

TCR NO. TCR-ENG-026,R2-001

TEMPORARY CHANGE REQUEST

The Temporary Change Request (TCR) Form is to be used to process urgent or minor changes for PPPL Policies, Organization/Mission Statements and Procedures. The TCR should be used when changes are:
1) urgent, and can not wait the 2-4 week period for Department Head review/comment, or
2) minor, and do not warrant Department Head review.

Person Requesting Change: R. Jeanes

Department Name: ES&H and IS Phone Ext: 2532

Document Number: ENG-026 Revision No.: 2

Document Title: Fire Detection and Suppression Systems

Reason for change:

1. To reflect changes in organizational structure.
2. To incorporate reference to Work Planning Procedures and to make this document consistent with them.

Change description: (Summarize and attach changed pages, with changes clearly indicated)

1. Page 2, Action 1: "Design Change Notice (DCN)" changed to "Engineering Change Notice (ECN)".
2. Page 2, Action 3 and 6: Combined into Action 3 and revised to make design review and documentation in accordance with ENG-032, "Work Planning Procedure" and ENG-033, "Design Verification". Reference added to procedure EFA-001, "Preparation, Review and Approval of M&O Procedures" and Attachment #1 is eliminated.
3. Page 3, Action 6: Responsibility for this action changed to "M&O Trade Supervisor".

1. Does this TCR significantly alter the intent or scope of the document? YES: _____ NO: X

2. Does this TCR significantly impact ES&H? YES: _____ NO: X

If 1 or 2 is YES, Explain why the changes should not be routed for Department Head review:

Carl Potensky
Department/Division Head Approval

7/3/01
Date

J.W. Anderson
Head, ES&H and Infrastructure Support/designee

7/5/01
Date

Release/Effective date of this TCR: 7/6/01

Incorporate this TCR into next revision of this document? Yes X No _____

PPPL	PRINCETON PLASMA PHYSICS LABORATORY	PROCEDURE	No. ENG-026 Rev 2 page 1 of 8
Subject: Fire Detection and Suppression Systems	Effective Date: April 16, 1999	Initiated by: Head, ES&H and Infrastructure Support	
	Supersedes: Rev. 1, dated 10/1/92	Approved: Director	

Applicability

This procedure applies to work performed by PPPL staff and subcontractors on fire systems at C and D sites. The term "fire systems" as used herein designates any equipment (smoke detectors, sprinkler systems, Halon systems, CO₂ systems, fire dampers, etc.) used to detect, contain, control or suppress a fire. It also applies to work activities that may affect fire systems such as welding, grinding and open flames. B Site fire detection and suppression systems are not included within this procedure because they are the responsibility of Princeton University, Main Campus. Fire extinguishers are also not included in this procedure.

Introduction

This procedure defines controls established to assure the functionality of fire systems. Reviews and approvals are imposed to assure that proposed additions, modifications, repairs and/or removals receive an appropriate technical evaluation and proper documentation to minimize the risk of impairing the existing system(s). Requirements are also specified for periodic testing, coordinating work and controlling impairments.

Reference Documents

NFPA	National Fire Protection Association Standards and Codes
DOE Order 420.1	Factory Mutual Data Sheets
DOE Order 440.1	Facility Safety
DOE Order 470.1	Worker Protection Management For DOE Federal And Contractor Employees
DOE Standard 1066	Safeguards and Security Program
ES&H 5008	Fire Protection Design Criteria
	Fire Safety (Section 5)
	M&O Division procedures pertaining to specific tasks for the inspection, test and repair of fire systems

Abbreviations

Some of the abbreviations used throughout this procedure are:

ESU	Emergency Services Unit of the Site Protection Division of ES&H and IS
ES&H	Environment, Safety and Health Division of ES&H and IS
ES&H and IS	Environment, Safety and Health and Infrastructure Support Department
FPE	Fire Protection Engineer
M&O	Maintenance and Operations Division of ES&H and IS
SPD	Site Protection Division of ES&H and IS
WO	Maintenance & Operations Division Work Order
Fire Systems	All Fire Detection, Fire Alarm and Fire Suppression Systems

Procedure**A. Configuration Control and Documentation of Fire Systems**

Both the design and the documentation for fire systems are under configuration control as specified herein. New systems will not be installed nor will existing systems be modified without the design review specified below.

Responsibility Action

- | | |
|---|---|
| M&O FPE | <ol style="list-style-type: none"> 1. Develops and maintains a list of controlled documents for fire systems. No revision, addition or deletion of these documents is allowed without review and authorization from the Maintenance & Operations Division (M&O) Fire Protection Engineer (FPE). The M&O FPE will be the designated approval authority for all Design Change Notices (DCNs) involving fire protection drawings and the "approver" for all changed fire protection system drawings. The latest drawings and revisions shall be maintained in the Engineering Department Central Drafting Files. 2. Assures fire detection and suppression system drawings and procedures are maintained current. |
| Cognizant System /
Project Engineer
(COG) | <ol style="list-style-type: none"> 3. Forwards specifications, drawings, procedures and any other documentation for proposed fire system installations or modifications to the appropriate reviewers. Design reviews and documentation will be conducted in accordance with ENG-032, Work Planning Procedure and ENG-033, Design Verification. <p style="margin-left: 20px;">Procedure writing and review will be conducted in accordance with EFA-001, "Preparation, Review and Approval of M&O Procedures". As a minimum, the review will include the M&O FPE, the Head of M&O and the Head, SPD. Additional reviewers may include representatives from other Divisions such as AC Power or the Computer Division as required by the nature of the work. The review may be conducted via a review meeting or via individual reviews depending on the scope of the work planned. The M&O FPE will normally determine how the review is to be conducted, except that a meeting will be held if requested by any of the above reviewers.</p> <p style="text-align: right; margin-right: 20px;">TCR-ENG-026,R2-001</p> |
| Reviewers | <ol style="list-style-type: none"> 4. Reviews work documentation and resolves comments with M&O cognizant engineer (COG). |
| M&O FPE | <ol style="list-style-type: none"> 5. Determines if any additional existing fire protection system documentation needs to be updated. |
| M&O COG | <ol style="list-style-type: none"> 6. Documents the completion of the reviews and the response to any comments using an ENG-026 Review Sheet. <p style="text-align: right; margin-right: 20px;">TCR-ENG-026,R2-001</p> 6.7. Updates design documents with as-built details and forwards to drafting. The as-built details may be shown manually or, in the case of work completed by subcontractors, revised drawings and/or disk files may be submitted to Central Drafting. |

B. Repair of Fire Systems

Repair of inoperative systems is the highest priority fire system work. M&O will assure that inoperative systems are repaired and returned to service as expeditiously as possible. When fire systems are impaired, but not inoperative, or when redundant systems exist, the FPE will provide guidance on the appropriate priority for the repair.

Responsibility Action

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|---|---|
| Initiator | 1. Identifies need to repair a fire system. Transmits information to M&O. |
| M&O Data Systems | 2. Generates WO, assigns work to appropriate trade or subcontractor, reviews for correctness and completeness, and forwards to M&O FPE for review. Also forwards information copies [normally by fax] to ES&H and ESU. |
| ES&H and SPD | 3. Review copy of WO upon receipt, and notify M&O FPE as soon as possible of any potential problems regarding the work to be performed. Documentation of this review is not required. |
| M&O FPE | 4. Provides guidance, as required, in deciding the proper response to the initiator's request. Reviews work order and attached documentation and provides additional information needed for task completion. In particular, the FPE will assure that proper procedures and testing are specified and that proper replacement parts are specified, if necessary. |
| M&O FPE | 5. Transmits WO to appropriate trade supervisor. Advises supervisor of the need for priority when a system is inoperative. Advises M&O Engineering Support of the need, specification and priority for replacement parts, if required. |
| M&O Trade Supervisor
M&O Engineering Support | 6. Orders and expedites parts and supplies, as required. |
| M&O Trade Supervisor | 7. Reviews WO for completeness and attaches procedures and other documentation as required by the FPE. Contacts FPE with questions or if additional documentation is needed. |
| M&O Trade Staff | 8. Completes work in accordance with WO package, any applicable system procedures and other sections of this procedure, in particular Paragraphs D and E on Coordination and Impairments, respectively. Documents completion of work and, in particular, testing accomplished and results. |
| M&O Manager | 9. Tracks WOs to assure timely and proper completion of fire system repairs.
10. Reviews completed work order to ascertain if any history should be entered into the Computerized Maintenance Database and if any information should be given to the FPE. |
| M&O Data Systems | 11. Enters data, as required, into the Computerized Maintenance Database and files work order documentation. |

C. Periodic Inspection and Testing (Preventive Maintenance) of Fire Systems

Preventive maintenance (PM) of fire systems is accomplished per NFPA requirements except that the scheduled frequencies may be adjusted as allowed by DOE guidance. Various organizations are responsible for completing fire system PMs including SPD, MG Section and M&O. The M&O Division, however, is responsible for scheduling and record keeping except that the records for the MG CO₂ systems, other than the PM cards, are kept by the MG section.

Responsibility**Action**

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| M&O FPE | 1. Determines testing and inspection requirements based on applicable codes and transmits to M&O Data Systems. |
| M&O Data Systems | 2. Enters requirements in the Preventive Maintenance Database.

3. Plans inspections and tests in accordance with the frequency requirements established by the FPE.

4. Distributes preventive maintenance cards and applicable procedures to individuals or groups responsible for testing, inspection or maintenance activities. For M&O PM items, issues a WO that is reviewed and accomplished in accordance with Section B of this procedure. |
| Personnel Assigned
PM Cards | 5. Performs actions required by preventive maintenance card, any applicable system procedures and other sections of this procedure, in particular Paragraphs D, E and F on Coordination, Impairments and Testing, respectively.

6. Informs ESU of any discrepancies noted which impair system operation.

7. Initiates work orders for items needing corrective action.

8. Returns signed cards to the M&O Data Systems. |
| M&O Data Systems | 9. Reviews completed work order to ascertain if any history should be entered into the Computerized Maintenance Database and if any information should be given to the FPE.

10. Enters data, as required, into the Computerized Maintenance Database and files work order documentation. |

D. Coordination of Work on Fire Systems**Responsibility****Action**

M&O Personnel or
Subcontractor in
charge of work

1. Coordinate D-Site work in accordance with Procedure EFF-023 and any applicable D-Site procedures.
2. Coordinates C-Site work with:
 - a. ESU Duty Fire Captain
 - b. ESU Communications Center.
3. When work activities may result in alarms, radio communication should normally be established with the ESU Communications Officer.

E. Impairment of Fire Systems

A fire system "impairment" is any condition that affects or could affect the ability of the system to fulfill its intended function. Because of the importance of fire systems, all impairments, whether intentional or due to equipment failure, must be tracked by ESU and the systems must be restored to full capability as expeditiously as possible. Except for impairments necessitated by Hot Work Permits, all impairments must be reviewed and approved in advance by the M&O FPE. For WOs this review is accomplished when the M&O FPE approves the WO. Hot Work Permits are covered by other applicable directives. The intentional impairment of systems will be done by ESU except that M&O personnel and their fire system subcontractors may impair systems for testing or repair when the concurrence of the ESU Captain is obtained.

Unplanned impairments may constitute a reportable occurrence. Therefore, they must be reported expeditiously so that a determination of reportability can be made.

Case 1, Discovery of an Unplanned Impairment**Responsibility****Action**

Discoverer

1. Reports discovery of impairment to ESU.

ESU

2. Logs impairment.
3. Requests correction of impairment by M&O. If the impairment is discovered by M&O personnel, the discoverer may assume the responsibility of the corrective action request; however, the ESU officer must specifically determine and document that the discoverer has assumed that responsibility.
4. Places impairment tag on affected system.
5. In conjunction with the M&O FPE, determines appropriate compensatory measures and implements them. (See also HSD 5008, Section 5)

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| SPD (ESU or Security) | 6. Evaluates report of malfunctioning fire detection and suppression system and, if possible, corrects deficiency within one hour of discovery. If deficiency exists more than one hour after discovery without permit, correction of the deficiency, or compensatory measures (roving fire watch, etc.), informs Facility Manager of deficiency in accordance with GEN-006. |
| ESU | 7. At conclusion of impairment, places system back in service, if applicable.
8. Removes impairment tag.
9. Logs conclusion of impairment. |

Case 2, Hot Flame Permits

Responsibility Action

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| Initiator | 1. Requests that hot flame permit be issued by calling ESU (3166), or the ESU Communication Center (2536), if ESU cannot be reached. |
| ESU | 2. Logs impairment(s) and estimated time at which the impairment will be cleared.
3. Issues hot flame permit in accordance with other directives for all open flame, grinding and welding activities once all applicable mandatory requirements have been met (hazardous activities curtailed, combustibles moved if possible, fire watch/patrol initiated, fire extinguishers in place, etc.).
4. Disables, when appropriate, fire alarm, fire detection and suppression system(s) based on hot flame permit requirements.
5. Places impairment tag on affected system(s). |
| Initiator | 6. Notifies ESU when work requiring Hot Flame Permit has been completed. |
| ESU | 7. Restores impaired system(s).
8. Removes impairment tag.
9. Logs conclusion of impairment.
10. If the estimated time passes without notification that the work is completed, contacts initiator to obtain a new estimated completion time or, if work is no longer in progress, restores the system(s) per steps 7 to 9 of this section. |

Case 3, Impairments for Maintenance or Testing

The M&O Person in Charge of Work may be an FPE, an Electrician for electrical systems or a Plumber for mechanical systems.

Responsibility**Action**

M&O Person in
Charge of Work

1. In addition to the coordination requirements of paragraph D, coordinate with ESU, specifically, the impairments to be made and the estimated time at which the impairment will be cleared.
2. Arranges to meet the firewatch requirements of other directives, if applicable.

ESU

3. Logs impairment(s) and estimated time at which the impairment will be cleared.
4. Verifies that firewatch requirements of other directives are met, if applicable.
5. Places impairment tag on affected system(s). EXCEPTION: For short duration impairments (8 hours or less) with a worker remaining at the impaired alarm panel or suppression system, tagging is at the ESU Captain's discretion. ESU responsibility to track the impairment is unchanged.

M&O Person in
Charge of Work

6. Notifies ESU when impairment(s) are cleared.

ESU

7. Logs impairment(s) cleared and removes tag, if applicable.
8. If the estimated time passes without notification that the impairment has been cleared, contacts M&O person in charge and obtains a new estimated time in service.
9. Uses recall list to reach an M&O manager if the M&O person in charge can not be contacted.

F. Testing Following Repairs or Modifications

M&O FPE

1. Establishes testing requirements.
2. Annotates WOs with the testing requirements. This may be done by designating an established functional test procedure or portion thereof or a special test procedure, as appropriate to the scope of the work being performed.
3. Provides requirements for specifications, statements of work, etc. for subcontract work.
4. Indicates when testing must be directed or witnessed by an FPE or by QC.

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|------------------------------|----|---|
| M&O FPE | 5. | Develops any test procedures needed to accomplish the requirements of step 2 of this section. |
| M&O Person in Charge of Work | 6. | Performs required testing. |
| | 7. | Documents testing completed. |

Attachments:

- ~~1. ENG-026 Project Review Sheet~~

NOTICE OF PLANNED INSTALLATION, MODIFICATION, OR DELETION OF FIRE PROTECTION SYSTEM(S)

Project Name: _____ Project No.: _____

DCA No. : _____

Cognizant Engineer: _____ Ext.: _____

SCOPE OF PLANNED ACTIVITY: (Attach Documentation, as required)

DELETED PER TCR-ENG-026,R2-001

REVIEWER'S SIGN-OFF:

I acknowledge having reviewed the subject project for configuration control requirements in accordance with Procedure No. ENG-026.

M&O Fire Protection Eng : _____ Date: _____

Head, Maintenance & Operations : _____ Date: _____

Head, Site Protection : _____ Date: _____

_____ Date: _____

_____ Date: _____

Reviewer's Comments