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| PPPL | PRINCETON PLASMA PHYSICS LABORATORY | PROCEDURE | No. ENG-036 Rev 1 page 1 of 6 |
| Subject: Control of Temporary Modifications | Effective Date: January 31, 2018 | Initiated by: Head, Engineering | |
| | Supersedes: ENG-036 Rev 0dated 8/8/05 | Approved: Director | |
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Management System (Primary): 03.00 Engineering
Management System Owner: Head, Engineering
Management Process: 03.07 Conduct of Operations
Process Owner: Head, Engineering
Sub-Process: 03.07.13 Operations Procedures
Sub-Process Owner: Head, Engineering
Subject Matter Experts (SMEs): Head, Engineer

Applicability

All Temporary Modifications (T-MODs) installed at the Laboratory shall be managed in accordance with this procedure, unless the activity is covered by a dedicated procedure or instruction or it is routine. This procedure does not replace or alter any of the requirements of the PPPL Safety Lockout/Tagout Procedures or the PPPL Environmental Safety and Health (ES&H) Manual, ES&HD-5008. PPPL operating organizations or projects may develop and implement local organization or project-specific T-MODs – these as a minimum shall meet the requirements defined herein including the mandatory review and approval authorities. The approval authorities noted herein are based on the application of the Graded Approach and resulting quality levels (i.e. A-1, A-2, A-3) defined in the PPPL QA Program Description (QAPD).

Introduction

T-MODs are changes made to components or systems to implement temporary changes (typically <90 days) to facilitate testing, maintenance and operations during a contingency situation. These changes are meant to be temporary and shall not result in impacts to personnel safety or threats to the environment or damage to affected systems and equipment. This procedure defines the administrative controls and review and approval authorities for installing T-MODs under conditions that may involve, but are not limited to:

- Degrading the effectiveness of any system that is intended to prevent or mitigate injury to personnel or equipment damage.
- Disabling or changing the set point of any operational alarm or trip circuit function.
- Disabling of any indication circuit.
- Temporarily testing a system.
- Temporarily modifying a system to maintain operability.

The control of T-MODs in accordance with this procedure is necessary to ensure safe operations, minimize disruption while the T-MODs are in effect, and to assure orderly restoration of normal system or equipment status following their removal.

Any T-MODs associated with a High Hazard Operation or Accelerator that has an approved Safety Assessment Document (SAD), Safety Certificate (High Hazard Operation) or Accelerator Safety Envelope (ASE for an Accelerator) must be evaluated by the Unreviewed Safety Issue Determination (USID) process provided in ESH-025 before being implemented. Any positive USI for a High Hazard

Operation (non-Accelerator) shall be reviewed by the applicable Activity Certification Committee (ACC) for recommendation prior to any issuance of a T-MOD. Any positive USI for Accelerators requires DOE-PSO approval to implement the T-MOD.

Each T-MOD shall be conspicuously marked with a tag(s) which may be obtained from the Operating Authority as defined in *Definitions* and identified by a unique tag number which shall consist of abbreviating letters and the next sequential number.

If a particular procedure requires the installation and removal of a T-MOD, and the installation and removal are both specified in that procedure document, then the requirements of that procedure take precedence over this general administrative procedure.

Troubleshooting activities do not require T-MOD Tags, **if all of the following conditions are met:**

1. The person performing the troubleshooting does not leave the vicinity of the job site while the work is in process and until the job is completed.
2. The Operating Authority is informed when the troubleshooting begins, when it ends, and what the effect of the troubleshooting will be on current or planned system operations.
3. The person performing or supervising the work shall list all modifications made during the troubleshooting, and shall use the list as a checkoff to ensure that the system is fully restored after all changes are completed.

Reference Documents

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| DOE O 422.1 | Conduct of Operations |
| ES&HD-5008 | PPPL Environmental Safety and Health (ES&H) Manual |
| ENG-030 | PPPL Technical Procedures for Experimental Facilities |
| ESH-025 | Operations Hazard Classification Criteria and Safety Certification System |
| QAPD | PPPL QA Program Description |

Definitions

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| T-MOD | A planned, controlled, and temporary change in system configuration that will exist for a limited duration, normally not more than 90 days . |
| T-MOD Log | Hard copy or electronic T-MOD record maintained by the Operating Authority showing installation date, Cognizant Individual, location and affected systems and removal date. |
| Troubleshooting | The process of analyzing and isolating equipment malfunctions or failures of a particular component. |
| Operating Authority | Individual or position (designated by Project Manager or Department Head) responsible to coordinate operations, construction, radiological protection, maintenance/repair, installations, instrumentation and control, and security groups to safety accomplish operational objectives in |

assigned area. For example, on NSTX-U this may be the Shift Supervisor.

Procedure

A. Implementation of Temporary modifications

The PPPL institutional procedure for installing and managing T-MODs is as follows:

Responsibility

Action

Cognizant
Individual

1. Determines the need for any T-MODs to be made to systems and equipment and documents T-MODs on the T-MOD Form (see Attachment 1).

Confirms the equipment category, if missing has it established following ENG-057.

Makes the determination on the “Safety Effects” field (i.e. yes) on the T-MOD form if the T-MOD applies to any of the following types of equipment or systems:

- a. Hardwired interlocks of circuit breakers that are tripped as part of an E-stop system.
- b. Hardwired interlocks of a Personnel Access Control System.
- c. Safety disconnect switches.
- d. Safety lockout device.
- e. An Emergency Stop System.
- f. Any of the Kirk Key Interlock Systems.
- g. Fire Protection/Alarm Systems.
- h. Other situations deemed “personnel safety related” by the Cognizant Individual or Operating Authority.
- i. Any T-MODs associated with a High Hazard Operation or Accelerator that has an approved SAD, Safety Certificate (High Hazard Operation) or Accelerator Safety Envelope (ASE for an Accelerator) must be evaluated by the Unreviewed Safety Issue Determination (USID) process provided in ESH-025 before being implemented. Any positive USI for a High Hazard Operation (non-Accelerator) shall be reviewed by the applicable Activity Certification Committee (ACC) for recommendation prior to any issuance of a T-MOD. Any positive USI for Accelerators requires DOE-PSO approval to implement the T-MOD.

Environmental, Safety, and Health (ES&H) 2. Shall review and concur with T-MODs designated as having potential safety or environmental impacts, including planned actions for their

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| Manager or designee | elimination or mitigation. |
| Responsible Engineer | 3. Shall review and concur with T-MODs. |
| Operating Authority | 4. Shall review and concur with all T-MODs. Reviews and approves the technical implications of the requested T-MOD by signing and issuing the T-MOD tags. Enters the T-Mod information into T-MOD log. |
| Operating Authority (A3), or TA (A2), or Chief Engineer (A1) | 5. Approves the T-MOD as follows: <ul style="list-style-type: none"> • A-1: Chief Engineer • A-2: Technical Authority • A-3: Operating Authority |
| Operating Authority | 6. Signs and issues the T-MOD tags and enters T-MOD into T-MOD Log. |
| | 7. Coordinates the installation of T-MODs with other operations activities. |
| Cognizant Individual | 5. Briefs the individual(s) responsible for installing the T-MOD to assure that they understand the work. |
| | 6. Oversees proper T-MOD installation and tagging as noted below: <ul style="list-style-type: none"> • For a temporary modification that is accessible and visible, the T-MOD tag shall be affixed directly to the modification. • For temporary modifications that are not accessible and visible, the T-MOD tag shall be placed in a conspicuous location as near to the modification as possible or at multiple locations if the entire modification cannot be viewed from a single point. |
| | 7. Specifies on the T-MOD form or on a separate procedure, all special protection measures that may be required by the T-MOD during the tag-out period in accordance with ES&HD 5008, Section 2.6.4. |
| | 8. Ensures that T-MOD modifications are installed in accordance with T-MOD Mitigation Plan, if any (see T-MOD Form). |
| | 9. Removes or supervises T-MOD removal, and schedules, performs, and documents any or no testing required for system restoration after the T-MOD is removed. <ul style="list-style-type: none"> • Reviews the system configuration and ensures that the system |

operates in a safe fashion, and for the purpose for which it was designed.

- Non-compliance with approved operating configurations shall be brought to the immediate attention of the Cognizant Individual's supervisor and the Operating Authority for resolution.
- Closes out the T-MOD and returns the tags to the Shift Supervisor when outstanding non-compliances, if any, are resolved.

Cognizant
Individual

10. If necessary, requests an extension of the T-MOD by presenting a justification to the Operating Authority on why the T-MOD should remain.

Operating
Authority (A3),
or TA (A2), or
Chief Engineer (A1)

11. Approves (or denies) the extension request and updates the T-MOD database as appropriate. If approved, the Operating Authority reissues tags with the new extension date for installation in the field.

B. Maintenance of T-MOD Database

Operating
Authority

1. Maintains T-MOD Log.
2. Reviews the T-MOD log at least monthly to ensure that no T-MOD has expired. If the duration of a T-MOD approaches the expiration date (or exceeds it), request the Cognizant Individual to promptly disposition (i.e. remove or extend) the T-MOD.

C. Training (Section Required for All Procedures)

Head, Engineering 1. For Procedures changes

A. Target Audience: All COG, Project Managers and Responsible Engineers

Instructor: Head, Engineering

Training Method:

- ☒ Read only
☒ Email distribution only
☐ Briefing
☐ Classroom
☐ Online

Frequency:

- ☒ Once only

2. For new COGs, Project Managers and Responsible Engineers

A. Target Audience: All COGs and Project Managers

Instructor: Head, Engineering

Training Method:

☒ Classroom

Frequency:

☒ Annual

Head, Engineering

3. Notifies the Human Resources Training Office of the training so that they will be aware of the training requirements and be able to provide assistance and guidance in the course development, implementation, tracking, and maintenance.

Records Requirements Specific To This Procedure

Records Custodians must assure records are maintained as follows:

| Record Title | Record Custodian | Location | Retention Time |
|--------------|---------------------|--------------------|--|
| T-Mod Form | Operating Authority | Department Records | Destroy 5 yrs after form is superseded, or canceled. Reference Admin 16 Administrative Records (3.a) |
| T-Mod Log | Operating Authority | Department Records | Destroy 5 yrs after form is superseded, or canceled. Reference Admin 16 Administrative Records (3.a) |

Attachments:

Examples of T-MOD Database Form and T-MOD Tag

Examples of T-MOD Database Form and T-MOD Tag

T-MOD#:**FA -**

REQUESTOR _____ NUMBER OF TAGS _____

DATE OPENED _____ EXPIRATION DATE _____

ESH IMPACTS ☐ SAD AMENDMENT REQ'D ☐

TYPE OF T-MOD _____

LOCATION _____

CAT: ☐A1 ☐A2 ☐A3**OPEN/CLOSED****Description:****Reason/Permits Continued Operation:****Potential Impacts/Mitigation Plan and Testing After Removal:**

ESH Concurrence (if required) _____

Responsible Engineer Concurrence _____

Operating Authority Concurrence _____

T-MOD Approval _____

Examples of T-MOD Database Form and T-MOD Tag

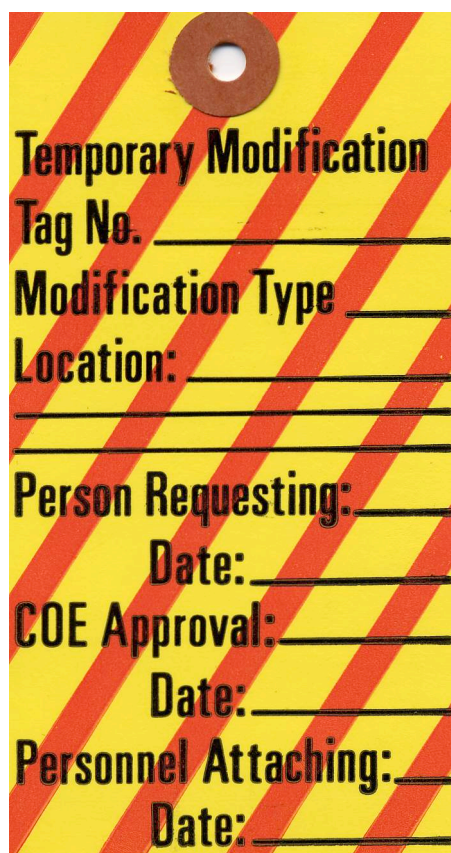
(A-1: CE, A-2: TA, A-3: Operating Authority)

*****Return tags to or contact Shift Supervisor to close T-MOD*****

Temporary Modification Tags

Each T-MOD shall be conspicuously marked with a tag(s) which may be obtained from the Shift Supervisor and identified by a unique tag number which shall consist of abbreviating letters and the next sequential number.

For a temporary modification that is accessible and visible, the T-MOD Tag shall be affixed directly to the modification. For temporary modifications that are not accessible and visible, the T-MOD Tag shall be placed in a conspicuous location as near to the modification as possible or at multiple locations if the entire modification cannot be viewed from a single point.

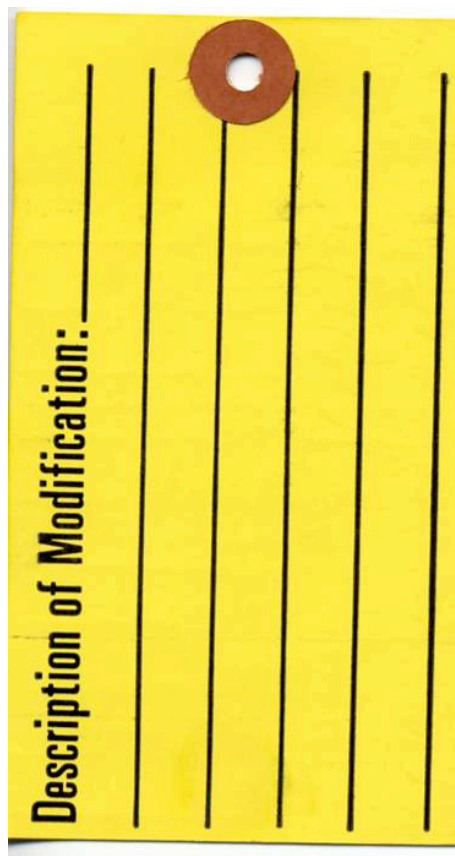


The front of the T-Mod Tag is yellow with red diagonal stripes. It features a hole punch at the top. The text on the tag is as follows:

Temporary Modification
Tag No. _____
Modification Type _____
Location: _____

Person Requesting: _____
Date: _____
COE Approval: _____
Date: _____
Personnel Attaching: _____
Date: _____

T-Mod Tag front



The back of the T-Mod Tag is yellow and features a hole punch at the top. It has a vertical line for writing the description of the modification.

Description of Modification: _____

T-Mod Tag back