proof NDE Complete (L7)
ET Splice Complete (L13)

4.7.1.3 Commencing with the actual start of the LH2 Major Weld for each External Tank, the Contractor will be provisionally paid 20 percent of the available Successful Launch Performance Incentive Fee and 20 percent of the available Flight Success Incentive Fee for accomplishing each External Tank milestone

identified below (Project Milestone Schedule line number in parentheses):

Start LH2 Major Weld (L6)
LH2 Post-Proof NDE Complete (L7)
ET Splice Complete (L13)
Six-months after DD250 date

4.7.1.4 For any External Tank that does not launch within 12 months of the respective DD250 date, Contractor will be provisionally paid upon receipt of the Contractor's invoice the remaining 20% of the available Successful Launch and Flight Success Performance Incentive Fees for that External Tank, bringing the total provisional payments for that particular External Tank to 100%.

4.7.2 Any provisionally paid performance Incentive fees will be credited in the next fee voucher if the contractor does not meet the Performance Incentive Criteria.

4.8 Performance Incentive Fee Penalties Post DD-250

For the period from DD-250 to T minus 0, the Contractor will be assessed a penalty of $275,000 if the tank is found not to be useable for a Space Shuttle Launch. This is defined that the External Tank is not in accordance with the specification identified in Section C, Paragraph C.2 of this contract as modified by Waivers, Deviations, or other appropriate method and can not be repaired by the contractor and such condition is solely and conclusively, attributable to the Contractor, such that the External Tank may not be used for Space Shuttle Launch.

4.9 Paperless Manufacturing Execution System (PMES):

Objective	Amount Apportioned	Earned Amount
PMES operational on or before September 27, 2003	$297,794	

4.9.1 The goal of the performance incentive is to motivate the Contractor to meet the schedule and technical performance requirements of this Project. The Contractor will earn and be paid this Performance Incentive Fee when a system for

processing new work orders and non-conformances on the shop floor utilizing the PMES software is operational in the following production areas on or before September 27, 2003. Production areas include, (1) Weld Subassembly Area I, (2) Weld Subassembly Area II, (3) Weld Subassembly Area III, (4) Mechanical Assembly, (5) Final Assembly Positions 1-4, (6) Test and Checkout (Bldg. 420), (7) Vertical Assembly Building (Bldg. 110), (8) High Bay (Bldg. 114), (9) Buildings 451/452, (10) Building 131, Cell "P", (11) Detail Fabrication Areas (Machine Shop, SOFI Shop, and Harness Fabrication), (12) Building 318, and (13) Mix Rooms in Buildings 130/131. If there are unforeseen subcontractor problems, this date will be revised by mutual agreement of the parties.

4.9.2 Payment of Performance Incentive Fee for PMES

The Contractor shall notify the Contracting Officer after completion of the identified event. The Financial Management Office upon receipt of the Contractor's Public Voucher will make payment to the Contractor. Once the Performance Incentive Fee is earned, it is not subject to recoupment. Failure to meet the Performance Incentive Fee objective must be solely and conclusively attributable to the performance of the Contractor to determine a Performance Incentive Fee to be unearned.

4.9.3 Provisional Payment of Performance Incentive Fee for PMES

4.9.3.1 The Contractor may voucher and the Government will provisionally pay 80 percent of the available Performance Incentive Fee. The payment will be provisionally paid to the Contractor as identified below.

4.9.3.2 Commencing with the first day of the 2nd Quarter of Calendar Year 2003 (2Q CY03), 80 percent of the available fee for the Performance Incentive objective will be provisionally paid to the Contractor in equal quarterly installments upon receipt of the Contractor's invoice, subject to the limitation set forth in paragraph 1.7.2 of this attachment.

4.9.3.3 Any provisionally paid Performance Incentive fee will be credited in the next fee voucher if the Contractor does not meet the Performance Incentive Criteria.

5 Fixed Fee

The total fixed fee of $ 780,300 for Production effort shall be payable upon the execution of this contract. This fixed fee is for the period of performance of September 27, 1999 through September 30, 2000.

Enclosure (1) to Attachment J-5-A

Production Award Fee Pools							
Period	**Previous Amount Apportioned**	**Increase/ Decrease**	**New Apportionment**	**Earned Amount**	**Earned Percent**	**Mod #**
October 1, 2000 - March 31, 2001	$ 1,499,664	$ 0	$ 0	$ 1,370,693	91.40%	022
April 1, 2001 - September 30, 2001	$ 2,493,361	$ 0	$ 0	$ 2,202,136	88.32%	038
October 1, 2001 - March 31, 2002	$ 3,273,186	$ 0	$ 0	$ 3,070,903	93.82%	052
April 1, 2002 - September 30, 2002	$ 2,498,684	$ 0	$ 0	$ 2,296,290	91.90%	068
October 1, 2002 - March 31, 2003	$ 3,869,381	$ 694	$ 3,870,075			
April 1, 2003 - September 30, 2003	$ 3,850,851	$ 5,617	$ 3,856,468			
October 1, 2003 - March 31, 2004	$ 3,561,660	$ 0	$ 3,561,660			
April 1, 2004 - September 30, 2004	$ 3,659,398	$ 0	$ 3,659,398			
October 1, 2004 - March 31, 2005	$ 3,745,939	$ 0	$ 3,745,939			
April 1, 2005 - September 30, 2005	$ 3,773,638	$ 0	$ 3,773,638			
October 1, 2005 - March 31, 2006	$ 3,643,854	$ 0	$ 3,643,854			
April 1, 2006 - September 30, 2006	$ 3,625,946	$ 0	$ 3,625,946			
October 1, 2006 - March 31, 2007	$ 3,841,277	$ 0	$ 3,841,277			
April 1, 2007 - September 30, 2007	$ 3,078,315	$ 0	$ 3,078,315			
October 1, 2007 - March 31, 2008	$ 2,037,730	$ 0	$ 2,037,730			
April 1, 2008 - December 01, 2008	$ 1,311,308	$ 0	$ 1,311,308			
Total	$ 49,764,192	$ 6,311	$ 40,005,608	$ 8,940,022		

Adjective Rating	Range of Points	Description
Excellent	100 – 91	Of exceptional merit; exemplary performance in a timely manner, efficient manner; performance meets or exceeds contract requirements; very minor (if any) deficiencies with no adverse effect on over all performance.
Very Good	90 – 81	Effective performance; requirements accomplished in a timely manner for the most part; substantially exceeds minimum contract requirements with only minor deficiencies.
Good	80 – 71	Effective performance; exceeds minimum contract requirements; reportable deficiencies, but with little identifiable effect on overall performance.
Satisfactory	70 – 61	Effective performance; exceeds minimum contract requirements; reportable deficiencies with identifiable, but not substantial effects on overall performance.
Poor/ Unsatisfactory	60 - 0	Overall performance does not meet minimum contract requirements; remedial action required in one or more areas; numerous deficiencies which adversely affect performance.

Enclosure (3) to Attachment J-5-A

Safety Performance Incentive Fee Pools						
Period	**Previous Amount Apportioned**	**Increase/ Decrease**	**New Apportionment**		**Earned Amount**	**Earned Percent**
Days Away from Work Accident Cases (4.2.1)						
October 1, 1999 – September 30, 2000	$ 111,178	$ 0	$ 111,178		$111,178	100%
October 1, 2000 – September 30, 2001	$ 694,803	$ 0	$ 694,803		$694,803	100%
October 1, 2001 – September 30, 2002	$ 763,068	$ 0	$ 763,068		$763,068	100%
October 1, 2002 – September 30, 2003	$ 873,854	$ 2,664	$ 876,518			
October 1, 2003 – September 30, 2004	$ 770,833	$ 0	$ 770,833			
October 1, 2004 – September 30, 2005	$ 873,808	$ 0	$ 873,808			
October 1, 2005 – September 30, 2006	$ 1,013,107	$ 0	$ 1,013,107			
October 1, 2006 – September 30, 2007	$ 790,516	$ 0	$ 790,516			
October 1, 2007 – September 30, 2008	$ 382,486	$ 0	$ 382,486			
Total (4.2.1)	$ 6,273,653	$ 2,664	$ 6,276,317		$1,569,049	
Incidents with Cost Impact > $5,000 (4.2.2)						
October 1, 1999 – September 30, 2000	$ 111,179	$ 0	$ 111,179		$111,179	100%
October 1, 2000 – September 30, 2001	$ 694,801	$ 0	$ 694,801		$694,801	100%
October 1, 2001 – September 30, 2002	$ 763,065	$ 0	$ 763,065		$763,065	100%
October 1, 2002 – September 30, 2003	$ 873,854	$ 2,665	$ 876,519			
October 1, 2003 – September 30, 2004	$ 770,833	$ 0	$ 770,833			
October 1, 2004 – September 30, 2005	$ 873,808	$ 0	$ 873,808			
October 1, 2005 – September 30, 2006	$ 1,013,106	$ 0	$ 1,013,106			
October 1, 2006 – September 30, 2007	$ 790,516	$ 0	$ 790,516			
October 1, 2007 – September 30, 2008	$ 382,486	$ 0	$ 382,486			
Total (4.2.2)	$ 6,273,648	$ 2,665	$ 6,276,313		$1,569,045	

Enclosure (4) to Attachment J-5-A

Delivery Performance Incentive Fee Pools

ET#	Previous Amount Apportioned	Increase/ Decrease	New Apportionment		Earned Amount
ET-122	$ 354,099	$ 0	$ 354,099		$ 354,099
ET-123	$ 354,099	$ 0	$ 354,099		
ET-124	$ 354,099	$ 0	$ 354,099		
ET-125	$ 354,099	$ 0	$ 354,099		
ET-126	$ 354,099	$ 0	$ 354,099		
ET-127	$ 354,100	$ 0	$ 354,100		
ET-128	$ 346,819	$ 0	$ 346,819		
ET-129	$ 346,819	$ 0	$ 346,819		
ET-130	$ 346,819	$ 0	$ 346,819		
ET-131	$ 346,819	$ 0	$ 346,819		
ET-132	$ 346,819	$ 0	$ 346,819		
ET-133	$ 346,819	$ 0	$ 346,819		
ET-134	$ 346,819	$ 0	$ 346,819		
ET-135	$ 346,819	$ 0	$ 346,819		
ET-136	$ 346,819	$ 0	$ 346,819		
ET-137	$ 346,819	$ 0	$ 346,819		
ET-138	$ 346,819	$ 0	$ 346,819		
ET-139	$ 346,819	$ 0	$ 346,819		
ET-140	$ 346,819	$ 0	$ 346,819		
ET-141	$ 346,819	$ 0	$ 346,819		
ET-142	$ 346,819	$ 0	$ 346,819		
ET-143	$ 346,819	$ 0	$ 346,819		
ET-144	$ 346,819	$ 0	$ 346,819		
ET-145	$ 346,819	$ 0	$ 346,819		
ET-146	$ 346,819	$ 0	$ 346,819		
ET-147	$ 346,819	$ 0	$ 346,819		
ET-148	$ 346,819	$ 0	$ 346,819		
ET-149	$ 346,819	$ 0	$ 346,819		
ET-150	$ 346,819	$ 0	$ 346,819		
ET-151	$ 346,819	$ 0	$ 346,819		
ET-152	$ 346,819	$ 0	$ 346,819		
ET-153	$ 346,819	$ 0	$ 346,819		
ET-154	$ 346,819	$ 0	$ 346,819		
ET-155	$ 346,819	$ 0	$ 346,819		
ET-156	$ 346,851	$ 0	$ 346,851		
Total	$ 12,182,378	$ 0	$ 12,182,378		$ 354,099

Enclosure (5) to Attachment J-5-A

Successful Launch Performance Incentive Fee Pools

ET#	Previous Amount Apportioned	Increase/ Decrease	New Apportionment		Earned Amount
ET-122	$ 114,857	$ 4,489	$ 119,346		
ET-123	$ 114,857	$ 0	$ 114,857		
ET-124	$ 114,857	$ 0	$ 114,857		
ET-125	$ 114,857	$ 0	$ 114,857		
ET-126	$ 114,857	$ 0	$ 114,857		
ET-127	$ 114,857	$ 0	$ 114,857		
ET-128	$ 114,857	$ 0	$ 114,857		
ET-129	$ 114,857	$ 0	$ 114,857		
ET-130	$ 114,857	$ 0	$ 114,857		
ET-131	$ 114,857	$ 0	$ 114,857		
ET-132	$ 114,857	$ 0	$ 114,857		
ET-133	$ 114,857	$ 0	$ 114,857		
ET-134	$ 114,857	$ 0	$ 114,857		
ET-135	$ 114,857	$ 0	$ 114,857		
ET-136	$ 114,857	$ 0	$ 114,857		
ET-137	$ 114,857	$ 0	$ 114,857		
ET-138	$ 114,857	$ 0	$ 114,857		
ET-139	$ 114,857	$ 0	$ 114,857		
ET-140	$ 114,857	$ 0	$ 114,857		
ET-141	$ 114,857	$ 0	$ 114,857		
ET-142	$ 114,857	$ 0	$ 114,857		
ET-143	$ 114,857	$ 0	$ 114,857		
ET-144	$ 114,857	$ 0	$ 114,857		
ET-145	$ 114,857	$ 0	$ 114,857		
ET-146	$ 114,857	$ 0	$ 114,857		
ET-147	$ 114,857	$ 0	$ 114,857		
ET-148	$ 114,857	$ 0	$ 114,857		
ET-149	$ 114,857	$ 0	$ 114,857		
ET-150	$ 114,857	$ 0	$ 114,857		
ET-151	$ 114,857	$ 0	$ 114,857		
ET-152	$ 114,857	$ 0	$ 114,857		
ET-153	$ 114,857	$ 0	$ 114,857		
ET-154	$ 114,857	$ 0	$ 114,857		
ET-155	$ 114,857	$ 0	$ 114,857		
ET-156	$ 114,873	$ 0	$ 114,873		
Total	$ 4,020,011	$ 4,489	$ 4,024,500		

Enclosure (6) to Attachment J-5-A

Flight Success Performance Incentive Fee Pools

ET#	Previous Amount Apportioned	Increase/ Decrease	New Apportionment		Earned Amount
ET-93	$ 88,889	$ 0	$ 88,889		
ET-94	$ 88,889	$ 0	$ 88,889		
ET-115	$ 88,889	$ 0	$ 88,889		$ 88,889
ET-116	$ 88,889	$ 0	$ 88,889		$ 88,889
ET-117	$ 88,889	$ 0	$ 88,889		
ET-118	$ 88,889	$ 0	$ 88,889		
ET-119	$ 88,889	$ 0	$ 88,889		
ET-120	$ 88,889	$ 0	$ 88,889		
ET-121	$ 88,888	$ 0	$ 88,888		
ET-122	$ 323,329	$ 0	$ 323,329		
ET-123	$ 323,329	$ 0	$ 323,329		
ET-124	$ 323,329	$ 0	$ 323,329		
ET-125	$ 323,329	$ 0	$ 323,329		
ET-126	$ 323,329	$ 0	$ 323,329		
ET-127	$ 323,329	$ 0	$ 323,329		
ET-128	$ 323,329	$ 0	$ 323,329		
ET-129	$ 323,329	$ 0	$ 323,329		
ET-130	$ 323,329	$ 0	$ 323,329		
ET-131	$ 323,329	$ 0	$ 323,329		
ET-132	$ 323,329	$ 0	$ 323,329		
ET-133	$ 323,329	$ 0	$ 323,329		
ET-134	$ 323,329	$ 0	$ 323,329		
ET-135	$ 323,329	$ 0	$ 323,329		
ET-136	$ 323,329	$ 0	$ 323,329		
ET-137	$ 323,329	$ 0	$ 323,329		
ET-138	$ 323,329	$ 0	$ 323,329		
ET-139	$ 323,329	$ 0	$ 323,329		
ET-140	$ 323,329	$ 0	$ 323,329		
ET-141	$ 323,329	$ 0	$ 323,329		
ET-142	$ 323,329	$ 0	$ 323,329		
ET-143	$ 323,329	$ 0	$ 323,329		
ET-144	$ 323,329	$ 0	$ 323,329		
ET-145	$ 323,329	$ 0	$ 323,329		
ET-146	$ 323,329	$ 0	$ 323,329		
ET-147	$ 323,329	$ 0	$ 323,329		
ET-148	$ 323,329	$ 0	$ 323,329		
ET-149	$ 323,329	$ 0	$ 323,329		
ET-150	$ 323,329	$ 0	$ 323,329		
ET-151	$ 323,329	$ 0	$ 323,329		
ET-152	$ 323,329	$ 0	$ 323,329		
ET-153	$ 323,329	$ 0	$ 323,329		
ET-154	$ 323,329	$ 0	$ 323,329		
ET-155	$ 323,329	$ 0	$ 323,329		
ET-156	$ 323,309	$ 0	$ 323,309		
Total	$ 12,116,495	$ -0-	$ 12,116,495		$ 177,778

Award Fee Rating Description

Enclosure (2) to Attachment J-5-B

Adjective Rating	Range of Points	Description
Excellent	100 – 91	Of exceptional merit; exemplary performance in a timely manner, efficient manner; performance meets or exceeds contract requirements; very minor (if any) deficiencies with no adverse effect on over all performance.
Very Good	90 – 81	Effective performance; requirements accomplished in a timely manner for the most part; substantially exceeds minimum contract requirements with only minor deficiencies.
Good	80 – 71	Effective performance; exceeds minimum contract requirements; reportable deficiencies, but with little identifiable effect on overall performance.
Satisfactory	70 – 61	Effective performance; exceeds minimum contract requirements; reportable deficiencies with identifiable, but not substantial effects on overall performance.
Poor/ Unsatisfactory	60 - 0	Overall performance does not meet minimum contract requirements; remedial action required in one or more areas; numerous deficiencies which adversely affect performance.