

**Princeton Plasma Physics Laboratory
Procedure**

Procedure Title: Access to NSTX Experimental Areas

Number OP-AD-117	Revision: 5	Effective Date: <i>5/16/14</i> Expiration Date: <i>5/16/17</i> (2 yr. unless otherwise stipulated)
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Procedure Approvals

Author <i>W. Blanchard</i>	W. Blanchard	Date <i>5-16-14</i>
ATI <i>A. von Halle</i>	A. von Halle	Date <i>5/16/2014</i>
RLM <i>M. Williams</i>	M. Williams	Date <i>5/16/14</i>

Responsible Division: Engineering Operations

**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 (GEN-005)	ES&H Review (NEPA, IH, etc.)
RWP (HP-OP-20)	Independent Review
ATI Walkdown	Pre-job Brief
Post-job Brief	Hazard Analysis

D-SITE SPECIFIC:

D-Site Work Permit (OP-AD-09)	Door Permit (OP-G-93)
Tritium Work Permit (OP-AD-49)	USQD (OP-AD-63)
Pre-job brief (OP-AD-79)	T-MOD (OP-AD-03)

REVIEWERS (designated by RLM)
Accountable Technical Individual
Test Director
Independent Reviewer
D-Site Shift Supervisor
NSTX
D-Site Caretaking
Vacuum
Computer
Tritium
Quality Assurance/Quality Control
AC Power
Maintenance and Operations Division
Energy Conversion Systems
Engineering
Environmental Restoration & Waste Management Division
Water Systems
Neutral Beam (Heating Systems Branch of Electrical Engineering)
Radiofrequency (Heating Systems Branch of Electrical Engineering)
Diagnostics
Environmental, Safety, & Health

TRAINING (designated by RLM)			
No training required _____		Instructor _____	
Personnel (group, job title or individual name)	Read Only*	Instruction	Hands-On
Staff with card access to the NSTX Test Cell	X		
Training Rep.			
RLM			

* "Read Only" training for Administrative, Alarm Response, and Emergency Operations procedures must be documented on a Record of Training form (attachment 6). The completed Run Copy will serve as the documentation of "Read Only" training for all other types of procedure

1.0 PURPOSE

The purpose of this procedure is to delineate the rules and requirements for access to the NSTX experimental areas and to the machine proper. The NSTX experimental areas consist of the NSTX Test Cell (NTC), the Cable Spread Room and Vacuum Control Room (VCR/CSR) and the in the TFTR Test Cell Basement (TCB caged area).

2.0 SCOPE

This procedure covers the access and restrictions to the NSTX experimental areas for Free Access, No Access and Controlled Access for maintenance and operational periods.

3.0 REFERENCES

OP-AD-09,	Work Permit Procedure
OP-NSTX-10,	Hot Access Requirements
OP-NSTX-14,	NSTX Machine Operations Guide for Startup, Shutdown ands Non-Run Day Tasks

4.0 SAFETY CONCERNS

There are significant electrical and radiological safety concerns in the experimental areas during operations and electrical safety concerns in the VCR/CSR and the TCB caged area. Magnetic materials left in the NTC could become projectiles as a result of the magnetic fields developed during operations. It is the responsibility of all persons working in the NTC, on the vacuum vessel, in the VCR/CSR and in the TCB caged area to work safely and carefully and to maintain a clean and orderly work area.

5.0 DEFINITIONS

Loop - A hardwired door security interlock for an experimental area. The loop must be set ("loop up") to generate an "Area Interlock Clear" signal to the Hardwired Interlock System (HIS). The Area Interlock Complete is a necessary requirement for machine operation. The loop will drop if an experimental area door is opened and all systems interlocked with the HIS will be disabled.

Free Access- This access mode is used when entry into the NTC is controlled by the badge readers at the north door and south doors of the NTC and entry is logged via the computerized badge reader logging system. Free Access is the typical access mode during maintenance and outage periods. A scrub is required after Free Access has been established before resuming operation of NSTX.

- The VCR/CSR and TCB caged area do not have a badge reader and this access mode does not pertain to these areas.
- Controlled Access- This is an administratively controlled mode of access used for limited activities in the NSTX experimental areas in order to control the flow of personnel and to preserve the scrub.
- No Access - In this access mode, the NTC doors are locked, the badge reader disabled and access is prohibited to the NTC. Additionally, the doors to the VCR/CSR and the TCB caged area are also closed and locked in the No Access mode. The areas can be in No Access with the loop up (enabled) or the loop down (disabled).
- Hot Access - This mode of access is controlled both administratively and with hardwired interlocks. There is a separate procedure (OP-NSTX-10) for this mode of access.
- Machine Access- This is access to the top of the machine proper (vacuum vessel). When personnel are working on the vacuum vessel extra precaution needs to be taken to ensure that material is not dropped into hard to access areas of NSTX.
- Scrub - This is a thorough inspection and cleaning of the torus and the entire Test Cell (or VCR/CSR) and the equipment within these areas.
- Area Scrub - A scrub that is restricted to an area or areas where a limited amount of work has been done during controlled access.
- Piggybacking- Entry where one or more persons are allowed to enter the Test Cell while being escorted with a person who is qualified for entry. This entry requires the authorization of a COE or D-Site Shift Supervisor. All staff must follow directions on the Radiation Work Permit for general access, including the requirements for personal dosimetry.
- Search and Secure - The act of completely inspecting an area for personnel to ensure that no people are left in the area when it is closed up. The persons conducting the search and secure shall call out for people to leave the area while making their inspection.

6.0 MAINTENANCE PERIODS

During maintenance periods on NSTX, the NTC will typically be in Free Access mode. Work permits are required for most of the work done in the NTC and personnel are required to comply with all of the requirements of the work permit. Inspections, routine checklists and simple routine activities (as defined by the COE/D-Site Shift Supervisor) do not require work permits. All personnel must exit the area when requested to leave by machine operations personnel.

7.0 OPERATIONS

During operations the NTC, VCR/CSR and TCB caged area are in No Access mode with the loop up and no entry is allowed into the NSTX experimental areas. The caged area in the TFTR Test Cell Basement is locked and warning lights in place during NSTX operations. Opening a door to the NTC, VCR/CSR or the TCB caged area will disable the high power systems.

Occasionally, accesses to the NTC will be required to complete limited but necessary tasks to carry on with operations. These accesses are done under Controlled Access and are intended to maintain a high level of control in order to avoid the necessity of an entire scrub of the machine and experimental area. It is important that the people entering the area are closely accounted for and the areas of work are kept scrubbed. The accessors will be escorted into the NTC by operations related personnel using the Access Key. The escort will keep the Access Key on his person and monitor the activities in the NTC to ensure that the scrub is maintained. At the conclusion of the Controlled Access, the escort will ensure everyone is clear of the NTC by performing a search and secure while calling out for personnel to leave the area. They will then set the loop, return the door key and inform the COE that the machine is ready for operation.

Controlled Access to the VCR/CSR during operations has similar requirements as those for access to the NTC. Persons accessing the area will be escorted in by operations related personnel using a door key. The person letting the accessors in shall keep the door key in his possession and ensure the door is locked behind the accessors. The loop shall not be set until the conclusion of the Controlled Access and the search and secure is complete.

After the conclusion of operations each day during a run period, a period of access is allowed in the NTC under the control of a machine technician. Personnel entering the NTC to do work must do so with the cognizance and concurrence of the machine technician such that the scrub will be maintained for the following run day. The experimental areas will typically remain in No Access during the off hours unless special arrangements have been made for Controlled Access.

8.0 TOURS

Tours are an important part of PPPL's activities and should be accommodated at NSTX when possible. Tours of NSTX are arranged through the Communications Office. If the tour takes place during times that the scrub must be maintained, a machine operations technician (or some other person designated by the COE or D-Site Shift Supervisor) must accompany the tour.