SUBJECT **PREPARATION OF THE SPARE PARTS ANALYSIS (SPA)**

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PURPOSE

The purpose of Base Operations and Spaceport Services (BOSS) BOSS developed Spare Parts Analysis (SPAs) is to ensure the availability of spare parts for planned and unplanned maintenance or planned repair. Spare parts analyses are performed to optimize the inventory to minimize cost and mission impacts and meet operational and availability requirements for BOSS managed assets.

SCOPE AND APPLICABILITY

This procedure applies to Logistics personnel assigned to develop and maintain SPAs for the BOSS and also assigns responsibility to various BOSS Divisions involved in the creation, revision, review, approval, publication and cancellation of documents that are part of the SPA process. Direct support extends to the following divisions: Logistics, Facility/Systems/Equipment/Utilities (FSEU) Operations, and Engineering.

PROCESS

The SPA development process meets contractual requirements as stated in Performance Work Statement (PWS) Attachment J-1 section below.

- 4.1.1.2.7: "Develop or modify Spare Parts Analyses (SPAs) in accordance with LOG-P-5004, *Preparation of the Spare Parts Analysis (SPA)*, for newly assigned or modified FSEU as a result of baseline work."

The process involves coordination between various organizations including but not limited to the Configuration Management office (CM), Construction Services (CS), FSEU Operations, Logistics Engineering (LE), and Logistics Support Analysts (LSA).

The general SPA development process is outlined in Figure 1, "SPA PROCESS FLOW CHART".

1. REQUIREMENTS

The SPA development meets the BOSS Contract requirements defined in PWS, Attachment J-1, section 4.2.1.1.4 and 4.2.1.1.4. as stated below:

- Section 4.2.1..a: "Incorporate all existing Engineering Orders on configured drawings/documents into new drawing/document revisions within two years of original Engineering Order release date. All exceptions shall be approved through the CCB."

A requirement for a SPA to be created or revised is reflected in an open Operations and Maintenance Document (OMD) report initiated by the CMO for projects, field changes, or Configuration Control Board Directives (CCBD) approved by the Facilities/Systems/Equipment/Utilities Configuration Control Board (FSEU CCB) and/or by Operations, Maintenance, Engineering, and User Configuration Control Board (OMEU CCB). Figure 2, "SPA ACTION DECISION MATRIX", defines which SPAs will be considered for generation or update, based on system type and Operationally Essential (OE) status.

2. DEVELOPING A SPA FOR NEW BOSS PROJECTS

The BOSS CMO coordinates agenda items for new BOSS projects. The BOSS Configuration Management (CM) Baseline Manager (BLM) coordinates an BOSS Project Summary and Documentation Planning Form, ENG-F-DE10 and presents it at the FSEU CCB and/or the OMEU CCB along with NASA, Board Members, and invited guests that represent their respective organizations and area of expertise.

2.1. Design Engineering (DE)

- DE is responsible for technical authority on SPAs and responds to Engineering Information Requests (IRs) ENG-F-DE15 requesting signature approval on the Document Release Authorization (DRA) KSC Form 21-68.
- DE routes completed drawings for configured systems to the CMO for release into EDC ensuring Logistics is on DRA distribution.

2.2. FSEU

The System Engineer (SE) coordinates with LSA/LE to develop the spare parts list required to support the new FSEU. Below are the responsibilities of the SE to support the SPA process.

- SE calls out essential spares and special requirements for spares, such as, cleaning, packaging, storage, calibration, etc. as identified by the vendor and specifications on the SPA documentation or via email to LE or LSA.
- SE determines what parts and how many to spare or procure via just-in-time based on restore to service requirements, long lead time, known part reliability and system redundancy.
- SE populates appropriate Next Higher Assembly (NHA) values during SPA development.
- SEs are responsible for technical accuracy and provide signature approval on KSC Form KSC50-351 OM, SPAs and the DRA pertaining to their assigned FSEU upon their final review

2.3. Construction Services

Construction Services (CS) coordinates with LE to transition the project parts list submittals into a spare parts list required to support the new FSEU.

2.4. SPA Development

Logistics Engineer (LE) receives a preliminary ENG-F-DE10 form from the CMO for documentation review prior to FSEU and OMEU CCBs. LE confirms the system and the baseline in the OMEU and responds to the CMO for open spa requirements, if known.

When a new spa requirement is identified in the open OMD report due to project approval by the CCB, ENG-F-DE10, LSA develops a SPA in accordance with TDC-P-0001, Control of Engineering Documentation.

- LE generates Maximo tasks and labor information under the associated Work Order Number (WON).
- LSA requests a SPA number from EDC and generates a DRA from Configuration Management Data Systems (CMDS), OMEU, and the BLM list to validate the Operations and Maintenance Document Baseline, Equipment Location, Title, Baseline Number, Station Set (SS), Program Model Number (PMN), Work Unit Code (WUC), reference the WON, and identify required signatures and distribution list.
- A file folder is created for new work and the SPA number is added to the SPA Tracking Database.
- LSA completes KSC Form KSC50-351 OM, Analysis Cover Form.
- LSA annotates special instructions for spares handling, storage, cleaning, calibration, and shelf life requirements on the KSC Form KSC50-351 OM, Analysis Cover Form.
- LSA screens the part numbers in Maximo from the compiled parts list, and for numbers currently in the item inventory and identifies any like/common items for possible substitution.
- LSA gives any like/common items to the SE and DE for approval.
- LE/LSA obtains manufacturer pricing data and availability information if no item number exists.
- LSA assigns appropriate Commercial and Government Entity (CAGE) data (manufacturer or source of supply) and the Source, Maintenance, and Recoverability (SMR) Code (Appendix A).
- LSA ensures all parts data is added to the Spares Engineering Sheet, LOG-F-5004. Data may include manufacturer part number, next higher assembly part number, pricing, part name and description, NASA part number if any, and quantity per assembly.
- LSA uploads completed SPA package into engineering database ProjectWise and notifies LE, DE, SE, and NASA Engineer to review and sign the SPA package DRA and Analysis Cover Sheet in the appropriate signature places.
- The signed DRA serves as the signature approval. LSA signs, compiles and forwards signed SPA packages electronically to CM for EDC to release.
- Procurement of Safety stock will not occur until the LE generates an Electronic Work Request (EWR) on the signature approved SPA by DE,

SE, and NASA Engineering. EWR is generated to obtain contract funding to procure safety stock.

- LSA assigns item numbers into the Maximo. LSA will set Safety Stock, Reorder Point (ROP)/Economic Order Quantity (EOQ) levels to replenish once signature concurrence is received from DE, SE, and NASA Engineering on SPA package.
- LSA codes and assigns location and reservation in Maximo during SPA creation.
- LSA establishes stocked and non-stocked records, and assigns commodities.

2.5. Spares Identification Group (SIG)

- LE convenes SIG with representatives from SE, DE, and CS to review the associated engineering documentation and begins compiling a spares list. The spares list includes (at a minimum) manufacturer name, model number, minimum quantity to spare, Operationally Essential designation (if applicable), spares handling, storage, cleaning, calibration, shelf life requirements, and NHA (if desired).
- DE provides latest configured system drawings for spares list development.
- SE provides system maintenance and operation requirements, including a provisional list of recommended spare parts.
- CS provides the complete project parts list submittals, including recommended spare parts.
- LE forwards spares information from the SIG to LSA.

3. SPA PROCESS FOR MODIFICATIONS TO EXISTING FSEU

Proposed changes to a configured system are screened, evaluated, and are approved by the FSEU and/or the OMEU CCB. The CMO maintains the Project and Configuration Management System (PCMS) utilized to generate an open Operations and Maintenance Documentation (OMD) Report which serves as notification to organizations of approved modifications to existing FSEU.

If an anomaly occurs in the field requiring immediate corrective action that affects form, fit, or function of a configured system, a Field Change Checklist, ENG-F-TD02 is completed. (Refer to ENG-P-0002). The CM BLM reports the Field Change to the CCB ENG-F-DE10 for concurrence. If the Field Change is approved, configuration documentation is updated as necessary.

Any change to a configured document that is not tied to a WON or other type of project may be submitted as an IR or is given a Configuration Control Board Directive (CCBD) number. The entire suite of documents is listed on an ENG-F-DE10 form and provided to the CCB under the CCBD number similar to the processing of Field Changes.

An Engineering Order (EO), KSC Form 50-191 (OM), is used to make a change to an existing SPA. Changes are approved by the SE, DE, and NASA Engineering with signature concurrence on the EO. The signed DRA serves as the signature approval and authority to release into EDC via the CMO.

A SPA revision is a complete system analysis which results in the generation of a new set of SPA documents. It requires a review of documentation and coordination between effected organizations. SE, DE, and NASA Engineering provide signature concurrence. The signed DRA serves as the signature approval and authority to release into EDC via the CMO.

3.1. Design Engineering

- DE is responsible for technical authority and approval signatures on SPAs, Engineering Support Requests (ESRs) KSC Form 21-319, EOs, Information Requests (IRs) and DRAs to assigned FSEU.
- DE routes completed drawing changes to the CMO for release into EDC ensuring LSA is on DRA distribution.

3.2. Operations and Maintenance

The Systems Maintenance Engineer (SE) serves as the technical expert for changes/additions/deletions to documents for operation and maintenance of assigned FSEU. The SE can request changes to an existing SPA based on SPA reviews, modification to existing systems via Field Change or CCBD, IRs, ESRs, Work Orders, or changes affecting real time support requirements. SEs review preliminary change documents, such as EOs and SPA revisions, for technical accuracy and provide signature concurrence on final documents.

- SE validates essential spares, special requirements and specifications for spares such as cleaning, packaging, storage, calibration, etc. to ensure LSA locate these requirements on the SPA or EO.
- SE determines new or changed requirements for spare parts using the Spares Schedule Impact Matrix as a guide.
- SE populates appropriate Next Higher Assembly (NHA) values during SPA development, if NHA values are not already assigned.
- SE has technical signature approval authority on the Analysis Cover Form, KSC Form KSC350-351 OM, ESRs, EOs to SPAs and DRAs authorizing the release of the document into EDC.

3.3. Construction Services

Construction Services (CS) coordinates with Logistics Engineering (LE) to transition the project parts list submittals into spare parts list required to support the new FSEU.

3.4. Logistics Support Analyst/Logistics Engineering

Logistics Engineering (LE) receives preliminary ENG-F-DE10 from the CMO for documentation review prior to FSEU and OMEU CCBs. LE confirms the system and the Baseline in the OMEU to identify current SPA revision and EO status. LE responds to the CMO of open SPA requirements, if known.

The requirement to review an existing SPA is identified in the open OMD report for all configured systems being impacted due to an approved project, Field Change or CCBD by the CMO. LSA generates ESR, KSC Form 21-319 to initiate SPA changes and go through a CM BLM via an electronic IR, ENG-F-DE15. When the IR is resolved, signed off by DE, and CCB approved (if required), the IR is returned to LSA to enable LSA to generate an EO or SPA revision, if required.

- LSA obtains a copy of the SPA and the active EOs from KSC Engineering Documentation System (KEDS), and coordinates the drawing/document(s) variations with DE and the SE. (An EO references the WON, Field Change, ESR, IR or CCBD number relevant to the change).
- LSA requests an EO number from Engineering Documentation Center (EDC) and generates a DRA from CMDS, OMEU, and the BLM List to validate the OMD Baseline, Equipment Location, Title, B/L Nos., Station Set (SS), Program Model Number (PMN), Work Unit Code (WUC), required signatures, and an appropriate distribution list.
- LSA creates a file folder for the SPA revision/EO, and adds the SPA revision/EO to the SPA Tracking Database.
- For revisions: LSA completes KSC Form KSC350-351 OM, Analysis Cover Form, as page one of the SPA revision package to identify the current SPA revision.
- For EOs: LSA completes KSC Form 50-191 (OM), to document the SPA change.
- LSA screens any new Maximo part numbers for matching item numbers currently in the system and identify any like/common items for possible substitution to the SE for approval. LSA obtains manufacturer pricing data and availability information if no item number exists.
- LSA assigns manufacturer CAGE and SMR Codes for new part numbers to the change document (EO or SPA revision).
- LSA summarizes all spares identified as Operationally Essential (OE) per SE on the Analysis Cover Form as part of the SPA package. LSA notes the OE spares on LOG-F-5004 in the remarks section of the SPA revision or in the remarks section of the EO, whichever applies.
- LSA adds all parts data to the Spares Engineering Sheet, LOG-F-5004 (for revisions) or to KSC Form 50-191 (OM) for EOs by way of the LSA

Tracking database. Data may include manufacturer part number, next higher assembly, pricing, part name and description, NASA part number, if any, and quantity per assembly. Upon completion, LSA electronically routes the document(s) to CC.

- LSA establishes stocked and non-stocked records and assigns commodities.
- LSA updates the inventory records in Maximo. Adjustments are made to the inventory to add, delete or update spares requirements.

3.5. Spares Identification Group (SIG)

- LE convenes Spares Identification Group with representatives from SE, DE, and CS to review the associated engineering documentation and begins compiling a spares list. The spares list includes (at a minimum) manufacturer name, model number, minimum quantity to spare, Operationally Essential designation (if applicable), spares handling, storage, cleaning, calibration, shelf life requirements, and NHA (if desired).
- DE provides latest configured system drawings for spares list development.
- SE provides system maintenance and operation requirements, including a provisional list of recommended spare parts.
- CS provides the complete project parts list submittals, including recommended spare parts.
- LE forwards spares information from the SIG to LSA.

4. CANCELLING/OBSOLETING SPAS

Periodically, due to changes in NASA requirements, configured/OE FSEU may be removed or a system may no longer be operated or maintained by BOSS. Also, FSEU may be downgraded from configured status. In such cases maintained documents require action to coincide with changing OMEU reporting.

4.1. Logistics Support Analyst/Logistics Engineering

- The FSEU or OMEU CCB provides notification for downgrading FSEU from essential and/or configured status. The CCB provides notification for removing FSEU from BOSS responsibility on ENG-F-DE10.
- If a SPA is impacted, LSA obtains a copy of the SPA and the active EOs from KEDS to perform an initial assessment of inventoried items. If more than one system is associated with the SPA, LSA initiates the process to remove the cancelled/deleted or downgraded FSEU.

- If the SPA is deemed obsolete, stocked spares are reviewed and coordinated with the SE for dissemination to other FSEU. If the spares are not utilized, they may become candidates for excess.
- LSA updates the SPA to the next revision and generates a Document Release Authorization (DRA) from Configuration Management Data Systems (CMDS), Operations, Maintenance, Engineering, and User (OMEU), and the Baseline Manager (BLM) list to validate the existing Operations and Maintenance Document Baseline, Equipment Location, Title, Baseline Number, SS, PMN, WUC, required signatures and a distribution list.
- LSA completes KSC Form KSC350-351 OM, Analysis Cover Form, to document the reason to cancel or obsolete the SPA.
- SE, DE, and NASA Engineering provide signature concurrence. The signed DRA serves as the signature approval and authority to release into EDC via the CMO.

  LSA updates the inventory records in Maximo. Adjustments are made to the inventory to delete/modify spares requirements. LSA completes a SF 1428 form to excess material as required.

5. DETERMINATION OF QUANTITY TO SPARE

The following factors are the minimum to be considered to determine the level on quantity of spares required to be available in the inventory.

- Lead-time: This value reflects the time delay in obtaining a part from supplier. The longer the lead-time for a part, the greater the need to locally spare the part.
- Cost: This value reflects the cost for procuring a part. The higher the cost, the greater the need to not spare the part as part of sound business practices.
- Consumption Rate: This value reflects the rate at which the part is consumed, usually expressed parts per unit of time (usually one (1) year). The higher the consumption rate, the greater the number of spares necessary. When no adequate consumption data exists, the following data can be used in substitution:
  - Number of Assets: This value reflects the quantity currently in use. The value is based on the number of assets using the part. The higher the number of assets using a given part, the greater the number of spares necessary. Example: a part would need to be stocked at higher levels if used in 400 units than if used in 40 units.
  - Failure Rate: This value reflects the rate at which the part is expected to fail, usually expressed in hours or years. The higher the failure rate, the greater the number of spares necessary. Example: a part would need to be stocked at higher levels if it failed on average every six months than if it failed on average every twenty years.

- Criticality: This value reflects the expected mission impact of procurement delays. A sufficient quantity should be spared to facilitate immediate repairs for operationally essential FSEU. For non-OE FSEU, sparing should be *minimized* where no Commercial Off the Shelf (COTS) parts exist, and should be *avoided* where COTS parts exist.

FIGURE 1: SPA PROCESS FLOW CHART

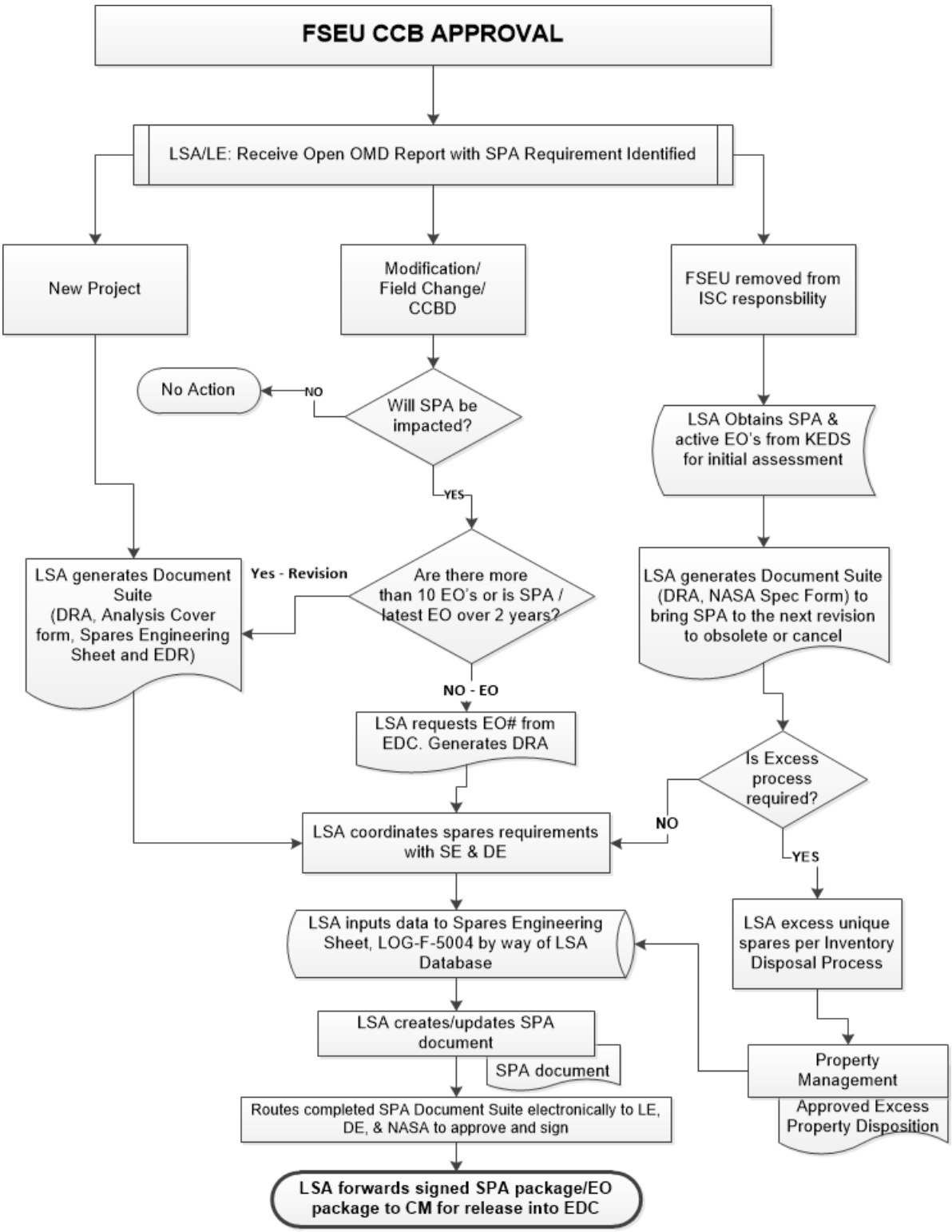


FIGURE 2: SPA ACTION DECISION MATRIX

Configured System	OE Systems - SPA Required	Non-OE Systems - SPA Required
Bridges	NA	Yes
Cathodic Protection	No	No
Compressed Air	Yes	No
Controls (KCCS, PPF BAS, IOZ BAS)	Yes	No
Electrical Low Voltage	Yes – excluding branch panels and below	No
Electrical Medium Voltage	Yes	NA
Electronic Security	Yes	Yes
Elevators	Yes	No
Fire Alarm	Yes	No
Fixed Generators	Yes	No
Grounding/Lightning Protection	No	No
Heating, Ventilation, Air Conditioning	Yes – includes chiller plants	No
IOP/Sound Suppression	Yes	NA
MRAP Vehicles	Yes	NA
ODMS	Yes	No
Preaction, Deluge and Chemical Suppression	Yes	No
Traffic and TAWS	NA	No
UPS, Facility	Yes	No
Water	No	No
Wet Pipe Suppression	No	No
Heavy Equipment, Cranes, Forklifts, Hoists & Powered Doors	To be determined case-by-case	To be determined case-by-case

APPENDIX A: SOURCE, MAINTENANCE, RECOVERABILTY CODE TABLE:

APPENDIX A: SOURCE, MAINTENANCE, RECOVERABILITY CODE TABLE

SOURCE				MAINTENANCE				RECOVERABILITY		STOCKAGE CRITERIA	
				USE		REPAIR					
1st POSITION		2nd POSITION		3rd POSITION		4th POSITION		5th POSITION		6th POSITION	
P	PROCURABLE	A	STOCKED	O	REPLACE BY TECHNICIAN IN THE FIELD	Z	NO REPAIR	Z	NON-REPARABLE CONDEMN BY TECHNICIAN IN THE FIELD	C	OPERATIONALLY ESSENTIAL SPARE - MUST REMAIN IN STOCK AT ALL TIMES. WILL BE HELD IN A SPECIAL LOCATION
		B	INSURANCE								
		G	GSE			B	NO REPAIR - RECONDITION ONLY (CALIBRATION, PROOF LOAD TEST, ETC.) BY LABS					
K	COMPONENT OF A REPAIR KIT NON-STOCKED	F	MANUFACTURE KIT					O	REPARABLE CONDEMN BY TECHNICIAN IN THE FIELD		
		D	VENDOR KIT								
		B	IN BOTH KITS	F	REPLACE AT LABS	O	RESPONSIBILITY FOR REPAIR BY TECHNICIAN IN THE FIELD			G	JUST IN TIME - PROCURED AS NEEDED
M	MANUFACTURE NON-STOCKED	O	ORGANIZATIONAL					F	REPARABLE CONDEMN BY LABS		
		F	INTERMEDIATE			F	RESPONSIBILITY FOR REPAIR BY LABS				
		D	DEPOT								
A	ASSEMBLE NON-STOCKED	O	ORGANIZATIONAL					D	REPARABLE CONDEMN BY THIRD PARTY REPAIR FACILITY		
		F	INTERMEDIATE	D	REPLACE BY MANUFACTURE	D	REPAIR BY THIRD PARTY REPAIR FACILITY			M	ESSENTIAL SPARE - MUST REMAIN IN STOCK AT ALL TIMES
		D	DEPOT								
X	NON-STOCKED	A	SEE NEXT HIGHER ASSEMBLY			L	REPAIR OEM ONLY	L	REPARABLE CONDEMN AT OEM LEVEL BY VENDOR		
		B	RECLAMATION			C	CLEAN, REPLACE SOFT GOODS, AND TEST ONLY BY LABS				
		C	DRAWINGS, OBSOLETE, ETC.								

RECORDS

The following records are retained by the organizations listed below:

Record	Responsible Organization
ENG-F-DE10 Project Summary Form	Engineering Services
LOG-F-5004 Spares Engineering Sheet	Engineering Services
ENG-F-TD02 Field Change Checklist	Engineering Services
KSC Form 50-191 (OM) Engineering Order	Engineering Services
KSC Form 50-191A (OM) Engineering Order Continuation Sheet	Engineering Services
ENG-F-DE15 Engineering Information Request Form (IR)	Engineering Services

AFFECTED DIVISIONS/OFFICES

Engineering Services
FSEU OM&E
Information Technology
Logistics
Program Management Office
Quality, Safety, and Environmental Services
Work Control Center

MANAGEMENT ROLES AND RESPONSIBILITIES

BOSS Program Manager: Ensures BOSS compliance to the requirements stated in this procedure. Reviews and approves or disapproves waiver requests written against this standard.

Division Manager: Ensures compliance within the Division to the requirements stated in this procedure.

Department Manager: Ensures compliance at the department level to the requirements stated in this procedure.

Baseline Manager (BLM): A Baseline Manager is assigned critical and configured baselines for FSEU as defined in CMDS OMEU. Baseline Managers maintain the Baseline Manager Contact List and provide Logistics agenda items to be presented before the Configuration Control Boards identifying SPA requirements, if any.

Configuration Management Office (CMO): The CMO provides final administrative review of the DRA portion of the SPA package prior to submitting to the Engineering Documentation Center (EDC) for release into the KSC Engineering Documentation System (KEDS).

Construction Services: BOSS Construction Services processes project submittals associated with Construction of Facilities (CofF) and BOSS projects. Project submittals typically include parts lists and recommended spare parts lists. CS brings those submittals to the SPA Development Group meeting to expedite spares list generation.

Design Engineering (DE): BOSS Design Engineering is responsible for the development, sustainment and revision of FSEU drawings. DE responds to Engineering Information Request (IR) forms (ENG-F-DE15) affirming a final document review and technical signature authority on the Document Release Form (DRA) for SPAs and Engineering Orders (EOs) that depict an approved change to a SPA.

Facilities, Systems, Equipment and Utilities Configuration Control Board (FSEU CCB) and Operations, Maintenance, Engineering, and User CCB (OMEU CCB): The CCB establishes, assesses and authorizes proposed changes to the configuration baseline of BOSS FSEU. CCB decisions determine CMO action to notify organizations of open OMD requirements. For example, the need for a new or revised SPA.

Logistics Engineer (LE): Logistics Engineering participates as a quorum member of the Facilities, System, Equipment & Utilities Configuration Control Board (FSEU CCB) and Operations, Maintenance, Engineering, and User CCB (OMEU CCB) by providing input/analysis regarding potential SPA impacts. LE attends Design Reviews and coordinates Engineering Support Requests (ESR), KSC Form 21-319, with affected organizations. LE convenes the Spares Identification Group meeting.

Logistics Support Analyst (LSA): LSA develops a SPA on a Spares Engineering Sheet, LOG-F-5004, using the SPA Identification Group spares list, verify parts availability, assign Source, Maintenance, and Recoverability (SMR) codes, finalizes the SPA package for approval and release to EDC via the CMO. LSA is responsible for assigning item numbers and maintaining the Next Higher Assembly table for the SPA.

System Engineer (SE): System Engineer is the person assigned responsibility for maintenance and documentation of FSEU. The SE provides technical and maintainability input as the design develops for new or existing FSEU and provides signature authority for technical accuracy to SPAs. The SE is the primary point of contact for LSAs performing SPAs.

REFERENCE DOCUMENTS

The following documents are referenced in this procedure:

Document Number	Title
ENG-F-DE10	Project Summary and Documentation (PSD) Planning Form
ENG-F-DE15	Engineering Information Request Form (IR)
ENG-F-TD02	Field Change Checklist

Document Number	Title
ENG-P-0002	Configuration Management of Facilities/System/Equipment/Utilities (FSEU)
KDP-KSC-P-1537	Document Release Authorization (DRA) Process
KSC Form 21-319	Engineering Support Request (ESR)
KSC Form KSC350-351_OM	Analysis Cover Form
KSC Form 21-68	Document Release Authorization (DRA)
KSC Form 50-191 (OM)	Engineering Order (OM)
KSC Form 50-191A (OM)	Engineering Order Continuation Sheet (OM)
KSC Form 7-657V2	Export Determination Request (EDR)
LOG-F-5001	Spares Schedule Impact Matrix
LOG-F-5004	Spares Engineering Sheet
NF-1686	Sensitive But Unclassified (SBU)
SF 1428	Inventory Schedule B
TDC-P-0001	Control of Engineering Documentation

ACRONYMS

BLM Baseline Manager
BOSS Base Operations and Spaceport
CCBD Configuration Control Board Directive
CM Configuration Management
CMDS Configuration Management Data Systems
CMO Configuration Management Office
CofF Construction of Facilities
COTS Commercial Off-the-Shelf
CS Construction Services
DE Design Engineering
DRA Document Release Authorization
EDC Engineering Documentation Center
EDR Export Determination Request
EO Engineering Order
ESR Engineering Support Request
FSEU Facility/Systems/Equipment/Utilities
FSEU CCB Facility/Systems/Equipment/Utilities Configuration Control Board
IR Engineering Information Request
JIT Just in Time
KEDS Kennedy Engineering Documentation System
LE Logistics Engineering
LRU Line Replaceable Unit
LSA Logistics Support Analyst
NASA National Aeronautical and Space Administration
NHA Next Higher Assembly
O&M Operations and Maintenance
OE Operationally Essential
OM&E Operations, Maintenance & Engineering

OMD	Operations and Maintenance Document
OMEU	Operations, Maintenance, Engineering, and User
OMEU	CCB Operations, Maintenance, Engineering, and User Configuration Control Board
PCMS	Project and Configuration Management System
PMN	Program Model Number
PSD	Project Summary and Documentation
PWS	Performance Work Statement
SE	Systems Engineering
SIG	Spares Identification Group
SMR	Source, Maintenance, and Recoverability
SPA	Spare Parts Analysis
SS	Station Set
WON	Work Order Number
WUC	Work Unit Code

DEFINITIONS

Document Release Authorization (DRA): KSC Form 21-68 is used to authorize and record the official release or revision/changes of drawings, specifications, SCA/SAAs, SPAs, and other engineering documentation such as studies, calculations, and reports into EDC per KDP-KSC-P-1537. The DRA serves as the signature approval document for SPAs and/or EOs signifying an authorized change to a SPA.

Document Suite: A document suite referred to as a SPA Package for new FSEU consists of the following:

- DRA with approval signatures
- Analysis Cover Sheet (KSC350-351 OM)
- KSC Form 7-657V2, Export Determination Request (EDR)

Spares Engineering Sheet(s), LOG-F-5004, detailing parts An Engineering Order (EO) package consists of signed DRA and EO, KSC Form 50-191 (OM). A document suite for a SPA Package for cancellation/deletion consists of signed DRA and KSC Form KSC50-351 OM to the next revision.

Engineering Documentation Center (EDC): Engineering Documentation Center, which provides a central repository for engineering documentation. It includes both hardcopy and electronic media.

Engineering Order (EO): An Engineering Order KSC Form 50-191 (OM) is used to document changes to released engineering drawings, specifications, SPAs, and other types of operations and maintenance documentation.

Engineering Support Request (ESR): Engineering Support Request (KSC Form 21-319) is used to initiate an engineering investigation for part number/vendor/manufacturer change/discrepancy or obsolescence resolution of inventoried items of supply for critical, OE or configured FSEU.

Field Change: A real-time change affecting form, fit, and/or function of a configured system -- specifically, an anomaly that needs to be corrected immediately in the field. All field changes require Form ENG-F-TD02 and must receive CCB approval.

Just in Time (JIT): Just in time is a philosophy that describes an approach with the objective of producing the right part in the right place at the right time which is readily available, usually with more than one vendor; therefore, a part does not need to be spared in inventory.

KSC Engineering Documentation System (KEDS): The KSC Electronic Documentation System is part of the BOSS Document Center and provides on-line access to released engineering documentation that is not limited access.

Line Replaceable Unit (LRU): An item (assembly or subassembly) that can be removed and replaced as a unit from the system at the operating location.

Maintenance Summary Sheet: KSC Form KSC350-351 OM, Analysis Cover Form, serves as a cover sheet to an SPA and summarizes the maintenance concept, special instructions, reference documents, and critical/OE items if any.

Next Higher Assembly (NHA): A datapoint used to designate where a given spare is a sub-assembly to another spare. Where an assembly-to-subassembly relationship is desired by the SE, the NHA field of the subassembly is populated with the part number of the assembly. Where no NHA relationship is desired, “N/A” is entered into the field.

Operationally Essential (OE): FSEU is designated Operationally Essential if overall system function is required for mission and/or improper performance of system function could result in a loss, deferment, or unrecoverable delay of a mission.

Operations, Maintenance, Engineering, and User (OMEU): A matrix report listing FSEU at Kennedy Space Center (KSC) and Cape Canaveral Air Force Station (CCAFS). OMEU responsibilities are listed for each FSEU line item, by facility. The OMEU is accessible from the BOSS home page.

Operations and Maintenance Documentation (OMD): The documentation forming the configuration baseline documentation. OMD may include drawings, instructions, specifications, SPAs, Operational Maintenance Requirements and Specifications Documents (OMRSDs), Operations and Maintenance Instructions (OMIs), Preventive Maintenance Instructions (PMIs) and other configuration control documents.

Source, Maintenance, and Recoverability (SMR) Code: SMR codes are a series of alpha or alphanumeric symbols used at the time of provisioning to indicate the source of supply of an item, its maintenance implications, and recoverability characteristics.

Spare Part Analysis (SPA): The process of analyzing documentation to identify spares, spare quantities, stocking/non-stocking requirements, special handling or storage conditions, costs, sourcing, and repairable status for configured FSEU and establishing a logistics support structure in the BOSS Inventory Management System, Maximo.

REVISION RECORD

The following revisions have been applied to this document:

Revision Number	Change Description	Date
1	Legacy Document	07-18-08
2	Initial ISC Release to define requirements for developing and maintaining a Spare Parts Analysis (SPA).	08-14-09
3	Assigned responsibility for Next Higher Assembly (NHA) data population. Renumbered, formatted, and added acronyms to meet ISC standardized template	05-05-10
4	Revised SPA development process flow. Revised to clarify requirements for non-configured Mission Essential systems; removed reference to LOG-F-5001 Spares Schedule Impact Matrix.	08/23/10
5	Revised to reflect removal of Critical spares contract requirements, change in SSRE organizational responsibilities,	06/24/14
6	Revised to reflect SPA development impacts as a result of implementation of Firm Fixed Price Contract	02/01/17
7	Revised to remove KSC Form 21-617 NS and replace with KSC Form KSC50-351_OM.	08/29/17
8	Updted to BOSS format	03/23/20
9	Revised to include Logistics Engineer	04/20/20

DOCUMENT APPROVALS

4/14/2020

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4/14/2020

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