



LAUNCH AND RECOVERY SYSTEMS OPERATING PROCEDURE

TITLE: LAUNCH PROCESSING SYSTEM SUPPORT
REQUEST

No.: USA002183
Rev.: 7
Date: 05/13/2009
Page: 1 of 21

POLICYMAKER: INTEGRATED DATA SYSTEMS

1. PURPOSE AND SCOPE

- a. This Operating Procedure (OP) establishes the responsibilities and requirements for preparation and processing of Launch Processing System Support Requests (LPSSRs) and the resultant, system-generated Maximo Work Orders (WOs) to request changes to systems managed by Integrated Data System (IDS). *Changes authorized for modification per this OP are maintenance in nature (e.g., the replacement of equipment, installation of patches, or scripting of operator actions), and do not alter architecture, functional requirements, or design of the system.* The LPS subsystems affected by this OP are under Configuration Management (CM) by the IDS Configuration Control Board (CCB) or Ground Systems (GS) CCB.
- b. The LPSSR Maximo WO is prohibited from authorizing/implementing the following:
 1. Custom code development or modifications, except for scripting to augment out-of-the-box capabilities of Commercial-Off-The-Shelf (COTS) Software (S/W).
 2. Kennedy Space Center (KSC) Network (KNET) connectivity or disconnect provisions.
 3. Labor and non-labor changes exceeding the limits listed in Section 3.
 4. Adverse changes to the overall Information Technology (IT) Security Control Architecture (SCA).
 5. *Work authorized under the scope of an IDS CCB approved Engineering Support Request (ESR). An ESR is the required mechanism for authorizing work if the system under modification is undergoing change to architecture, functional capability, capacity, or design.*

2. APPLICABILITY

This OP is applicable to *Launch and Recovery Systems (L&RS) personnel supporting ground operations* and Information Management IT Security.

3. REQUIREMENTS

Note: *The United Space Alliance (USA) parent document for this OP is Functional Policy and Procedure (FPP)-D-03-08.*

- a. A parent Maximo WO with work type LPSSR is opened for changes that are identified on the LPSSR Approved Task List defined in Appendix A as authorized in OP USA004623.
- b. LPSSRs are to be implemented by approved Maximo WOs.
- c. Maximo WOs that implement LPSSRs are to comply with OPs USA001649 and USA004727.

A copy of this OP may not be current. Verify currency by querying SELS. The signed change request is maintained by Administrative Procedures.

- d. Non-labor costs for LPSSR-initiated changes are not to exceed \$2,500.00.
- e. Labor hours for LPSSR-initiated changes are not to exceed 250 hours.
- f. Requests for new and/or modified user computer access requests are to be submitted on a Computer User Registration Form (CURF), *located under Computers and Systems on the USA Internal Web page.*
- g. Computer connections to the LPS Operational Network (LON) in the Launch Control Center (LCC) firing rooms require Control Room Enhancement Review Team (CERT) approval prior to LON Administrator approval of an LPSSR.
- h. The LPSSR Maximo WO is processed according to Directorate Operating Procedure (DOP) IDS-CMWC-040. *Reference Appendix D for general LPSSR process flow.*
- i. *An approved LPSSR allows for updates to documentation, drawings, and artifacts released to the Technical Document Center (TDC). Reference OP USA004605 for instructions to prepare and release engineering documentation and revisions.*

4. RESPONSIBILITIES

Not applicable

5. PROCEDURE

5.1 LPSSR ORIGINATOR

- a. Complete all blocks on the form. To ensure correct and timely processing, the information entered on the LPSSR is to be thorough, concise, and accurate.
- b. Access the LPSSR at the following web site as follows:

<http://maximo/>

1. Enter the **Maximo ID** and **Maximo Password** and click on the Continue button.
2. After signing into Maximo, select "LPS Support Request" on the left side of web page under "Work Requests" and the LPSSR form will be displayed.

(Reference Appendix E for complete instructions for completing the LPSSR.)

5.2 SYSTEM AND NETWORK ADMINISTRATORS (OR DESIGNEE)

- a. Review LPSSR Maximo WO within 3 workdays of creation *and determine if LPSSR is approved or disapproved.*
- b. Assess LPSSR Maximo WO for justification, security impacts, implementation plan, urgency, and scope of work required to fully implement the request.
- c. Evaluate the urgency of the request and coordinate need dates with the originator.
- d. Coordinate with the requester to clarify requirements, as required.
- e. Coordinate the implementation of approved LPSSR Maximo WO with responsible system or subsystem work groups.

- f. Provide notification to the originator that the request was approved or disapproved (with rationale) and the estimated completion date if approved.
- g. If LPSSR Maximo WO is disapproved as out of scope as defined by this OP, request that users reference OP USA004610.
- h. Ensure closure of all tasks in support of the LPSSR.

5.3 LPS ENGINEERING'S SYSTEM ENGINEERING AND INTEGRATION

- a. Review the LPSSR Maximo WO within 3 workdays of submission to determine any impacts to materials and/or non-labor costs, *L&RS Design Engineering (DE)* support requirements, and released drawings and/or documentation maintained by LPS Engineering's Hardware Engineering. (Reference Appendix F.)
- b. Provide Systems and/or Network Administration with an Engineering Assessment detailing the level of work required, estimated non-labor cost, and estimated man-hour impact via e-mail notification.

5.4 IT SECURITY FLORIDA OPERATIONS

- a. Review each LON LPSSR Maximo WO and provide a security evaluation consistent with FPP D-03-08.
- b. Provide a written or electronic (preferred) security impact assessment to the requesting organization and NASA Budgets and Contracts Branch (*NE-B1*) when a security impact is identified or when requested by LPS Operations, *LPS* Maintenance, *NASA* Engineering *Directorate (NE)*, or NASA Launch Vehicle Processing Directorate (PH).
- c. Provide work steps and/or job plans in Maximo for processing.
- d. For Maximo WOs assigned to IT Security, process through closure.

5.5 LPS SOFTWARE DEVELOPMENT

Review proposed COTS S/W releases and provide technical evaluation to LPS Systems Administration, if required.

5.6 NASA CONTROL AND DATA SYSTEMS DIVISION (NE-C)

Review and approve all LPS Operations Maximo WOs and test/validation plans.

5.7 NASA MECHANICAL DIVISION (NE-M)

Review and approve Maximo WOs for KSC Complex Control System (KCCS) change requests.

5.8 VALIDATION PROCESSING

Validate Platform and Application changes according to DOP IDS-VAL-047 and/or DOP IDS-UVAL-086.

5.9 LPS ENGINEERING'S RELEASE PROCESSING

Release Platform and Application changes according to DOP IDS-RPCM-031.

5.10 QUALITY SYSTEMS' SUPPORT QUALITY INSPECTION

Provide and/or perform Maximo WO inspections according to OP USA001649.

5.11 CERT-APPROVED USERS

Comply with CERT directions for computers being connected to the LON in the LCC control rooms for LPSSR WOs.

6. DEFINITIONS

Note: Also, reference OP USA004783, Appendix B for LPSSR Approved Task Descriptions, and Appendix C for LPS System Descriptions.

Access Control List (ACL). A router or switch configuration parameter used to manage access to LON sub-networks and manage access to subsystem resources.

Commercial-Off-The-Shelf (COTS). Non-custom H/W and S/W products that are procured from commercial sources.

Configuration Files. Files used to define the functional parameters of workstations, servers, routers, switches, and other LON devices.

Control Room Enhancement Review Team (CERT). The team chartered by NASA NE-O to establish and provide guidance and direction for and screening of proposed developmental computer-based systems that justifiably can be located in an LPS and/or Checkout, Control, and Monitor Subsystem (CCMS) command-and-control environment.

End User Devices (EUD). Internet Protocol (IP) device used by end users that require LON connectivity but are not considered part of the LON infrastructure.

Engineering Support Request (ESR). The form used to request changes to configuration-controlled LPS H/W or S/W, which exceed the limits placed on the use of an LPSSR.

Enterprise Management System (EMS). Hardware (H/W) and S/W used by Central Operations Facility (COF) personnel to monitor and manage LPS subsystems.

Enterprise Management System (EMS) Scripts and Templates. S/W component developed/modified by IDS personnel to augment the out-of-the-box capabilities of COTS S/W. For the purpose of this document, templates are a set of rules that contain message conditions and attributes. Rules can be defined for log files, console messages, monitored objects, and Simple Network Management Protocol (SNMP) traps.

Firmware (F/W). S/W or Read-Only Memory (ROM)/Programmable Read-Only Memory (PROM) that is installed in network devices, workstations, and servers.

Hewlett Packard (HP) OpenView. A suite of COTS EMS S/W components procured from HP. Primary examples are HP OpenView Operations (OVO) and Network Node Manager (NNM).

Integrated Data System (IDS) Configuration Control Board (CCB). Chartered board consisting of NASA and Space Program Operations Contract (SPOC) personnel who have the responsibility to review and approve or disapprove ESR requests for configuration changes to the LPS managed systems.

Job Plan. A Maximo form where standardized work steps are documented.

Launch Processing System Support Request (LPSSR). A web-based support request form (maintained by IDS) used to request LPS changes described in this OP.

LPS Operational Network (LON) IP Database. Database administered by LPS Maintenance LON field engineers used to track LON IP addresses and their assignment.

LPS Operational Network (LON) Matrix. A document (administered by System Engineering and Integration and maintained in Documentum) used to track information associated with the connection of end user devices to the LON. Also documents the OS, F/W, and configuration file revision levels of LON routers, switches, hubs, and other LON devices.

LPS Operational Network (LON) Soft Configuration. Configuration files or manually entered parameters that define the operational characteristics of a LON infrastructure device.

Network. A collection of H/W devices (infrastructure) and soft configured switches, routers, and firewalls. The network infrastructure provides a means for connected systems to be isolated into compartmentalized segments that provide logical isolation from each other. The physical configuration of the network infrastructure and the soft configuration of the individual devices define the actual communications capabilities of any attached system or node.

Released Engineering Documentation. All releases of engineering documentation and revisions require a Space Program Operations Contract (SPOC) Document Release Authorization (DRA). Engineering documentation includes such items as:

- a. Engineering drawings
- b. Formal sketches
- c. Engineering Orders (EOs)
- d. Interface Control Documents (ICDs)
- e. Interface Revision Notice (IRNs)
- f. Modification Packages (MPs) (items include Engineering Instructions (EIs) and Time Compliance Technical Instructions (TCTIs))
- g. Project Definition Packages (PDPs) or Work Packages (WPs)
- h. Engineering standards
- i. Operations and Maintenance Requirements and Specifications Document (OMRSD)
- j. Manuals, handbooks, and design review documentation
- k. Systems Assurance Analysis (SAA), Hazard Analysis (HA), and spare analyses
- l. General publications, technical reports, schematics, and field diagrams
- m. System Documentation List (SDL)
- n. Vendor drops, shop drawings, and other similar documents

Security Patch/Update. Patches or updates to OSs, applications, F/W, or S/W configurations (including LON devices) that correct or minimize security-related vulnerabilities that could cause loss of support if exploited.

7. REFERENCES

DOP IDS-CMWC-040 IDS Change Management Work Control Process for Maximo

DOP IDS-RPCM-031, Launch Processing System (LPS) [Release Processing](#)

DOP IDS-UVAL-086, LPS User Validation Plan

DOP IDS-VAL-047, LPS Verification and Validation Test Plan

FPP D-03-08, IT Security Evaluation Process

OP USA001649, Maximo Work Control System

[OP USA004605, SPOC Document and Release Authorization \(DRA\) Preparation](#)

OP USA004610, Engineering Support Request (ESR)

OP USA004623, Integrated Data Systems Configuration Control Board Operations

OP USA004727, LPS Post-Configuration Freeze Modification Implementation

OP USA004783, Definitions [for Terms in Operating Procedures \(OPs\)](#)

8. FORMS

Not applicable

APPENDIX A
LPSSR APPROVED TASK LIST
Part 1

Shuttle Data Center (SDC) and Central Operations Facility (COF) System									
TASK*	SYSTEM**								
	SDC	LPSS	LSDN	BASIS	PCGOAL	COF	LIMS	ADD	RSI SSVR
PLATFORMS									
COTS Operating System (OS) S/W patches and S/W upgrades	1	1	1	1	1	1	1		1
COTS OS S/W configuration changes	1	1	1	1	1	1	1		1
APPLICATIONS									
COTS application/agent S/W patches and S/W upgrades	X	X	X	1	1	X	X		X
COTS application/agent S/W configuration changes	X	X	X	1	1	X	X		X
Open source application S/W patches and minor S/W upgrades		X	X	1					
Open source application S/W configuration changes		X	X	1					
SYSTEM ADMINISTRATION									
EMS scripts and templates	X	X	X	X	X	X	X		X
Reinstall/restore COTS baseline OS/application/agent S/W on workstations/servers	X	X	X	X	X	X	X	X	X
Workstation/server installations, removals, and relocations	1	1	X	1,2	1,2	1	1		1
Antivirus & virus definition file updates	X	X	X	X	X	X	X		X
Network Services (IP Address, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP))	X	X	X	X	X	X	X		X
Server-to-server data relocation	X	X	X	X	X	X	X		X
Creation/modification of scheduled events	X	X	X			X	X		X
User account attributes	X	X	X	X	X	X	X		X
Install/remove peripheral H/W	X	X	X	X	X	X	X		X
Printers configuration setup	X	X	X	X	X	X	X		X
Routine system maintenance procedures	X	X	X	X	X	X	X	X	X
System and user file maintenance (save/restore)	X	X	X	X	X	X	X	X	X
Network and system diagnostic, maintenance, test, and support S/W/script tools	X	X	X	X	X	X	X		X
<i>Update artifacts and/or documentation, when applicable.</i>	X	X	X	X	X	X	X		X

Legend:

Acronyms: 1) LPS Support System (LPSS), 2) LPS Software Development Network (LSDN), 3) Business and Support Information Services (BASIS), 4) LPS Isolated Management System (LIMS), 5) Advisory Data Distributor (ADD), 6) Real-time Simulation Interface (RSI) and Simulation Servers (SSVR).

(1) Requires Post Configuration Freeze Mod Implementation Authorization (PCFMIA) during the change implementation freeze period. (Reference OP USA004727.)

(2) *BASIS and PCG2 workstation installations, relocations, or removals in CCMS Firing Rooms and HMF require Console Chief (CC) approval.*

(X) Exempt from PCFMIA with NASA NE-C2 concurrence.

Grey boxes are not applicable.

***Reference Appendix B for task descriptions.**

****Reference Appendix C for system descriptions.**

APPENDIX A
LPSSR APPROVED TASK LIST
Part 2

Record and Playback Subsystem (RPS)						
TASK*	SYSTEM**					
	Servers and Workstations	Digital Recorder Group Workstations	MTU	Recorder and Library System	Dewetron System	RPSLOAD Workstation
PLATFORMS						
COTS OS S/W patches and S/W upgrades	1	1	1	1	1	1
COTS OS S/W configuration changes	1	1	1	1	1	1
APPLICATIONS						
COTS application/agent S/W patches and S/W upgrades	X	X	X	X	1	X
COTS application/agent S/W configuration changes	X	X	X	X	1	X
SYSTEM ADMINISTRATION						
EMS scripts and templates	X	X	X			X
Reinstall/Restore COTS Baseline OS/Application/Agent S/W on workstations/servers	X	X	X	X	X	X
Workstation/server installations, removals and relocations	1	1	1	1	1	1
Antivirus and virus definition file updates	X	X	X	X		X
Network Services (IP Address, DNS, DHCP)	X	X	X	X	X	X
Server-to-server data relocation	X	X				
Creation/modification of scheduled events						
User account attributes	X	X	X	X	X	X
Install/remove peripheral H/W	X	X				
Printers configuration setup	X	X	X	X	X	X
Routine system maintenance procedures	X	X	X	X	X	X
System and user file maintenance (save/ restore)	X	X	X	X	X	X
Network and system diagnostic, maintenance, test, and support S/W/script tools	X	X	X	X	X	X
<i>Update artifacts and/or documentation, when applicable.</i>	X	X	X	X	X	X
Legend:						
(1) Requires PCFMIA during change implementation freeze period. Reference OP USA004727.				Grey boxes are not applicable		
(X) Exempt from PCFMIA with NASA NE-C2 concurrence.				*Reference Appendix B for task descriptions.		
				**Reference Appendix C for system descriptions.		

APPENDIX A
LPSSR APPROVED TASK LIST
Part 3

CCMS						
TASK*	SYSTEM**					
	CUI Workstations and Servers	Console Switch	Console Printers	Launch Data Bus Monitor (LDBM) Workstation	Bio-Med	Embedded Telemetry Format Converter (ETFC) Workstation
PLATFORMS						
COTS OS S/W patches and S/W upgrades				1		1
COTS OS S/W configuration changes				1		1
APPLICATIONS						
SYSTEM ADMINISTRATION						
Reinstall/restore COTS baseline OS/application/agent S/W on workstations/servers						
Workstation/server installations, removals and relocations						
Antivirus and virus definition file updates						
Network services (IP Address, DNS, DHCP)						
Server-to-server data relocation						
Creation/modification of scheduled events						
User account attributes	X	X		X	X	X
Install/remove peripheral H/W						
Printers configuration setup						
Routine system maintenance procedures						
System and user file maintenance (save/restore)						
Network and system diagnostic, maintenance, test, and support S/W/script tools						
Legend:						
(1) Requires PCFMIA during change implementation freeze period. Reference OP USA004727.				Grey boxes are not applicable.		
(X) Exempt from PCFMIA with NASA NE-C2 concurrence.				*Reference Appendix B for task descriptions. **Reference Appendix C for system descriptions.		

**APPENDIX A
LPSSR APPROVED TASK LIST**

Part 4

Ground Systems Support			
TASK*	SYSTEM**		
	Critical Data Acquisition System (CDAS)	Ground Measurements System II (GMSII)	KCCS
PLATFORMS			
COTS OS S/W patches and S/W upgrades			1
COTS OS S/W configuration changes			1
APPLICATIONS			
COTS application/agent S/W patches and S/W upgrades	X	X	X
COTS application/agent S/W configuration changes	X	X	X
SYSTEM ADMINISTRATION			
EMS scripts and templates	X	X	X
Reinstall/restore COTS Baseline OS/application/agent S/W on workstations/servers	X	X	X
Workstation/server installations, removals, and relocations	1	1	1
Antivirus and virus definition file updates	X	X	X
Network services (IP Address, DNS, DHCP)	X	X	X
Server-to-server data relocation			X
Creation/modification of scheduled events			X
User account attributes			X
Install/remove peripheral H/W			X
Printers configuration setup			X
Routine system maintenance procedures			X
System and user file maintenance (save/restore)	X	X	X
Network and system diagnostic, maintenance, test, and support S/W/script tools			X
<i>Update artifacts and/or documentation, when applicable.</i>			
Legend:			
(1) Requires PCFMIA during change implementation freeze period. Reference USA004727.		Grey boxes are not applicable.	
(X) Exempt from PCFMIA with NASA NE-M8 and NE-C2 concurrence.		*Reference Appendix B for task descriptions. **Reference Appendix C for system descriptions.	

APPENDIX A
LPSSR APPROVED TASK LIST
Part 5

LON	
TASK*	SYSTEM**
NETWORKS	LON
Network OS patches and minor upgrades	1
Network F/W upgrades	1
Network connections, removals & relocations	X
Network Shuttle Data Stream (SDS) filters	X
Network switch/router S/W configuration changes	X
Network documentation updates	X
SYSTEM ADMINISTRATION	
User account attributes	X
Routine system maintenance procedures	X
Network and system diagnostic, maintenance, test, and support S/W/script tools	X
Legend:	
(1) Requires PCFMIA during change implementation freeze period. Reference USA004727.	Grey boxes are not applicable.
(X) Exempt from PCFMIA with NASA NE-C2 concurrence.	*Reference Appendix B for task descriptions.
	**Reference Appendix C for system descriptions.

APPENDIX B LPSSR APPROVED TASK DESCRIPTIONS

PLATFORMS
<p>COTS OS S/W patches and S/W upgrades: Vendor provided individual patch or patch bundles and vendor provided S/W releases that will implement S/W fixes and/or enhancements to the COTS OS.</p>
<p>COTS OS S/W configuration changes: Configuration changes to the COTS OS kernel parameters, file systems, system/network services, configuration files, and scripts that will implement S/W fixes and/or enhancements.</p>
APPLICATIONS
<p>COTS application/agent S/W patches and S/W upgrades: Vendor provided individual patch or patch bundles and vendor provided S/W releases that will implement S/W fixes and enhancements to the application S/W release.</p>
<p>COTS application/agent S/W configuration changes: Configuration changes to the COTS application and agent S/W configuration files, scripts, and features that will implement S/W fixes and enhancements.</p>
<p>Open source application S/W patches and S/W upgrades: This item consists of open source individual patches and patch bundles and open source application and agent S/W releases to include S/W fixes and enhancements to the application S/W release.</p>
<p>Open source application S/W configuration changes: This item consists of modifications to open source application and Agent S/W configurations to include taking advantage of S/W fixes and enhancements (e.g., enabling new feature sets).</p>
NETWORKS
<p>Network OS patches and upgrades: Vendor provided individual patch or patch bundles and vendor provided S/W releases to include S/W fixes and enhancements to the network OS release.</p>
<p>Network F/W upgrades: Vendor provided F/W updates for network infrastructure devices required to ensure proper operation of the H/W.</p>
<p>Network connections, removals & relocations: Network connectivity changes for supporting EUD network connections, disconnections, or relocations.</p>
<p>Network SDS filters: Switch based filtering of the SDS required to support Space Shuttle test support operations in the LCC control rooms.</p>
<p>Network switch/router S/W configuration changes: Switch/router configuration or ACL changes.</p>
<p>Network documentation updates: Provides for the updating of the LON IP database and/or the LON matrix.</p>
SYSTEM ADMINISTRATION
<p>EMS scripts and templates: Develop new or modifying existing EMS scripts to add, delete, or change monitoring capabilities of a workstation or server.</p>
<p>Reinstall/restore COTS baseline OS/application/agent S/W on workstations/servers: Provides for the restoration of system baseline O/S, application, and agent S/W to workstations and servers.</p>
<p>Workstation/server installations, removals & relocations: Provides for the installation, removal, and/or relocation of workstations and servers and updates to released drawings and documentation.</p>

SYSTEM ADMINISTRATION (continued)
<p>Antivirus and virus definition file updates: Provides for definition file updates to systems running antivirus S/W.</p>
<p>Network services (IP Address, DNS, DHCP): This item consists of adding, changing, and/or deleting IP addresses on network interfaces; name/IP address entries in the IDS DNS database and configuration data in the IDS DHCP databases.</p>
<p>Server-to-server data relocation: Allows for movement of data between systems or between sets.</p>
<p>Creation/modification of scheduled events: This item consists of the adding, changing, and/or deleting of automatically executed commands and scripts used for system administration, monitoring, and maintenance (e.g., cron for UNIX systems).</p>
<p>User account attributes: Provides for user account creations, deletions, and modifications to support approved CURF request and file access requirements. Provides for password file maintenance to include password updates and/or changes.</p>
<p>Install/remove peripheral H/W: Provides for the installation or removal of peripheral devices.</p>
<p>Printers configuration setup: Provides for changes to printer configuration changes to support printer replacement, additions, and/or deletions.</p>
<p>Routine system maintenance procedures: Provides for routine systems administrative tasks for performing data management, operations maintenance system reboots, system log file maintenance, system file/database maintenance, and user/system informational files.</p>
<p>System and user file maintenance (save/restore): Provides for system and user data/file management for performing the deletion and restoration of data/files, system saves, and restores.</p>
<p>Network and system diagnostic, maintenance, test, and support S/W/script tools: This item consists of deploying and configuring tools necessary to monitor the health of and diagnose problems of the network and systems on the network supplemental to the existing EMS system such as What's Up Gold to monitor network traffic use, RMON and observer probes, and scripts to graph in a user-friendly format data already collected by the EMS, PCG2 OP notes, release notes, user guides, and similar files, etc.</p>
<p><i>Update artifacts and/or documentation when applicable. This item provides for the updating of artifacts, drawings, and documentation released to TDC.</i></p>

APPENDIX C LPS SYSTEM DESCRIPTIONS

- a. **Advisory Data Distributor (ADD) Gateway.** A Versa Module Europa (VME)-based system that processes Fuel Cell Monitoring System (FCMS) and Metrological System (Metro) data. This data is subsequently merged with the Shuttle Data Stream (SDS) Prime. The SDS data can be viewed with PCGOAL. Operator initialization and parameter changes are accomplished via a web-based Maintenance User Interface (MUI).
- b. **Business and Support Information Services (BASIS).** A PC workstation group configured to allow users across multiple contractors access to PC business systems while in operational areas. The workstation group is a Microsoft XP Platform Image with a server farm in the LCC.
- c. **Central Operations Facility (COF) Enterprise Management System (EMS).** Monitors the health and performance of servers and contributing resources (OSs, applications, internal networks) of the IDS directorate: SDC, RPS, Real-Time Simulation Interface (RSI), LPS Software Development Network, LPS Operational Network, and Ground Measurement Support directorate, Kennedy Control System and Ground Measurement Systems.
- d. **Critical Data Acquisition System (CDAS).** A critical high-speed data acquisition system located on the MLPs, Pads, and the LCC that collects Hold Down Post (HDP) strain data and GOX vent arm actuator bolt strain data (launch only) during SRB, External Tank (ET), and Orbiter stacking operations and launch.
- e. **Embedded Telemetry Format Converter (ETFC) Workstation.** Converts hazardous gas workstation ethernet packet data into Pulse Code Modulation (PCM) downlink data that is processed by the CDL1 FEP and Common Data Buffer (CDBFR) to be viewed at a CCMS console or from PCGOAL. The ETFC consists of a VME based computer system. Operator control of the ETFC chassis is via a PC based ETFC Workstation. Operator initialization and parameter changes are accomplished by the use of a web-based Maintenance User Interface (MUI).
- f. **Ground Measurement System (GMS) II.** A non-critical high-speed data acquisition system located on the MLPs, Pads, and the LCC that collects launch phenomena such as stress, vibration, heat, and pressure, which affects all areas of the launch pad Fix Service Structure (FSS) as well as the MLP during launch.
- g. **Kennedy Space Center Complex Control System (KCCS).** The computer system that is used to checkout, monitor, and control utilities at KSC. KCCS is entirely COTS based and is hosted on servers running Windows NT and uses two separate and isolated Ethernet networks to provide communications. One is for power systems and the other for utility systems. Citect is the application used to provide supervisory control and data acquisition.
- h. **Launch Data Bus Monitor (LDBM) Workstations.** A recording system located in the firing rooms that captures all the traffic on the Launch Data Buses (LDBs). The

APPENDIX C (continued)

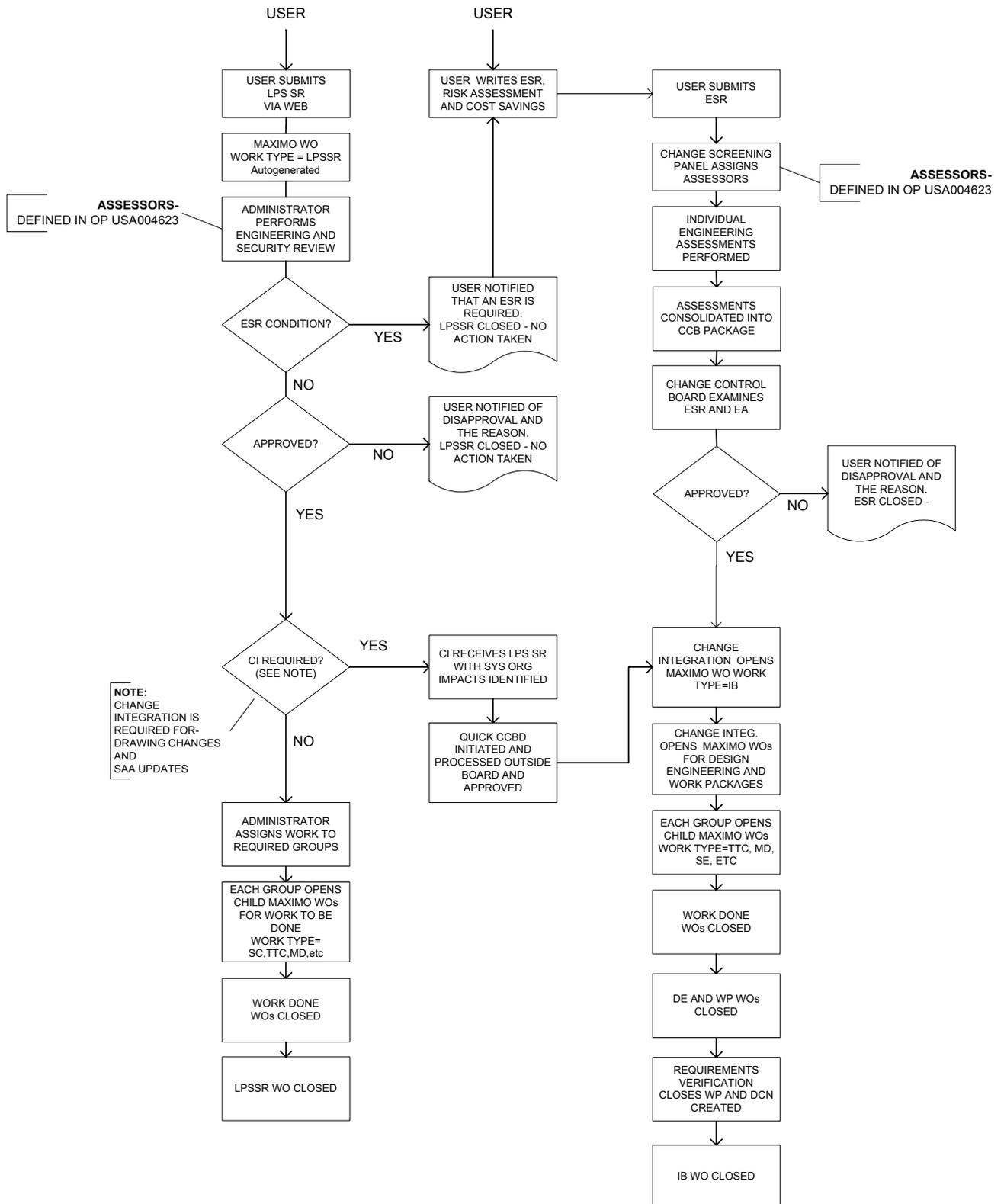
data is recorded to local disk and archived to Compact Disk (CD) and Digital Video Disk (DVD) periodically. The LDBM consists of a Sun workstation and VME chassis with a Motorola PowerPC, connected via an Ethernet interface.

- i. **Launch Processing System (LPS) Operational Network (LON).** Routers, switches, hubs, fiber, cables, and other devices that provide network communication or an exclusive service supporting launch operations that are documented in the LPS Engineering drawing set and under configuration control of the IDS CCB. The LON consists of a portion connected via firewalls to KNET and a physically isolated portion, LPS Isolated Operational Network (LION) that is not connected to any external network.
- j. **LPS Isolated Management System (LIMS).** Server and workstation used by COF personnel to monitor and manage systems connected to the LPS Isolated Operational Network portion of the LON. These systems include KCCS, GMSII, and CDAS.
- k. **LPS Software Development Network (LSDN).** Serves as a S/W development environment for PCGOAL programs that are used to interface with the Space Shuttle vehicle and Ground Support Equipment (GSE). LSDN produces mission-specific PCGOAL programs that are used in the CCMS.
- l. **LPS Support System (LPSS).** Includes LPS servers and workstations, used by LPS Operations, Maintenance, and Engineering in support of day-to-day operations. Examples include: Smartcard Gateway, Patchlink, Doors, Sourcesafe, Track Studio, LPS Web/Lonprint, COF support workstations (i.e., netmgrsvr, cofgui2, ntwk1, rpscons, cofds1, cofnet, cofnet2, stratus1, rps-ws1/2), RSI workstations, SDC plotter workstations, and CCMS Environmental Monitoring System.
- m. **Personal Computer Government Aerospace Language (PCGOAL).** Advisory system that provides Shuttle Engineers and other interested parties with real time data display and plotting and aids in the decision-making process during shuttle testing, launching, and landing operations. PCGOAL consists of servers and workstations located in the LCC, PCC, HMF, and DFRC.
- n. **Real-time Simulation Interface (RSI) and Simulation Server (SSVR).** The RSI subsystem is comprised of both SUN servers and VME-based simulation chassis that run Solaris on Sparc-based FORCE boards and VxWorks simulator code on Western Avionics Simulator Processing Units (SPUs). RSI provides the LPS community with the capability to simulate actual H/W using computer models in order to train LPS console operators for Space Shuttle ground testing and launch operations; creates failure scenarios to investigate potential reactions or responses; and performs checkouts of the CCMS H/W/S/W to avoid potentially dangerous program deficiencies.
- o. **Record and Playback Subsystem (RPS).** Consists of Sun servers and workstations, MTU workstations, digital recorder group workstations, recorder and

library systems, Dewetron systems, RPSLOAD workstations, and maintenance laptops.

- p. **Shuttle Data Center (SDC).** Servers that store and make available retrieval Space Shuttle data that includes the following system components: Front-End Data Servers (FREDS), indexers, data stores, Operations/Configuration Management (OPSCM), retrievers, application, database, CCMS Application Build (CAB), user access servers, freeway(s), tape libraries, and Storage Area Network (SAN) switches, controllers, disks, and appliances.

APPENDIX D LPS SR/MAXIMO PROCESS



APPENDIX E**LPSSR**

- a. This appendix contains detailed instructions for completing the online LPSSR.
- b. The originator is responsible for the completion of all blocks on this form. To ensure correct and timely processing and preclude nonproductive effort, the information entered is to be thorough, concise, and accurate. N/A (for not applicable) is to be entered if the information requested is not applicable to the proposed change.

BLOCK	ENTRY TITLE	ENTRY DESCRIPTION
1	Requester	Input the Userid from login account information.
2	Work Phone	User's telephone number is predetermined from login account.
3	Reported Date	Today's date will be inserted automatically.
4	Title	Input a concise title for the request.
5	Technical Contact	Input the technical contact name as follows: <ol style="list-style-type: none"> a. Click on the magnifying glass icon to the right of the Technical Contact field b. In the Select Labor Code web page, type all or part of the last name of the Technical Contact in the Search For field and then click on the Find icon. c. In the Search Results portion of the Select Labor Code web page, click on the underlined name in the Labor Code column or click on the Cancel button to return to the Work Request web page.
6	Need Date	Input the user's need date as follows: <ol style="list-style-type: none"> a. Click on the Calendar icon to the right of the Need Date field. b. If the month for the need date is visible on the Select Date web page, click on the day of the month or click Next 3 Months (or Previous 3 Months) until the correct month is visible then click on the correct day of the month; otherwise, click on the Cancel button to return to the Work Request web page.
7	Action Requested	Input a request that is thorough, concise, and detailed.

Note: Please be as specific as possible by detailing the requirements, conditions, enhancements, changes, impact(s) if not implemented, etc.

BLOCK	ENTRY TITLE	ENTRY DESCRIPTION
8	Justification	Input justification for request. Note: Be as specific as possible in justifying why this request is needed.
9	Priority	Select the request priority as High, Medium, or Low.
10	Duration	Select a Short, Long, or Permanent term.
11	Project	Input the project number or ID, if associated with a project.
12	CERT Number	Input the CERT number or ID, if associated with a CERT request.
13	Location	Input the physical location of the change request, if known.
14	Summary	Review the summary information and make changes in Blocks 7 through 13, as required.
15	LPS Subsystem	Select the LPS Subsystem(s) affected by this request.
16	E-mail Copy to Requester	Select to e-mail (optional).
17	E-mail Copy to Technical Contact	Select to e-mail (optional).
18	Submit	Select Submit after inputting all information.
19	Reset	Select Reset to begin this request from beginning.
20	Cancel	Select Cancel to cancel this request.

APPENDIX F
TECHNICAL SUPPORT BASIS OF ESTIMATE

- a. Revised drawings require 6 hours per sheet
- b. New drawings require 10 hours per sheet
- c. A-size documents require 1 hour per 4 pages of text
- d. Material and/or non-labor costs
- e. *LPS Engineering* requirements

CHANGE HISTORY

REV	EFFECTIVE DATE	DESCRIPTION
7	05/13/09	Biennial review with process changes. Adds: USA parent document information at Section 3; a requirement at 3.i; a system admin. task in Appendix A; and a task description in Appendix B. Updates organizations and NASA directorates, OP format, and references. Clarifies Purpose and Scope. Deletes Reference OP USA000367.
6	12/12/06	Reflects total rewrite of current operations.
5	07/07/05	Reflects current operations and reference documents.
4	12/03/04	Rewritten to reflect current LPSSR usage and reference documents. Incorporates and cancels OP USA004630.
3	03/15/04	Rewritten to reflect current operations and reference document.
2	05/01/03	Annual update. Reflects a 100% rewrite, including new updates for current processes to the COF systems and title change.
1	03/29/02	Annual update. Includes current reference document and terminology.
Basic	03/12/01	New procedure to request changes to the COF Enterprise Management systems or hardware.