Princeton Plasma Physics Laboratory
Procedure

Procedure Title: Control of Equipment and System Status (Chain of Command)

Number D-OP-AD-56	**Revision: 8**	Effective Date: 7/25/15 Expiration Date: 7/25/18 *(2 yr. unless otherwise stipulated)*

Procedure Approvals

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Responsible Department: Engineering and Infrastructure

Procedure Requirements
designated by RLM

LABWIDE:

	Work Planning Form #_____(ENG-032)		Lockout/Tagout (ESH-016)
	Confined Space Permit (5008, Sec. 8, Chap 5)		Lift Procedure (ENG-021)
	Master Equip. List Mod (MC-002/003)		ES&H Review (NEPA, IH, etc.)
	RWP (HP-OP-20)		Independent Review
	ATI Walkdown		Pre-job Brief
	Post-job Brief		Hazard Analysis
	Run Copy Required (performance of procedure must be documented and archived per ENG-030 page 10)		Special archiving requested for completed Run Copies:_____

D-SITE SPECIFIC:

	D-Site Work Permit (OP-AD-09)		Door Permit (OP-G-93)
	Work on Tritium Contaminated Systems. (OP-AD-77)		Activity Certification Committee Review
	Pre-job brief (ENG-030)		T-MOD (ENG-036)

REVIEWERS (designated by RLM)	
Accountable Technical Individual	A.vonHalle
Test Director	
Independent Reviewer	
D-Site Shift Supervisor	W. Blanchard, R. Camp, H. Carnevale, C. Gentile
Construction	E. Perry
D-Site Caretaking	
Vacuum	
Computer	
Tritium	
Quality Assurance/Quality Control	
AC Power	
Maintenance and Operations Division	
Energy Conversion Systems	
Engineering	M. Williams
NSTX-U	M. Ono, J. Menard
Water Systems	
Neutral Beam (Heating Systems Branch of Electrical Engineering)	
Radiofrequency (Heating Systems Branch of Electrical Engineering)	
Diagnostics	
Environmental, Safety, & Health	
Project Management	T. Stevenson

TRAINING (designated by RLM)

No training required _____ Instructor _____

Personnel (group, job title or individual name)	Read Only*	Instruction	Hands-On
Users	X		
NSTX Accessors	X		

Training Rep. _____

RLM Mike Williams Digitally signed by Mike Williams DN: cn=Mike Williams, o=PPPL, ou=Engineering and Infrastructure, email=williams@pppl.gov, c=US Date: 2015.07.25 11:57:02 -05'00'

* "Read Only" training for Administrative, Alarm Response, and Emergency Operations procedures must be documented on a Record of Training form. The completed Run Copy will serve as the documentation of "Read Only" training for all other types of procedure

CONTROL OF EQUIPMENT AND SYSTEM STATUS

OP-AD-56, REVISION 7

TABLE OF CONTENTS

1.0 PURPOSE

Provide directions for maintaining control of D-site systems and equipment.

2.0 SCOPE

This procedure is applicable to all PPPL personnel who are involved in D-site plant status including those supporting operations, maintenance, construction, and installations concerning:

A. Systems, components and devices that are to be maintained operable to support experimental operations, maintenance, construction or caretaking.

B. Systems, components or devices important to personnel system safety.

Control of equipment and system status is to be exercised using the chain-of-command shown in Fig. 1. During operations of various systems the D-site Shift Supervisor will approve and coordinate activities of the D-site Cleanroom/Decon Facility Supervisor, the Tritium Systems Supervisor, the Rad Waste Storage Facility (RWSF) manager and the Chief Operating Engineers involved in the operation of experimental devices at D-Site. During periods of maintenance, repairs, installations, and D-site caretaking activities, the D-site Shift Supervisor will approve and coordinate activities of the Construction Manager(s) which impact facility equipment.

3.0 REFERENCES

DOE Order 422.1, Conduct of Operations for DOE Facilities
ENG-036, Control of Temporary Modifications
OP-AD-09, D-Site Work Permit System
ENG-030, Technical Procedures for Experimental Facilities
ENG-032, Work Planning Procedure
OP-AD-39, D-Site Conduct of Operations
OP-AD-77, Work on Tritium Contaminated Systems
OP-AD-107, Decon Facility Operations Procedures
ESH-016, Control of Hazardous Energy Sources Via Lockout/Tagout of Energy Isolation Devices
GEN-006, Occurrence Reporting and Processing of Operations Information
PPPL Emergency Preparedness Plan

4.0 RESPONSIBILITIES

4.1 D-Site Manager

The Head, Engineering and Infrastructure, or designee, directs D-site facility operations and control of equipment and system status via the D-Site Operations

Manager and in accordance with directives of PPPL procedures approved by the PPPL Director as indicated in Fig. 1. The D-Site Manager shall be responsible for the configuration of the D-Site facility, and the maintenance of drawings and other documentation related thereto. The D-Site Manager shall be the Responsible Line Manager (RLM) for D-Site except when that responsibility is otherwise delegated.

4.2 NSTX-U Project Director/ Program Director

Manage NSTX-U Experimental Operations utilizing resources as described in Figure 2, and within the controls described in this procedure.

Coordinates project response to any off-normal conditions through the D-Site Manager.

4.3 D-Site/NSTX-U Operations Manager, appointed by the D-Site Manager, shall be responsible for:

Directing and coordinating D-site facility operations and control of equipment and system status, with equipment safety and protection of the health and safety of plant personnel and the public receiving the highest priority.

Acting as the Accountable Technical Individual (ATI) for the overall coordination and conduct of activities at D-Site.

Ensuring that meetings are held for the purpose of scheduling work to be performed on D-Site equipment, systems, and support systems. It is the intent that all substantial work activities, including construction activities, be scheduled at this Rollover Meeting.

Control and documentation of the configuration of equipment within the NSTX-U Test Cell.

Determination of operating procedures and operating limits related to safe operation of the NSTX-U device in support of the NSTX-U experimental program.

4.4 D-Site Shift Supervisors shall be responsible for:

Coordinating the activities of operations, construction, radiological protection, maintenance/repair, installations, instrumentation and control, and security groups to accomplish the objectives for the shift.

Informing the D-Site Operations Manager of any abnormal system conditions or safety concerns.

Ensuring that shift activities are conducted in accordance with procedures.

Ensuring deficiencies are identified and corrective actions are initiated.

Maintaining the Shift Supervisor's log.

Ensuring that the emergency operating procedures are correctly implemented during emergency plant conditions.

Acting as emergency director/coordinator unless and until relieved by the incident commander as defined in the PPPL Emergency Preparedness Plan.

Notifying higher management authority as required by plant reporting and notification requirements.

Supervising the on-site facility operations functions required by the Emergency Plan, Health Physics Manual, Security Plan, and their respective implementing procedures.

Provide close oversight of activities supporting complex and infrequently performed plant evolutions.

Authorizing all D-Site work permits including NSTX-U construction and operations, Test Cell Caretaking, and Tritium Area.

Authorizing the removal of equipment and systems from service for maintenance, testing, or operational activities.

Authorizing the return to service of equipment and systems following maintenance, testing, or operational activities that require non-standard configurations.

Initiating reports of abnormal activities and reportable occurrences.

Informing the Tritium Systems Supervisor of any changes in equipment or system status relevant to the Tritium systems or any events which could impact procedural or regulatory compliance.

Ensuring all personnel reporting to them are aware of current plant status in their areas of responsibility.

4.5 NSTX-U Chief Operating Engineers (COE) shall be responsible for:

Directing the activities associated with the operation of NSTX-U such as machine and subsystem operations including power systems, heating systems and instrumentation/control based on direction from the D-Site Shift Supervisor and the D-Site/NSTX-U Operations Manager. The COE's role applies to the operating phase of NSTX-U activities, and not to all of D-Site or all construction phase activities.

Keeping the D-Site Shift Supervisor and the D-Site/NSTX-U Operations Manager informed of the status of systems and equipment under their responsibility.

Informing the D-Site Shift Supervisor of any out of limit/abnormal system conditions or ES&H concerns.

4.6 Tritium Systems Supervisor shall be responsible for:

Directing changes in the status and operation of equipment or systems in the tritium systems area based on direction from the D-Site Shift Supervisor.

Maintaining compliance with applicable operating equipment requirements.

Keeping the D-site Shift Supervisor informed of the status of systems and equipment under their responsibility.

Informing the D-site Shift Supervisor of all equipment and safety concerns.

Informing their immediate supervisor and the D-Site Shift Supervisor of any abnormal system conditions or safety concerns.

Ensuring all personnel reporting to them are aware of current equipment status in their areas of responsibility.

Approving changes in Tritium/HVAC systems equipment or status via work permits/T Mods as authorized by the D-Site Shift Supervisor.

Overseeing the activities of all personnel performing work in the Tritium Systems Areas based on direction from the D-Site Shift Supervisor.

Approving work permits as authorized by the D-Site Shift Supervisor.

Participating in the rollover/scheduling meetings.

4.7 D-Site Cleanroom/Decon Facility Supervisor shall be responsible for:

Directing activities of personnel involved in Decon Facility Operations, Clean Room Operations and Ion Source assembly.

Keeping the D-Site Shift Supervisor informed of the status of systems and equipment under their responsibility.

4.8 Construction Manager shall be responsible for:

Overseeing the activities of the personnel performing construction work at D-site such as Test Activities, Machine Construction and NSTX-U Outage Management, assuring compliance to OSHA regulations and lab procedures. The Construction Manager's role applies to experimental Area construction activities, and not to NSTX-U operations activities

Preparing work permits for authorization by the D-site Cleanroom/Decon Facility Supervisor, Tritium Systems Supervisor, or D-site Shift Supervisor as applicable.

Participating in the rollover/scheduling meetings.

4.9 Rad Waste Storage Facility Manager shall be responsible for:

Coordinating the handling, characterization, and packaging of all radioactive materials including which includes items for storage and disposal.

Providing packaging, such as, B-25 boxes, drums and high integrity containers (HICS) for storage and disposal of radioactive materials.

Assisting in the proper documentation of all items for storage and disposal of radioactive materials.

Coordinating all radioactive waste processing including; waste compacting, scintillation vial crushing, high integrity container loading, liquid solidification, etc., in the RWSF.

Providing guidance and instruction to project personnel for the proper and efficient methods of radioactive waste characterization and packaging.

Providing a single point of contact between the laboratory and burial Facilities.

4.10 PPPL Division Heads shall be responsible for:

Ensuring that personnel under their direction are aware of the contents of this procedure and that authority is delegated to the appropriate individuals responsible for compliance with this procedure.

Ensuring that equipment under their responsibility is maintained, with appropriate records of maintenance.

Ensuring that staff assigned to D-Site operations are properly trained.

4.11 D-site Personnel shall be responsible for:

Reporting any changes in equipment or system status to the D-site Shift Supervisor through the chain of command shown in Figure 1.

Reporting any plant ES&H concerns to their immediate supervisor and informing the D-site Shift Supervisor (through the chain of command) of any events which could impact operating equipment requirements.

4.12 The primary objective for the use of System Engineers is to optimize overall engineering support by assigning system ownership. Other benefits to be derived are improved communication, coordination and proactive involvement of the engineers in system performance. Overall responsibility for a system, which may be comprised of several subsystems will reside with the System Engineer. All changes in the system design or operating limits must be approved by the System Engineer. In some organizations the name System Cognizant Engineer and Cognizant Engineer are used for this position.

System Engineers shall be responsible for:

a) Ensuring that equipment is maintained in good condition via a suitable preventative maintenance program.

b) Ensuring that test equipment is maintained and calibrated.

c) Ensuring that system operating, maintenance, and repair procedures are current and in force.

d) Ensuring that equipment is properly labeled per all applicable industry standards.

e) Evaluating system performance as follows:

Performing work site inspections to identify and correct problems involving personnel performance, policies and procedures, housekeeping, material condition, and personnel hazards.

Perform regular reviews of logs, trends, failure reports, maintenance procedures and repair procedures to identify problems, specify corrective actions and recommend methods to improve overall reliability.

Observe system operation and perform periodic system walk-downs to maintain a current awareness of system condition and performance.

Evaluate surveillance test results and take corrective action to correct anomalies. Surveillance testing should be periodically observed.

Assist in conducting special system tests and evaluate test results.

f) Performing the following functions for new designs and modifications:

Review and/or approve system and subsystem design documentation.

Review for conformance to the relevant sections of national/state codes and standards as specified in DOE Orders and PPPL Procedures Manual.

g) Providing operations and maintenance support as follows:

Maintain up-to-date drawings of operating systems and ensure that system operators are working with current drawings

Prepare installation, operating, maintenance, repair and test procedures.

Participate in the preparation of JHA and NEPA evaluations.

Coordinate system activities with other project activities.

Assist in the investigation of reportable occurrences or operating events and in the preparation of associated reports and root cause determinations.

Prepare system descriptions and training lesson plans.

Assist D-site Shift Supervisors in determining system and area readiness for startup and provide technical support to operations as needed.

Implement T-Mods per procedure ENG-036.

4.13 Health Physics shall be responsible for:

Assisting in the control of exposure to radiation and radioactive materials consistent with regulatory requirements, procedures and HP procedures.

Coordinating HP support with the D-Site Operations Manager or a D-site Shift Supervisor in his absence. The D-site Shift Supervisor shall determine priorities of scheduled activities based on available HP staffing as the need arises. This coordination shall be done in concert with the ES&H HP group.

Posting of radiological controlled areas (RCAs) and issuing Radiation Work Permits for activities conducted within those areas.

Providing internal and external dosimetry services for RCA access.

Performing daily and as needed radiological surveys which show the current radiological conditions at D-site and posting the surveys.

Maintaining radiation detection instruments including calibrations, timely repairs, and replacement of monitors required for continued operations.

4.14 The ORPS Facility Manager (per GEN-006) is the individual(s) assigned the responsibility of providing response to events or conditions, which have the potential to have ORPS or PAAA implications. The Facility Manager has the authority to direct changes, recall and assign personnel, and/or commit resources to stabilize or mitigate the event or condition and to implement corrective actions

5.0 PROCEDURE

5.1 Status Change Authorization and Reporting

5.1.1 The D-Site Shift Supervisor shall be responsible for maintaining proper system configuration and shall authorize status changes to major equipment and subsystems in accordance with procedures.

5.1.2 Status changes to D-Site related equipment and systems shall be passed down to the on-coming D-Site Shift Supervisor and shall be documented in the D-Site Shift Supervisor log.

5.1.3 The D-Site Shift Supervisor shall ensure that all changes in status are communicated to the affected operators and personnel via the chain of command of Fig. 1.

5.1.4 Changes in the status of D-Site equipment and systems shall be reported to the D-Site Shift Supervisor.

5.1.5 Changes in the status of tritium related equipment and support systems shall be completed as follows:

1. All work shall be scheduled via the rollover meeting and approved by the NSTX-U Chief Operating Engineer, Construction Manager, Tritium System Supervisor, Decon/Cleanroom Facility and Rad Waste Storage Facility Managers, as appropriate, and the D-Site Shift Supervisor.

2. Any major work (as defined in OP-AD-09) shall have approval of the D-Site Shift Supervisor prior to being performed.

3. Authorization shall be obtained from the D-Site Shift Supervisor (via his signature on the work permit) immediately prior to work being performed on critical systems. When the change has been made it will be reported back to the D-Site Shift Supervisor via closeout of the work permit.

5.2 Equipment and System Alignment

5.2.1 Prior to placing equipment or systems into operation following an extended outage or maintenance/repair work, individual components for facility equipment and systems shall be properly aligned or checked for proper alignment.

5.2.2 Alignment checklists in the form of a system procedure, operations procedure, PTP, ISTP, etc., shall be used to guide the operator in establishing the correct component positions.

Alignment checklists should include:

1. Provisions for equipment nomenclature that matches the nomenclature placed on the component.

2. A location for individual documentation of the check of each component.

3. The required alignment position of each component.

4. A location for annotating deviations from the required alignment.

5.2.3 Alignment checklists shall be reviewed as part of the procedure process.

5.2.4 Equipment and systems related to Tritium Safety shall be functionally tested in accordance with surveillance requirements following maintenance and before the equipment or system is considered capable of performing its designed function.

5.2.5 Records of established equipment and system alignments should be retained for reference by the operating shift and a copy shall be forwarded to the operations center.

5.3 Equipment Locking and Tagging

5.3.1 Control of locked or tagged devices shall be in accordance with ESH-016 (Control of Hazardous Energy Sources Via Lockout/Tagout of Energy Isolation Devices) and OP-AD-39 (D-Site Conduct of Operations).

5.4 Equipment Deficiency Identification and Documentation

5.4.1 Personnel who identify equipment deficiencies shall document the deficiency and notify the D-Site Shift Supervisor who will notify the Tritium System Supervisor, and/or the Construction Manager, Decon/Cleanroom Facility Supervisor, and the NSTX-U Chief Operating Engineer if the deficiency impacts their systems.

5.4.2 A dedicated log of deficient equipment shall be kept by each cognizant individual to ensure that equipment deficiencies within their area of responsibility are communicated to personnel responsible for monitoring and operating the equipment.

5.4.3 The D-Site Shift Supervisor will notify the D-Site Operations Manager to obtain authorization to proceed with operations if equipment is deemed deficient.

5.4.4 Equipment shall be repaired or replaced as soon as possible.

5.5 Work Authorization and Documentation

5.5.1 To the greatest extent possible, all work at D-Site shall be scheduled via the rollover meeting in which a D-Site Shift Supervisor shall be in attendance.

5.5.2 All work in controlled areas (as defined in OP-AD-09) shall have approval of the D-Site Shift Supervisor prior to being performed.

5.5.3 Work authorization for the NSTX-U Test Cell, Tokamak Test Cell, Test Cell Basement, Upper and Lower DARMs, cable spread room, vacuum control room, pump room, MER, Tritium Systems, Decon/Clean Room, and the Rad Waste Storage Facility, as well as any equipment or systems that could impact normal operations (e.g. LECT, HVAC, sumps, etc.), shall be by work permit with signatures of the D-Site Shift Supervisor on the work permit as per OP-AD-09 (D-Site) Work Permit System.

5.5.4 Temporary changes shall be authorized by the D-Site Shift Supervisor in accordance with ENG-036 (Control of Temporary Modifications).

5.6 Equipment Post-Maintenance/Repair Testing and Return to Service

5.6.1 Equipment shall be tested following maintenance/repair to demonstrate that it is capable of performing its intended function.

Post Maintenance/Repair Testing shall include:

1. All functions that may have been affected by the maintenance/repair.

2. Verification that the maintenance performed introduced no new problems.

3. Verification that the repair performed served to correct the original problem and that no new problems were introduced.

5.6.2 Any testing following maintenance/repair shall be specified in the maintenance/repair procedure to ensure equipment is ready for return to service.

5.7 Systems Alarm Status

5.7.1 The status of control panel and/or local panel alarms shall be readily available to the appropriate personnel.

5.7.2 Status of Alarms shall be reviewed at least once per operating shift.

5.7.3 System Engineers may relay alarm status to the Site Protection Information Desk (Officer on Duty) if round the clock alarm monitoring is appropriate.

5.7.4 A system operating procedure shall be instituted and approved for each system requiring a specific alarm response.

5.7.5 Appropriate actions shall be taken to monitor equipment parameters for abnormal conditions that would be masked by deficient or non-re-flashing alarms.

5.7.6 System Alarms shall be reported to the Cognizant System Engineer, and to the D-Site Shift Supervisor as appropriate.

5.8 Temporary Modification Control

5.8.1 ENG-036 (Control of Temporary Modifications) shall be used for installation of temporary modifications.

5.9 Distribution and Control of Equipment and System Documents

5.9.1 Operations personnel shall receive and utilize the latest revisions of engineering drawings and specifications.

5.9.2 Affected operations personnel shall be made aware of all changes to these documents by the operations chain of Command.

5.10 Off-Normal Conditions on Experimental Facilities

5.10.1 The NSTX-U Project Director/Program Director oversee the implementation of the Operations Procedures that define experimental allowables as described in the NSTX-U Safety Assessment Document and Safety Certificate.

5.10.2 Conditions found to be "off-normal" from these approved Operations Procedures must be addressed in concert with the D-Site Manager, and within the controls described in this procedure.

Figure 1: D-Site Chain of Command

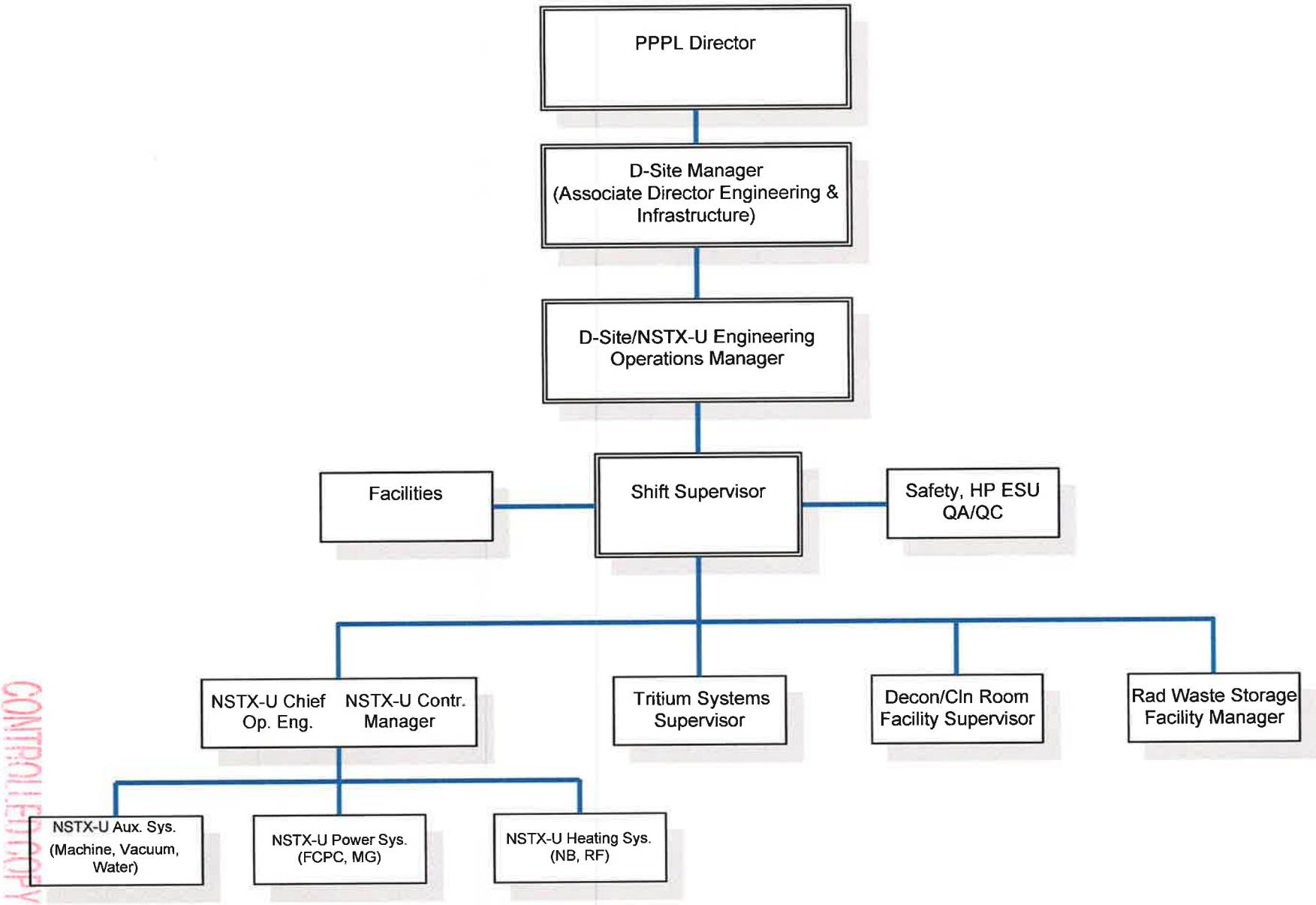

Figure 2: NSTX-U Experimental Operations