[DRAFT-2]

JEFFERSON LAB PERSONNEL SAFETY SYSTEM

CONFIGURATION CONTROL POLICY

Approval Page
for
PSS Configuration Control Policy

July 26, 2000

Approved

_____

K. Mahoney Date
Group Leader
Safety Systems

Approved

_____

R. May Date
Group Leader
Radiological Control

Approved

_____

S. Prior Date
EH&S Officer
Accelerator Division

Approved

_____

A. Hutton Date
Deputy Assoc. Director
for Commissioning/Operations

Approved

_____

C. Rode Date
Deputy Assoc. Director
for Systems Support

Approved

_____

C. W. Leemann Date
Associate Director &
Accelerator Division Head

Approved

_____

L. Cardman Date
Associate Director &
Physics Division Head

TABLE OF CONTENTS

GENERAL **1**

CONFIGURATION CONTROL POLICY 1
PERSONNEL SAFETY SYSTEM CONFIGURATION COMMITTEE 1

1.0 CONFIGURATION BASELINE **2**

1.1 FUNCTIONAL DESCRIPTION 2
1.2 TECHNICAL DESCRIPTION 2

2.0 CHANGE CONTROL **5**

2.1 PROPOSALS 6
2.1.1 Change Request Process *6*
2.1.2 Jumper Request Process *6*
2.1.3 Review *7*
2.1.4 Approval *7*
2.2 FINAL DESIGN 8
2.2.1 Design Proposal *8*
2.2.2 Review *9*
2.2.3 Approval *10*

3.0 CONFIGURATION ACCOUNTING **11**

3.1 HARDWARE DOCUMENT CONTROL 11
3.2 SOFTWARE DOCUMENT CONTROL 12
3.2.1 PLC Ladder Logic *12*
3.2.2 Display and Applications Programs *12*
3.2.3 Firmware *12*
3.3 CERTIFICATION AND CHECKLIST DOCUMENT CONTROL 13
3.4 PLC LOGIC SPECIFICATIONS 13

4.0 HARDWARE AND SOFTWARE REPAIRS **14**

4.1 HARDWARE 14
4.2 SOFTWARE 15

APPENDICES

APPENDIX A. CLASSIFICATION OF TYPICAL PSS SYSTEMS AND DEVICES FOR CONFIGURATION CONTROL. **17**

APPENDIX B. DEFINITIONS **19**

APPENDIX C. CONFIGURATION CHANGE REQUEST FORM **21**

APPENDIX D. WORK AUTHORIZATION FORM **22**

APPENDIX E. JUMPER REQUEST FORM **23**

GENERAL

CONFIGURATION CONTROL POLICY

In accordance with the Jefferson Lab contractual commitments found in the Accelerator Facility Operations Requirements (Appendix E - Attachment, MOD#119), and the EH&S Manual (Appendix 6310-T2, Beam Containment Policy), a system of controls and procedures shall be established to administer changes to the Personnel Safety System. The objective of this policy is to ensure that the reliability of the PSS is not compromised due to unauthorized or inadvertant modification to the hardware, the software, or the certification process.

PERSONNEL SAFETY SYSTEM CONFIGURATION COMMITTEE

Purpose

The Personnel Safety System Configuration Committee (PSSCC) is, with respect to safety concerns, the primary reviewing and approving authority for changes to the configuration of the PSS.

Membership

The permanent membership of this committee consists of the Accelerator Division EH&S Officer; the Radiation Control Group Leader; the Safety Systems Group Leader, an Accelerator Operations Group Leader, and an Accelerator Engineering Group Leader. Each member shall designate a substitute, in case of absence, in order to maintain a balanced group and ensure prompt response to proposals. In addition, the committee may call on employees with needed technical expertise for information and advice. Decision making is by consensus. Committee leadership is by vote and is rotated annually. The committee reports directly to the Accelerator Division Associate Director.

Meetings

The committee is convened, as needed, by the Operations Department Head; however, any team member may also call for a full review. The committee leader will ensure that meeting minutes are recorded and published.

Configuration Change Requests

The Committee reviews requests for changes to PSS configuration in accordance with an approval process that is described in Section 1.0. Primary concern is that changes meet established safety criteria and conform to Jefferson Lab policy and procedures.

1.0 CONFIGURATION BASELINE

The current configuration of the PSS is detailed in a body of documentation that includes manuals, specifications, drawings, and computer databases. These make up the baseline by which changes are referenced.

1.1 FUNCTIONAL DESCRIPTION

Refer to:

S-003-000	Description of Personnel Safety System, revised May 1998
	Jefferson Lab Beam Containment Policy, March 1994
	Jefferson Lab Final Safety Assessment Document, Rev.2, Sept.24, 1993
S-004-000	Personnel Safety System Design Review, Oct.9, 1990
S-005-000	Overview of the Accelerator Personnel Safety System, July 1991
S-006-000	End Station Radiation Safety Systems, Jan. 30, 1992
S-007-000	Segmented Personnel Safety System, Oct. 22, 1993
	FEL PSS Design Review

1.2 TECHNICAL DESCRIPTION

Note: Several of the documents listed will not be under configuration control and are included here for information only (*).

Hardware:

Refer to:

S-003-000	Description of Personnel Safety System, May 8, 1995
S-008-000	Access Control System Specifications, 1990
S-009-000	Intercom/PA Specifications, 1990, 1992, 1994, 1995
S-010-000	Message Display Specifications, 1991
S-011-000	Oxygen Monitoring System Specifications, 1993
	Manufacturer's Manuals *

Drawings:
S0001D01 to S0288D01
05301-D-0001 to 05346-D-0001

System Information:

S-012-000	PSS I/O Allocation - Injector
S-013-000	PSS I/O Allocation - North Linac
S-014-000	PSS I/O Allocation - South Linac

S-015-000	PSS I/O Allocation - Beam Switchyard
S-016-000	PSS I/O Allocation - Hall A
S-017-000	PSS I/O Allocation - Hall B
S-018-000	PSS I/O Allocation - Hall C
S-047-000	PSS I/O Allocation - FEL
	PSS Cable Number Lists *
	PSS Wire Lists *
	PSS Maintenance Database*

Software:

Refer to:

S-019-000	PLC Logic Specification - Injector
S-020-000	PLC Logic Specification - North Linac
S-021-000	PLC Logic Specification - South Linac
S-022-000	PLC Logic Specification - Beam Switchyard
S-023-000	PLC Logic Specification - Hall A
S-024-000	PLC Logic Specification - Hall B
S-025-000	PLC Logic Specification - Hall C
S-026-000	PSS Network Listings - SAFE-A
S-027-000	PSS Network Listings - SAFE-B
S-028-000	PSS User Handbook
See hardware	PSS I/O Allocation documents
S-029-000	PSS Display User's Manual *
S-030-000	PSS Display Programmer's Manual *
S-050-000	PLC Logic Specification - FEL
S-051-000	PSS Display Database*
S-052-000	PSS Display User Screens*
S-053-000	PSS / EPICS Interface Requirements

Certification:

Refer to:

S-002-000	Accelerator Certification Procedure

Tests:

S-031-000	Injector Certification Procedures
S-032-000	North Linac Certification Procedures
S-033-000	South Linac Certification Procedures
S-034-000	Beam Switchyard Certification Procedures
S-035-000	Hall A Certification Procedures
S-036-000	Hall B Certification Procedures
S-037-000	Hall C Certification Procedures
S-038-000	Functional Certification Procedures
S-048-000	FEL Certification Procedures

Checklists:

S-039-000	Injector Tests
S-040-000	North Linac Tests
S-041-000	South Linac Tests
S-042-000	BSY Tests
S-043-000	Hall A Tests
S-044-000	Hall B Tests
S-045-000	Hall C Tests
S-046-000	Functional Tests
S-049-000	FEL Tests

2.0 CHANGE CONTROL

PSS configuration will be controlled through a process of reviews and approvals. All proposals must be reviewed prior to any redesign. All designs must be reviewed and approved before implementation begins.

The PSS will have two types of change control for hardware, software, certification, and documentation. Changes that impact the functional or technical specifications will require a full configuration review process. Temporary modifications (i.e., jumpers) will follow a separate process of review and documentation. Both types of change control are described in the following sections.

Classification of equipment and software into specific levels is determined by an item's effect on the functional safety of the accelerator. These classifications result from fault analysis based on typical functionality and installation.

The levels are defined as follows:

Level 5 - *Systems and Devices that are vital to maintaining safety in downstream controlled areas that may be occupied.*

Level 4 - *Systems and Devices that are vital to maintaining safety in controlled areas that may be occupied.*

Level 3 - *Systems and Devices that are used in safe operation, but are not vital to safety in areas that may be occupied.*

Level 2 - *Systems and Devices that are convenient for routine operation, but are not required for safe operation.*

Level 1 - *Systems and Devices used for status or information only.*

- Change requests falling under multiple levels shall use procedures for the highest level affected.

- All cabling, wiring, and terminations shall fall into the same category as the associated device. (See Section 4.0 for exceptions.)

- For the purpose of this procedure, the final certification procedures and checklists shall be treated like hardware and software under strict configuration control.

2.1 PROPOSALS

2.1.1 Change Request Process

Changes to the PSS hardware or software configuration, or the certification procedures and checklists shall be initiated by submitting a request to the Safety Systems Group Leader.

1. PSS Configuration Change Request Form (CCRF) (see Appendix C).

   The requester shall provide the following information:

   - The reasons for the change.
     How will it affect safety?
     (For example, this could be a change in regulations, a change to accelerator operations, or just a beneficial upgrade.)

   - A description of new proposal.
     (Specify modifications, both functional and technical, as clearly as possible.)

   - A description of the impact to PSS schedules and budgets.
     (This may also require submitting a change request to the Change Request Review Board (CRRB)).

   - A description of the impact to other systems.

   - A description of documentation required.

   - A description of training requirements for operations, maintenance, and other personnel.

   - All supporting documentation shall accompany the request form.

2. A request form is numbered, logged, and issued by the PSS document custodian.

2.1.2 Jumper Request Process

Requests for temporary bypasses to specific equipment do not require a CCRF. Instead, submittal of a PSS Jumper Request Form (JRF) (see Appendix E) is needed.

- A jumper request for a PSS Critical Device (Level 5) requires a Temporary Operational Safety Procedure (TOSP).

2.1.3 Review

There are four possible reviews required for proposals to change the configuration of the Personnel Safety System. These are determined by the five PSS levels described in section 2.0 and Appendix A. The Safety Systems Group Leader shall initiate the review process by evaluating the impact to the PSS budget, resources, and current schedule. The request will then be forwarded to the required parties for further review as shown in **Table 1**.

- Review of Level 1 rests solely with the Safety System Group Leader, and approval may be verbal or in writing.

- Level 2 requires submittal of a PSS Configuration Change Request Form (CCRF), which the Safety Systems Group Leader will review.

- Level 3 requires the Safety Systems Group Leader to forward the request to the Operations Department Head for final review.

- Levels 4 and 5 require that the Operations Department Head forward the request to the PSS Configuration Committee. The approval process for these two levels is the same for this policy. The distinction between levels 4 and 5 is important for other PSS policies and procedures.

Table 1. Required Reviews

Level	SSGL	CCRF	OPS DH	PSSCC
1	X			
2	X	X		
3	X	X	X	
4	X	X	X	X
5	X	X	X	X

NOTE: SSGL Safety Systems Group Leader Review
CCRF Configuration Change Request Form Required
OPS DH Operations Department Head Review
PSSCC PSS Configuration Committee Review

2.1.4 Approval

Persons at each level of review and approval are ultimately responsible for determining if the approval process is complete at their level or if it must go on to the next higher level.

1. The approval required for each level shall be the same as for the review.

2. A proposal must be approved by the authorized parties prior to Safety Systems Group acceptance or commencement of the design/implementation process.

3. A notice shall be sent to the originator within 30 days explaining the status of the proposed Change Request. If approved, the request is forwarded to the Safety Systems Group Leader for design. If denied, the request shall be returned to the originator stating the reasons for the decision. The request may be resubmitted with changes.

4. A request that is resubmitted and contains corrections for all previous committee objections requires only the approval of the chairman of the PSSCC.

Proposals that conflict with current safety philosophy shall also be reviewed by the committee with oversight for the policy or directive in question, such as the Beam Containment Policy Committee. The committee will respond within 30 days of notification.

Approval from the appropriate Associate Director(s) will be required if a change is required by new statutes, DOE directive(s), or does not fall under any current policy.

2.2 FINAL DESIGN

2.2.1 Design Proposal

1. Once a proposal has been approved, the Safety Systems Group Leader will then develop a schedule, allocate time and resources, and assign personnel to the new design. The new schedule and resources must be approved by the CRRB if impact to the normal schedule is more than minimal. There may be situations where the design is developed outside of the Safety Systems Group or even outside of Jefferson Lab.

2. The design must meet or exceed the requirements stipulated in all Jefferson Lab safety policies or directives.

3. The design and implementation plan will be submitted for review.

4. The designer(s) shall provide the following information when necessary:

   - A description of changes to PSS systems and hardware that includes functional specifications, technical specifications, failure analysis, timing diagrams, and drawings.

   - A description of changes to software that includes functional specifications and programming lists.

   - Changes to the certification procedures that include tests and checklists.

- Changes to training for operations, maintenance, or other personnel that require new procedures.

2.2.2 Review

A review is required for all design changes to the configuration of the Personnel Safety System. The review process is determined by the five PSS levels described in section 2.0 and Appendix A. The Safety Systems Group Leader shall initiate this process once a design and implementation plan has been developed. This includes inviting all groups that may be affected by the changes. It is the SSGL's primary responsibility to oversee and present the new design. As his loyalty is to the Safety Systems Group, he will not participate as a reviewer for Levels 4 and 5 unless the design is developed outside of the group. The required parties for a complete review are shown in **Table 2.**

- Review of levels 1 and 2 is done by the Safety System Group Leader.
- Level 3 additionally requires the OPS Department Head for final review.
- Levels 4 and 5 require the OPS Department Head and the PSS Configuration Committee for final review.

Table 2. Required Reviews

Level	SSGL	OPS DH	PSSCC
1	X		
2	X		
3	X	X	
4		X	X
5		X	X

NOTE: SSGL — Safety Systems Group Leader Review
OPS DH — Operations Department Head Review
PSSCC — PSS Configuration Committee Review

A review by specific group leaders may be called to evaluate technical merit and impact on other systems.

An independent committee of experienced safety personnel from outside Jefferson Lab may be requested, depending on the nature of the design.

The reviewing parties' primary task is to assure changes to the PSS are safe. They are not empowered to propose new designs and implementations, but may provide insight and technical expertise in advising the Safety Systems Group staff.

2.2.3 Approval

1. The approval required for each level shall be the same as the review.

2. A design must be approved by the authorized parties prior to implementation by the Safety Systems Group.

3. A report shall be sent to the SSGL within 30 days explaining the status of the proposed design. If approved, the Safety Systems Group may start the implementation process. If denied, the design package shall be returned to the SSGL stating the reasons for the decision. The Safety Systems Group will then have to propose modifications to the design for review.

4. A design that is resubmitted and contains corrections for all previous committee objections requires only the approval of the chairman of the PSSCC.

Designs that conflict with current safety philosophy shall also be reviewed by the committee with oversight for the policy or directive in question, such as the Beam Containment Policy Committee. The committee will respond within 30 days of notification.

Approval from the appropriate Associate Director(s) will be required if a change is required by new statutes, DOE directive(s), or does not fall under any current policy.

3.0 CONFIGURATION ACCOUNTING

3.1 HARDWARE DOCUMENT CONTROL

A document may be originated or revised due to configuration changes or just improvements in style and description. A draft document must be reviewed and approved prior to acceptance as a "Master Document". All Master Documents will be archived by the PSS group. The only exceptions are the PSS Master Drawings which will continue to be filed in the Accelerator Document Control Room. A custodian will be assigned to oversee document control.

A cover sheet will accompany the document during the review process. The cover sheet will contain the document title, the document number (noting the new revision level), and the names of the required reviewers. When a document is reviewed and signed it will be forwarded in person to the next reviewer. Once the approval process is complete, the cover sheet will remain attached to the Master Document for reference.

A revision log will be maintained to track the status of all Master Documents. The custodian will complete the revision log entries, archive the master, and distribute copies as needed.

The controlled copy of all Master Documents will be maintained for public reference. The holders of uncontrolled copies will be issued revisions, but are responsible for updating their own documents. Uncontrolled copies shall be verified as current before use.

All PSS Master Documents will be assigned a document number. (The Master Drawings already have assigned numbers and are therefore not discussed here.) This number will consist of three groups separated by dashes. The document numbers will be prefaced by *JLAB*. The following explains the group identifications:

Group Number	Meaning	# of digits
1	Technical system	1
2	Sequential number	3
3	Revision number	3

For example a Certification Procedure could be: *JLAB-S-023-004*.

Once a draft document is approved it will be assigned a "000" as its initial revision level. Future changes will increment the revision number by one.

At some later date this number may be prefixed by a standard Jefferson Lab document numbering convention.

3.2 SOFTWARE DOCUMENT CONTROL

3.2.1 PLC Ladder Logic

PLC Master Program disks and listings are handled like documentation except as noted. Their labeling shall include a title, a document number, and a revision number. Each individual program will be on a separate disk(s). The listings for each program will be considered a part of that document.

In addition to standard documentation process, the following procedure is required once a PLC program modification has been approved.

- An authorized PLC programmer requests the Master Program disk (and listings) from the custodian.
- The custodian logs the withdrawal in the programmer's name, but does not increment the revision level.
- A programmer may only work on his/her own PLC logic. Associate Director approval is required to work on the parallel system software.
- The SSGL may substitute for either programmer if necessary, but shall work on only one PLC Ladder Logic (system A or System B) program per problem.
- The programmer makes a working copy of the disk and proceeds with the upgrade using the working copy.
- Once the working copy has been modified, it is uploaded to the segment PLC.
- This program is then certified through static and dynamic testing and signed off. (See PSS Certification Procedures)
- The final tested program is then downloaded to the Master Program disk, and the PLC programmer returns the disk to the custodian.
- The custodian will then relabel the disk with a new revision number and finish the logging process.

3.2.2 Display and Applications Programs

Display software and applications software require only regular document logging once changes are authorized by the SSGL.

3.2.3 Firmware

Changes to firmware are handled like documentation except as noted.

- Changes to PLC firmware shall require recertification of the PLC Logic and all systems and devices affected by the change.
- Changes to other PSS firmware shall require complete retesting of the host device and all systems it directly controls.
- Changes to PLD programs shall follow the same process as PLC Ladder Logic.

3.3 CERTIFICATION AND CHECKLIST DOCUMENT CONTROL

PLC certification procedures and checklists are handled like documentation except as noted.

- The checklists for each procedure will be considered a separate document.
- If a document is being modified for format or grammar, the revision is submitted to the custodian and logged.
- If the content of a document is modified, it shall be reviewed during a certification, corrected if necessary, and then submitted to the custodian. The custodian will provide a new revision number and finish the logging process.

3.4 PLC LOGIC SPECIFICATIONS

PLC logic specifications are handled like documentation except as noted.

- The specifications for each procedure will be considered a separate document.
- If a document is being modified for format or grammar, the revision is submitted to the custodian and logged.
- If the content of a document is modified, it shall be reviewed during a certification, corrected if necessary, and then submitted to the custodian. The custodian will provide a new revision number and finish the logging process.

4.0 HARDWARE AND SOFTWARE REPAIRS

4.1 HARDWARE

Repairs or replacement of PSS devices do not usually constitute a change of configuration. However if improperly done, wiring changes become configuration changes, and these may affect safety. These activities shall, therefore, be monitored to avoid inadvertent modifications. A list of typical PSS devices and their classification can be found in Appendix A. The PSS Work Authorization Form (Appendix D) is required for these repairs. Forms can be obtained from the PSS staff. In addition the following steps shall be performed.

Level 4 and 5 Devices:

- Authorization is obtained to perform the repair from the Operations Department Head and the Safety Systems Group Leader.

- A description, and if necessary a drawing, of the proposed repair shall be placed in the Safety System Log Book. It shall specify the type of repair, the physical location, and the affected signals.

- All devices and systems affected by the completed repairs shall be recertified by the method specified in the PSS Certification Procedures.

Level 3 Devices:

- Authorization is obtained to perform the repair from the Operations Maintenance Coordinator and the Safety Systems Group Leader.

- A description of the proposed repair shall be entered in the Safety System Log Book. It shall specify the type of repair, the physical location, and the affected signals.

- An observer is named to ensure the device is properly repaired and installed. This could be a PSS Engineer or the on-duty Crew Chief .

- All devices and systems affected by the completed repairs shall be recertified by the method specified in the PSS Certification Procedures.

Level 1 and 2 Devices:

- Authorization is obtained to perform the repair from the SSGL and/or a PSS Engineer. The on-duty Crew Chief shall be informed of the work to be done.

- A description, of the proposed repair shall be placed in the Safety System Log Book. It shall specify the type of repair, the physical location, and the affected signals.

- An observer is named to ensure the device is properly repaired, installed, and tested. This could be a PSS Engineer or a Crew Chief.

- All devices and systems affected by the completed repairs shall be recertified by the method specified in the PSS Certification Procedures.

4.2 SOFTWARE

Software "repairs", due to their nature, shall follow different procedures than hardware. These changes may also affect the configuration of the PSS, especially if done improperly.

Online changes to non-interlock PLC logic:

These include holding registers, timing/counting values, inputs/outputs from Levels 2 - 3, and element and network descriptors.

- Authorization is obtained to perform the repair from the Operations Department Head and the Safety Systems Group Leader.

- No changes shall be made to PLC Ladder Logic during beam operations.

- Only a PSS programmer may make any changes to the logic.

- A description of the proposed repair shall be placed in the Safety System Log Book. It shall specify the type of repair, the location in the program, and the affected logic.

- An observer is named to ensure the change is implemented properly. This requires a complete briefing about the full impact of the change and the details of how it will be accomplished. The observer shall be a member of the PSS Configuration Committee.

- The modified on-line database shall then be compared to the original off-line version to guarantee that only the desired changes were implemented.

- The functionality of the repair shall be fully tested prior to acceptance by the authorized observer and the on-duty Crew Chief.

Online changes to interlock PLC logic:

These include Level 4-5 inputs/outputs and PSS mode logic.

- Authorization is obtained to perform the repair from the Operations Department Head, the I & C Department Head, and the Safety Systems Group Leader.
- No changes shall be made to PLC Ladder Logic during beam operations.
- Only a PSS programmer may make any changes to the logic.
- The PLC logic for a segment and all affected systems shall be recertified by the method specified in the PSS Certification Procedures for any repairs to interlock logic.

Offline changes to logic:

All offline changes involve reloading the PLC program and therefore require a complete recertification.

Changes in EPICS/PSS software:

Changes to the application "SAFE_PLC", revisions of VxWorks, revisions of UNIX, and revisions of EPICS require a functional test of the application and the MEDM user-interface using the "simulation mode".

APPENDIX A. CLASSIFICATION OF TYPICAL PSS SYSTEMS AND DEVICES FOR CONFIGURATION CONTROL.

These classifications are the results of a fault analysis bases upon typical functionality and installation.

Level 5

Systems and devices that are vital to maintaining safety in downstream controlled areas that may be occupied.

FEL Laser Shutter interface
All Gun interfaces
Beam Stoppers
Beam Current Monitors (with exception of verification system)
Magnet Power Supply interfaces (that are designated critical devices)
East Arc Transfer Switches
PLC hardware and software that control Level 5 devices
Beam Kicker System

Level 4

Systems and devices that are vital to maintaining safety in controlled areas that may be occupied.

Radiation Monitor interlocks
Door and hatch switches
Exchange keys
RF interfaces
Magnet Power Supply interfaces (that are not designated critical devices)
Run/Safe Boxes
Interlocked Crash Switches
PLC hardware and software that control Level 4 devices

APPENDIX A. (CONT.)

Level 3

Systems and devices that are used in safe operation, but are not vital to safety in areas that may be occupied.

Magnetic locks
Emergency Exit Switches (non-interlocked)
Intercom / PA System
Tunnel lighting control
Message displays, warning beacons, klaxons
PLC hardware and software that control Level 3 devices
Beam Current Monitor (verification system)

Level 2

Systems and devices that are convenient for routine operation, but are not required for safe operation.

Exit Request Switches
Camera System
Oxygen Deficiency Hazard Monitoring System
PLC hardware and software that control Level 2 devices

Level 1

Systems and devices used for status or information only.

PSS Display Computers
Access Logging System
PLC - Computer Interface
Networking and Fiber Optics
Display Components (lamps, bezels, etc.)
PLC hardware and software that control Level 1 devices

APPENDIX B. DEFINITIONS

Approval Signatures	The signatures required to approve a proposal, a design, or the contents of a document.
Configuration	The specific arrangement of hardware, software, and documentation of a system.
Configuration Change Request Form (CCRF)	The form required to initiate the PSS change process.
Critical Device	A specific accelerator device or beam line component that is used to ensure that the accelerator beam is either inhibited or cannot be transported into areas where people are present. (See Jefferson Lab Beam Containment Policy for further information.)
Department Head	The manager or acting manager of a specific department. (It is Jefferson Lab policy that all managers designate someone as their replacement during an absence from the lab.)
Device	A specific piece of equipment. (For example: a horn, a radiation monitor, a Run/Safe box, a cable, a connector.)
Display Software	The program(s) that provide status monitoring of the Master PLCs. These reside in the Monitor Computer in the PSS console.
Firmware	Specialized programs (such as network communication handlers) that are resident in programmable memory devices or programmable logic devices. (Note: in the context of the PLCs these devices are preprogrammed by the vendor and are not reprogrammable by Jefferson Lab staff.)
Group Leader	The manager or acting manager of a specific group. (It is Jefferson Lab policy that all managers designate someone as their replacement during an absence from the lab.)
Jumper Request Form (JRF)	A form required for review and logging of jumpers in the PSS.
Master Document	The original or revised, signed, approved, hard copy of a document that is under configuration control.
Master Storage	The location of storage for the Master Documents.
Observer	Someone assigned to review specific repairs of the PSS and the subsequent tests. The observer is only required to view the results of a task .
PLC Ladder Logic	The functional safety logic for interlocks and access control that resides in a segment PLC.
PLC Application Software	These are utility programs used for programming, file transfer, monitoring, and documenting the PLC Ladder Logic.
Preliminary Document	A document that has not been signed or approved and is not yet under configuration control.
Programmable Logic Controller (PLC)	A standalone industrial computer module with a specially designed architecture that processes specific instructions for its associated input and output modules.
Programmable Memory Device (PMD)	Any memory component that is user programmable.

APPENDIX B. (CONT.)

Programmable Logic Device (PLD)	Any logic component that is user programmable.
Personnel Safety System (PSS)	A system of sensors, logic subsystems, and final control elements for the purpose of detection and mitigation of hazards. The Jefferson Lab Personnel Safety System is required to mitigate prompt radiation, exposed high voltage, and ODH hazards.
Requirement	A mandatory capability or feature.
System	A group of devices that serve a safety function.
Temporary Operational Safety Procedure (TOSP)	This document defines the equivalent safety procedures to be used while the original method of mitigating a hazard is temporarily not available.
Work Authorization Form (WAF)	A form required for making repairs to the PSS.

APPENDIX C. CONFIGURATION CHANGE REQUEST FORM

See attached form.

APPENDIX D. WORK AUTHORIZATION FORM

See attached form.

APPENDIX E. JUMPER REQUEST FORM

See attached form.