

# SNS OPERATIONS PROCEDURES MANUAL



## SNS-OPM 3.A-8.1


**Configuration Management Procedure for the Following Certified Credited Engineering Controls: Personnel Protection System (PPS), Oxygen Deficiency Hazard (ODH) System, Transfer Bay Access Control (TBAC), Service Bay Differential Pressure Monitoring System (SBDPMS) and Target Protection System (TPS)**

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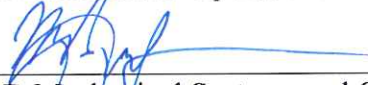
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## SNS-OPM 3.A-8.1

### **Configuration Management Procedure for the Following Certified Credited Engineering Controls: Personnel Protection System (PPS), Oxygen Deficiency Hazard (ODH) System, Transfer Bay Access Control (TBAC), Service Bay Differential Pressure Monitoring System (SBDPMS) and Target Protection System (TPS)**

#### **1. Purpose**

1.1 This document describes the method by which **non-temporary** changes to hardware, software, and documentation will be managed for the following certified Credited Engineering Controls (CEC):

- Personnel Protection System (PPS),
- Oxygen Deficiency Hazard (ODH) System.
- Target Bay Access Control (TBAC),
- Service Bay Differential Pressure Monitoring System (SBDPMS) and
- Target Protection System (TPS).

These requirements supplement the OPM 09-A-01 SNS Configuration Management Policy.

1.2 This procedure requires for each proposed change:

- An Unreviewed Safety Issue Determination (USID) be performed for proposed changes to the above CECs,
- Independent engineering and safety reviews required by OPM 9.A-2 SNS System, Structure, Component or Software Development Procedure and OPM 9.A-3 SNS System, Structure, Component or Software Change Procedure are performed as appropriate,
- Review and approval by the SNS Accelerator Configuration Control Committee, augmented by the SNS Accelerator Operations Manager and the SNS Mechanical Systems and Operations Group Leader, and
- Final approval by the SNS Operations Manager.

1.3 Temporary changes shall be processed in accordance with SNS-OPM 3.A-8.2. “Control of Temporary Hardware Changes/Bypasses in the following Certified Credited Engineering Control (CEC) systems: Personnel Protection System (PPS), Oxygen Deficiency Hazard (ODH) System, Transfer Bay Access Control (TBAC), Service Bay Differential Pressure Monitoring System (SBDPMS) and Target Protection System (TPS).

#### **2. Responsibilities**

2.1 The SNS **Protection Systems Team (PST) Leader** is responsible for ensuring that all proposed system changes are processed in accordance with this document, and for ensuring that related procedures and requirements are properly addressed.

- Control of Temporary Hardware Changes/Bypasses for the following Certified Credited Engineering Control (CEC) systems: Personnel Protection System (PPS), Oxygen Deficiency Hazard (ODH) System, Transfer Bay Access Control (TBAC), Service Bay Differential Pressure Monitoring System (SBDPMS) and Target Protection System (TPS) (SNS-OPM 3.A-8.2)Maintenance for Credited Engineering Controls (SNS-RAD-ICS-PR-0011).
- Post Maintenance Testing for Credited Engineering Controls (SNS-RAD-ICS-PR-0012).
- Software for Credited Engineering Controls (SNS-RAD-ICS-PR-0014).

2.2 The **Operations Contact** is responsible for reviewing the proposed change and for ensuring that additional reviews are obtained as specified in this procedure. The Operations Contacts are:

<b>System</b>	<b>Operations Contact</b>
<input type="checkbox"/> Accelerator PPS <input type="checkbox"/> LINAC and CHL ODH	RAD Accelerator Operations Manager or designee
<input type="checkbox"/> Target PPS <input type="checkbox"/> TBAC <input type="checkbox"/> SBDPMS <input type="checkbox"/> TPS	RAD Mechanical Systems and Operations Group Leader or designee
<input type="checkbox"/> Instrument PPS/ ODH	ISD Instrument Support Group Leader or designee

- 2.3 The appropriate Safety Committee(s) – e.g. Radiation Safety Committee (RSC), Instrument Systems Safety Committee (ISSC), Cryogenic Safety Committee (CSC), or Electrical Safety Committee (ESC) – is (are) responsible for review of proposed changes or modifications to the CECs in the scope of this procedure. Normally the corresponding safety officer provides oversight. However, the safety officer or committee chairman may require a review by the full committee.
- 2.4 The SNS Safety Documentation Manager shall perform USI determinations for proposed changes as requested by the Protection Systems Team Leader.
- 2.5 The SNS Accelerator Configuration Control Committee shall review all proposed changes to CECs within the scope of this document.
- 2.6 The SNS Accelerator Operations Manager and the SNS Mechanical Systems and Operations Group Leader shall serve on the SNS Accelerator Configuration Control Committee when proposed changes in the scope of this document are reviewed.

2.7 The SNS Operations Manager shall review and provide final approval of proposed changes in the scope of this document.

### 3. **Prerequisites**

3.1 The **System Engineer** shall ensure that the drawings, specifications, test procedures, and other design documents present a verifiable engineering description of the CEC with an emphasis on demonstrating the benefits, validity, and conformance with system design principles and architecture. Test procedures shall ensure that system operability can be demonstrated after implementation of approved changes. These drawings/documents shall conform to appropriate SNS Configuration Control and Document Control requirements.

### 4. **Precautions**

4.1 None.

### 5. **Procedure**

#### 5.1 Change Control Procedure

The **PST Leader** or **System Engineer** reviews proposed changes to determine the change level (1 or 2).

##### 5.1.1 **Level 1**

A Level 1 modification represents a change to the function or design of the CEC, requires a USID and a Permanent Change Request form SNS-OPM-ATT 3.A-8.1.a. Changes may include:

- Change to any safety functions performed by the CEC.
- Software changes requiring a PLC Programming computer
- Non “like-for-like” or equivalent hardware changes.

##### 5.1.2 **Level 2**

A Level 2 modification represents a modification but no change to the function or design of the CEC. Changes of this type are characterized by Like for Like replacement of components, where like for like is defined as the same manufacturer and model number for the component. Equivalents may be used instead of “Like for Like” if they have been approved using SNS-OPM-ATT 3.A-8-1.b SNS Equivalency Form for Credited Engineering Controls but require documentation in the SNS Work Control System and an approved test plan.

Level 2 changes do not require documentation using the Permanent Change Request (PCR) form (SNS-OPM-ATT3.A-8.1.a) but require documentation in the SNS Work Control System and an approved test plan.

## 5.2 Review of Level 1 Changes

- 5.2.1 The **System Engineer** prepares the basic review package including detailed drawings, specifications, test procedures, and other design documents to justify, analyze, and document proposed implementation the change.
- 5.2.2 The System Engineer develops necessary functional test procedures for the hardware/software modification. The test procedures shall facilitate the recording of test results and provide objective evidence of the test result review. The EPICS display is exempt since it does not contain command code, and has only read back functionality. **All test procedures must address appropriate confirmation of CEC system operability after the change is implemented.**
- 5.2.3 Modifications to the CEC PLC software shall be conducted in accordance with the applicable software quality assurance plan.
- 5.2.4 The **PST Leader** must determine if the proposed change affects current system certification procedures. If certification procedures are affected the proposed procedure revisions, in accordance with the [SNS-OPM 1.A-2](#) “SNS-OPS Plans, Policies, and Operating Procedures” shall be included in the documentation package. Review and concurrence, as described above, is required on all revised certification procedures.
- 5.2.5 The operations contact determines whether the proposed change(s) suggest retraining of the Operations Staff and/or other personnel and determine any impacts to operational procedures. Requirements for retraining or impacts on other operational procedures must be included in the review package.
- 5.2.6 The PST leader shall review and then provide the complete documentation review package for the proposed change to the SNS Safety Documentation Manager.
- 5.2.7 The SNS Safety Documentation Manager shall perform an Unreviewed Safety Issue Determination (SNS-OPM-2.B-10)

- 5.2.8 If a proposed change to a CEC is determined to involve a positive Unreviewed Safety Issue it shall not be implemented without prior DOE approval.
- 5.2.9 The PST Leader shall submit the proposed change together with the USID documentation to the following reviewers:
- Operations contact and others as deemed necessary by the operations contact.
  - The cognizant Safety Officer(s) and Committees (e.g. Radiation, Instrument, Electrical, or Cryogenic).
- 5.2.10 The PST Leader shall ensure resolution of comments generated by the reviews specified in Step 5.2.9.
- 5.2.11 The PST Leader shall submit the revised change package to the augmented SNS Accelerator Change Control Committee for review.
- 5.2.12 The augmented SNS Accelerator Change Control Committee shall review and comment on the proposed change.
- 5.2.13 The PST Leader shall ensure resolution of comments generated by the reviews specified in Step 5.2.12.
- 5.2.14 The SNS Accelerator Change Control Committee determines whether the proposed change should be forwarded to the SNS Operations Manager for final approval.
- 5.2.15 The SNS Operations Manager consults with staff as appropriate and renders final disposition for the proposed change.

### 5.3 Review of Level 2 Changes

- 5.3.1 The **System Engineer** prepares the information in support of the proposed change.
- 5.3.2 The **Protection System Team Leader** and **Operations Contact** review the proposed change.
- 5.3.3 The System Engineer addresses review comments.
- 5.3.4 The Protection Systems Team Leader approves the Level 2 change.

### 5.4 Implementation of Level 1 Changes to the System

- 5.4.1 The System Engineer prepares a Level 1 Work Package for the change in accordance with “SNS Site Work Control” (SNS 108000000-PR0061).
- 5.4.2 The Protective System Team Leader shall assign a competent individual to conduct an independent review of the Level 1 Work Package.
- 5.4.3 For changes that require that the CEC be taken out of service to implement the change use a Temporary Change/Bypass Request Form to take the CEC out of service and return the CEC to service after the change is complete.
- 5.4.4 If, during implementation of the change, an error is discovered which would require changes to the released drawings, specifications, test procedures, or other design documents, the implementation shall stop, and a full review of the change will be conducted prior to further implementation. If necessary, the system will be restored to the original condition and recertified until the change is ready for implementation.

#### 5.5 Change Closeout

- 5.5.1 Conduct post modification tests per procedures developed in Steps 5.2.2 and 5.2.3, **including any required operability certification.**
- 5.5.2 The appropriate Operations Manager shall review any required operability certifications.
- 5.5.3 Return the CEC to service using the Temporary Change/Bypass Request form that was implemented to take the CEC out of service.
- 5.5.4 Incorporate changes into the baseline drawings, specifications, test procedures and any other design documents.

#### 5.6 Hardware Security and Labeling

- 5.6.1 Keys necessary for operation of the CEC Control Panels and any spare keys shall be controlled by the responsible organization or individual.
- 5.6.2 The enclosures, wiring, interlocked chipmunks, etc., shall be appropriately labeled so as to identify them as part of a CEC. Critical devices, and any other appropriate device, shall be labeled with yellow warning tags. Enclosures (except those that require tools to open) shall be kept locked except during testing or maintenance. If any operational software or hardware is perceived to deviate from the approved design basis or ASE it shall be reported to PST Leader, the RAD Operations Manager, the ISD SNS Instrument Operations Manager, the RAD ES&H Coordinator and/or the SNS Operations Manager for evaluation and appropriate action.

During accelerator operation:

- The **Control Room Shift Supervisor** may stop beam operation immediately if this is perceived to be a threat to personnel safety or a possible violation of the ASE.
- Shall be reported immediately to the persons specified above.
- Shall be recorded in the Operations Logbook.

**WARNING:**

If a deviation from the approved design is present, then unsafe operation of the system may occur. RS Hold of the area per SNS-OPM 2.H-18.3 “Hold for Radiation Safety” shall be required until a review is conducted.

For issues concerning the ODH Systems, it may be necessary to restrict personnel access to affected areas until a review is conducted.

5.6.3 The System Engineer or designee must obtain permission from the SNS Operations Manager in order to use the secured PPS Lock Box key which is under the control of the Accelerator Operations Group OPM 6.A-10.

5.6.4 During accelerator shutdown, after confirmation of appropriate RS Hold, or as a part of a CEC certification procedure, or during maintenance periods, after confirmation by the duty Control Room Shift Supervisor of RS Hold, Operations may provide operation keys for the duration of active testing. When any key is removed/returned to either lockbox, it shall be logged by operations.

5.7 Control of Documentation and Software

Upon authorized release by the **PST Leader**, the PLC source code and relevant documentation, including release history, shall be maintained per procedure Safety System Equipment Software (SNS-RAD-ICS-PR-0014).

5.8 Control of Special CEC Test Equipment

Except for standard tools, voltmeters, etc., any dedicated devices that could degrade functionality that are needed for system testing; i.e., special jumper/clips, mechanical door switch bypasses, etc., shall be:

- Predefined in the respective test procedure.
- Stored in the PST lab.
- The **PST Leader** or designee verifies that they are returned to the lockbox via a signature on the appropriate test procedure.

All electronics, oscilloscopes, voltmeters, etc., shall be calibrated to within



acceptable parameters and at intervals specified by the manufacturer.

#### 5.9 Electronic Logbook

The Electronic Logbook (logbook) shall be used to document problems discovered during the test and operational phases of CECs covered by this procedure.

5.9.1 Problems found during testing of a CEC shall be tracked by entering them in the logbook

5.9.2 Problems found during CEC operation shall be immediately reported as required in 4.6.2 and shall also be entered in the logbook.

#### **CAUTION:**

If a deviation from the approved design is present, then unsafe operation of the system may occur. RS Hold of the area per [SNS-OPM 2.H-18.3](#) "Hold for Radiation Safety" shall be required until a review is conducted.

### 6. Documentation

6.1 Electronic Logbook entries.

6.2 PCR Form ATT 3.A-8.1.a and supporting design documentation.

6.3 Installation work package, including post maintenance test documentation.

### 7. References

7.1 OPM 09.A-01 SNS Configuration Management Policy.

7.2 OPM 09.A-2 SNS Design Development Procedure.

7.3 OPM 9.A-3 SNS System, Structure, Component or Software Change Procedure.

7.4 SNS Quality Assurance Plan (SNS-QA-P01).

7.5 SNS-OPM 2.B-10. Conducting Unreviewed Safety Issue Determinations (USIDs).

7.6 SNS Site Work Control (SNS 108000000-PR0061).

7.7 Post Maintenance Testing for Credited Engineering Controls (SNS-RAD-ICS-PR-0012).

7.8 Safety System Equipment Software (SNS-RAD-ICS-PR-0014).

- 7.9 Maintenance for Credited Engineering Controls (SNS-RAD-ICS-PR-0011).
- 7.10 Key Control for Credited Engineering Controls (SNS-RAD-ICS-PR-0013).
- 7.11 SNS-OPM 1.A-2. SNS-OPM Plans, Policies, and Operating Procedures.
- 7.12 SNS-OPM 3.A-8.2. “Control of Temporary Hardware Changes/Bypasses in the following Certified Credited Engineering Control (CEC) Systems: PPS, TBAC, SBDPMS and TPS”.
- 7.13 SNS-OPM 2.H-13. “Hold for Radiation Safety (RS Hold)”.

**8. Attachments**

- 8.1 [SNS-OPM 3.A-8.1.a](#). Credited Engineering Control (CEC) Permanent Change Request Form
- 8.2 [SNS-OPM 3.A-8.1.b](#) SNS Equivalency Form for Credited Engineering Controls (CEC)

## 9. Revision History

- Rev. 6 August 7, 2013 – Added **Section 2.4** Configuration Control, new link, 8.2, in **Section 8** and added **Section 9** Revision History. Removed **Sections 5.1.2.2, 5.1.2.3**. Remove the information pertaining to Level 1C & 1B from **Section 5.2.2**. Modified wording throughout procedure to fit with the removal of Level 1C & 1B information.
- SNS-OPM-ATT 3.A-8.1.a - Rev. 2 August 7, 2013 – Added **Block E** Accelerator Configuration Control Committee. Replaced Levels 1A, 1B, & 1C with Level 1 in **Blocks D, J, K & L**.
- SNS-OPM-ATT 3.A.8.1.b – Rev. 0 August 7, 2013 – Created OPM.