

**Appendix C-7**

**Fire Protection Inspector  
Technical Proficiency  
Training and Qualification Journal**

## Table of Contents

<b>Introduction</b> .....	2
<b>Required Training Courses:</b> .....	2
<b>Fire Protection Inspector Individual Study Activities</b> .....	3
(ISAFP-1) Deterministic Fire Protection Regulations .....	4
(ISAFP-2) Fire Modeling.....	6
(ISAFP-3) NFPA 805 Current Risk-Informed Regulations.....	8
(ISAFP-4) Mitigation Measures for Loss of a Large Area.....	10
<b>Fire Protection Inspector On-the-Job Activity</b> .....	12
(OJT-FP-1) Participate in Regional Fire Protection Inspection.....	13
<b>Fire Protection Inspector Technical Proficiency-Level Signature Card and Certification</b> .....	14
<b>Form 1: Fire Protection Inspector Technical Proficiency Level Equivalency Justification</b> .....	15
<b>Attachment 1: Revision History Sheet for IMC 1245 Appendix C7</b> .....	16

## Introduction

This appendix establishes the program for initial qualification of fire protection inspectors through formal training courses, individual study activities (ISAs), and on-the-job training (OJT).

In the future, one member of the inspection team for all fire protection triennial inspections will be required to be qualified to this standard. Before imposing this requirement, there will be a phase-in period to allow inspectors time to complete this training.

Individuals should be given credit for previous experience and training when completing the requirements outlined in this appendix. Section 05.02 of IMC1245 provides additional information on alternate methods for meeting a program requirement.

Appendix D-3 of Inspector Manual Chapter 1245 provides a list of additional courses and on-the-job training that inspectors may wish to consider in order to gain more skills in specific areas of fire protection.

### Required Training Courses:

1. Fire Protection for Power Plants (Nuclear Power Plant option)  
This is an external course, available through the Professional Loss Control Division of the Hartford Steam Boiler Inspection and Insurance Company. Details on the course and registration are available through the company's website (<http://www.hsbplc.com/FireProtectionCourses.aspx>).
2. IMC 0609 Appendix F Fire Protection Significance Determination Process (SDP) Training (available in iLearn as P-108)
3. Post Fire Safe Shut Down Analysis\*
4. Circuit Analysis\*

\*These two courses are currently under development. Until then, Module 1, "Probabilistic Risk Assessment" and Module 2, "Electrical Analysis" of the EPRI/NRC Fire Probabilistic Risk Assessment Course are considered to be suitable alternatives. The Chief of the Fire Protection Branch within NRR is available to be consulted on the acceptability of other alternatives for these two courses.

**Fire Protection Inspector Individual Study Activities**

## **Fire Protection Individual Study Activity**

- TOPIC:** (ISA-FP-1) Deterministic Fire Protection Regulations
- PURPOSE:** The purpose of this activity is to become familiar with the most important “deterministic” (non-risk-informed or “traditional”) fire protection regulations and the NRC generic communications that have been issued to help clarify regulatory expectations and positions on deterministic fire protection.
- COMPETENCY AREA:** TECHNICAL AREA EXPERTISE
- LEVEL OF EFFORT:** 24 hours
- REFERENCES:** Contact the chief of the Fire Protection Branch in NRR if you encounter difficulty locating references.
1. 10 CFR Part 50, Appendix A, General Design Criterion (GDC 3): “Fire Protection”
  2. 10 CFR 50.48, “Fire Protection”
  3. 10 CFR Part 50 Appendix R, “Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979”
  4. Branch Technical Position APCS 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants” May 1, 1976
  5. Appendix A to Branch Technical Position APCS 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants” August 23, 1976
  6. Branch Technical Position CMEB 9.5-1, “Guidelines for Fire Protection for Nuclear power Plants, Rev 3, July 1981
  7. NRC Memo Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance, June 20 1977, ML073120507
  8. NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, 9.5.1, Fire Protection Program”
  9. GL 86-10 “Implementation of Fire Protection Requirements” April 24, 1986
  10. RG 1.189, "Fire Protection for Nuclear Power Plants" Revision 1, March 2007
  11. SECY 08-0093, “Resolution of Issues Related to Fire-Induced Circuit Failures”
  12. The NRC’s Fire Protection website (<http://www.nrc.gov/about-nrc/fire-protection/related-info.html>)
- EVALUATION CRITERIA:** At the completion of this activity, you should have a clear understanding of the regulatory history of deterministic nuclear power plant fire protection as well as the relationship among the various key documents by which the NRC has clarified their deterministic

expectations and positions. Specifically, you should be able to do the following:

1. Describe the concept of defense-in-depth as it relates to fire protection.
2. Describe what a licensee's fire protection program must do.
3. Describe what a licensee's current licensing basis is.
4. Describe what "design basis" means with regard to a structure, system, or component of a facility.
5. Determine which Branch Technical Position/Regulation is used as a basis for a plant's Fire Protection Program.

**TASKS:**

The activities listed below shall be performed under the guidance of a subject matter expert.

1. Review the references and develop an understanding sufficient to meet the evaluation criteria.
2. Discuss the evaluation criteria with a subject matter expert.
3. Obtain a licensee's Final Safety Analyses Report and determine which Branch Technical Position/Regulation applies to the plants fire protection program.

**DOCUMENTATION:**

Fire Protection Inspector Technical Proficiency-Level Signature Card Item ISA-FP-1.

## **Fire Protection Individual Study Activity**

- TOPIC:** (ISA-FP-2) Fire Modeling
- PURPOSE:** The purpose of this activity is to become familiar with the fire modeling techniques used in Fire protection.
- COMPETENCY AREA:** TECHNICAL AREA EXPERTISE
- LEVEL OF EFFORT:** 40 hours
- REFERENCES:** Contact the chief of the Fire Protection Branch in NRR if you encounter difficulty locating references.
1. NUREG-1805, "Fire Dynamics Tools," December 2004 (includes CD with spreadsheets that should be exercised)
  2. NUREG-1824 (EPRI TR-1011999), "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications," January 2006
  3. NUREG/CR-6850 (EPRI TR-1011989), "FPRA Methodology for Nuclear Power Facilities," September 2005
- EVALUATION CRITERIA:** At the completion of this activity, you should have a clear understanding of the fire modeling techniques used in Fire protection. Specifically, you should be able to do the following:
1. Describe the difference between a Zone Model and a Field Model.
  2. Describe the general limitations of the five fire models described in NUREG-1824.
  3. Describe how a fire model can be used in a fire hazard analyses.
- TASKS:** The activities listed below shall be performed under the guidance of a subject matter expert.
1. Review the references and develop an understanding sufficient to meet the evaluation criteria.
  2. Discuss the evaluation criteria with a subject matter expert.
  3. Develop a scenario on your own, or use an example that is part of the fire model documentation, change the input parameters to see how these changes affect the output from the model. For example, changing the heat release rate of the fire, the geometry, or changing the ventilation from natural to forced ventilation.

**DOCUMENTATION:** Fire Protection Inspector Technical Proficiency-Level Signature Card  
Item ISA-FP-2.



## **Fire Protection Individual Study Activity**

**TOPIC:** (ISA-FP-3) NFPA 805 Current Risk-Informed Regulations

**PURPOSE:** The purpose of this activity is to become familiar with the risk-informed, performance-based regulation, NFPA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," that licensees must meet to demonstrate if adopting or maintaining a performance-based Fire Protection Program (FPP) under 10 CFR 50.48(c), "Fire Protection: National Fire Protection Association Standard NFPA 805."

**COMPETENCY AREA:** TECHNICAL AREA EXPERTISE

**LEVEL OF EFFORT:** 16 hours

**REFERENCES:** Contact the chief of the Fire Protection Branch in NRR if you encounter difficulty locating references.

1. 10 CFR 50.48(c), "Fire Protection: NFPA 805"
2. NFPA 805, 2001 Edition, "Performance-Based Standard for FP for Light Water Reactor Electric Generating Plants"
3. Reg Guide 1.205 "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants", May 2006
4. NEI 04-02 "Guidance for Implementing A Risk-informed, performance-based Fire Protection Program Under 10 CFR 50.48(c)", Revision 1, September 2005
5. NEI 00-01 "Guidance for Post Fire Safe Shutdown Analysis" Revision 1, January 2005

**EVALUATION CRITERIA:** At the completion of this activity, you should have a clear understanding of the NRC's role in evaluating the adequacy with which a licensee adopts and maintains compliance with 10 CFR §50.48(c) through adherence to NFPA 805.

**TASKS:** The activities listed below shall be performed under the guidance of a subject matter expert.

1. Review the references and develop an understanding sufficient to meet the evaluation criteria.
2. Discuss the evaluation criteria with a subject matter expert.
3. Outline the process by which a licensee converts their fire protection program from a traditional/deterministic program to one based on NFPA 805. Note: Additional insights into different fire protection programs can be gained by inspecting an NFPA 805 plant as well as a pre-1979 and post 1979 plant.

**DOCUMENTATION:** Fire Protection Inspector Technical Proficiency-Level Signature  
Card Item ISA-FP-3

## Fire Protection Individual Study Activity

**TOPIC:** (ISA-FP-4) Mitigation Measures for Loss of a Large Area

**PURPOSE:** The purpose of this activity is to become familiar with mitigation measures that licensees were required to develop and implement in response to the Section B.5.b of the Interim Countermeasures (ICM) Order EA-02-026 of February 25, 2002, subsequently imposed License Conditions, and 10 CFR 50.54(hh)(2).

**COMPETENCY AREA:** TECHNICAL AREA EXPERTISE

**LEVEL OF EFFORT:** 16 hours

**REFERENCES:** Contact the chief of the **Generic Communications** Branch (**NRR/DPR/PGCB**) to resolve **B.5.b issues** or if you encounter difficulty locating references.

1. 10 CFR 50.54(hh)(2), "License Conditions"
2. B.5.b inspections Community of Practice (CoP)
3. NEI 06-12 "B.5.b Phase 2 & 3 Submittal Guideline", Revision 2, December 2006, available on B.5.b inspections CoP (**ML070090060**)
4. Individual Licensee's B.5.b Safety Evaluation Report, available under "Licensee Specific Documents" on B.5.b inspections CoP
5. **IMC 0609, Appendix L, "B.5.b Significance Determination Process"**
6. **Temporary Instruction 2515/171, Rev. 1, "Verification of Site Specific Implementation of B.5.b Phase 2 & 3 Mitigating Strategies" (ML081340110)**
7. **IP 71111.05T, "Fire Protection (Triennial)"**
8. **IP 71111.05XT, "Fire Protection - NFPA 805 (Triennial)"**

### EVALUATION CRITERIA:

At the completion of this activity, you should have a clear understanding of the NRC's role in evaluating the adequacy with which a licensee adopts and maintains compliance with the requirements of Section B.5.b of the ICM Order, the subsequent License Conditions and 10 CFR §50.54(hh)(2).

**TASKS:** The activities listed below shall be performed under the guidance of a subject matter expert.

1. Be sure you are familiar with the requirements to properly handle security related information. If needed, consider taking the Information Security (INFOSEC) Awareness Training (see IMC 1245 Appendix A, ISA-25, Task 1) as a refresher.
2. Review the information in IMC 1245 Appendix A, ISA-2, Task 1.I. Under the NRC Web Applications link, locate the NRC Knowledge Center (NKC). Become a member of the B.5.b Inspection CoP so you can view the information there. Membership is required since many of

the documents and discussions on this site are Official Use Only – Security Related Information. After joining the CoP, review the posted documents and the past questions and answers.

3. Review the references and develop an understanding sufficient to meet the evaluation criteria.
4. Discuss the evaluation criteria with a subject matter expert.
5. Obtain a licensee's B.5.b submittals, Safety Evaluation Report, and TI 2515/171 Inspection Report and outline how the licensee's regulatory commitments were proposed and evaluated.
6. Discuss the basis for enforcement of License Conditions or 10 CFR 50.54(hh)(2) with a subject matter expert.

**DOCUMENTATION:** Fire Protection Inspector Technical Proficiency-Level Signature Card  
Item ISA-FP-4

**Fire Protection Inspector On-the-Job Activity**

## Fire Protection Inspector On-the-Job Activity

<b>TOPIC</b>	(OJT-FP-1) Participate in Regional Fire Protection Inspection
<b>PURPOSE</b>	The purpose of this activity is to acquaint you with the fire protection inspection process.
<b>COMPETENCY AREAS</b>	TECHNICAL AREA EXPERTISE
<b>LEVEL OF EFFORT</b>	40 hours
<b>ACTIVITY</b>	Accompany a team of regional Inspectors during a fire protection inspection
<b>EVALUATION CRITERIA</b>	<p>At the completion of this activity, you should understand the regional fire protection inspection process. Specifically, you should be able to do the following:</p> <ol style="list-style-type: none"><li>1. Discuss the objectives of the triennial fire protection Inspection.</li><li>2. Discuss the criteria used in choosing the fire areas or zones for inspection.</li><li>3. Discuss the regulatory requirements and licensing basis against which post fire safe shutdown capability is assessed.</li></ol>
<b>TASKS</b>	<p>The activities listed below shall be performed under the guidance of a subject matter expert.</p> <ol style="list-style-type: none"><li>1. Discuss the evaluation criteria with a subject matter expert.</li><li>2. Prior to the inspection obtain any documents the team leader deems necessary. See Section 71111.05-06 of the triennial inspection procedure.</li><li>3. Participate with the inspection team leader and the Regional SRA in the selection process of determining which fire areas or zones are to be inspected in this particular inspection.</li><li>4. Any other task given by the inspection team leader.</li></ol>
<b>DOCUMENTATION:</b>	Fire Protection Inspector Technical Proficiency-Level Signature Card Item OJT-FP-1.

**Fire Protection Inspector Technical Proficiency-Level  
Signature Card and Certification**

Inspector Name: _____	Employee Initials/ Date	Supervisor's Signature/ Date
<b>Training Courses for Fire Protection Inspector Qualification</b>		
Fire Protection for Power Plants		
MC 0609 Appendix F Fire Protection Significance Determination Process (SDP) Training (P-108)		
Circuit Analysis		
Post Fire Safe Shut Down Analysis		
<b>Individual Study Activities</b>		
ISA-1 Fire Protection Inspector: Deterministic Fire Protection Regulations/Generic Communications		
ISA-2 Fire Protection Inspector: Fire Modeling		
ISA-3 Fire Protection Inspector: NFPA805 Current Risk Informed Regulations		
(ISA-FP-4) Mitigation Measures for Loss of a Large Area		
<b>On-the-Job Training Activity</b>		
OJT-1 Fire protection Inspector: Participate in Regional Fire Protection Inspection		

Supervisor's signature indicates successful completion of all required courses and activities listed in this training standard.

Supervisor's Signature \_\_\_\_\_ Date: \_\_\_\_\_

**Form 1: Fire Protection Inspector Technical Proficiency  
Level Equivalency Justification**

<b>Inspector Name:</b> _____	<b>Identify equivalent training and experience for which the inspector is to be given credit</b>
<b>Training Courses for Fire Protection Inspector Qualification</b>	
Fire Protection for Power Plants	
MC 0609 Appendix F Fire Protection Significance Determination Process (SDP) Training (P-108)	
Circuit Analysis	
Post Fire Safe Shut Down Analysis	
<b>Individual Study Activities</b>	
ISA-1 Fire Protection Inspector: Deterministic Fire Protection Regulations/Generic Communications	
ISA-2 Fire Protection Inspector: Fire Hazards Analysis and Fire Modeling	
ISA-3 Fire Protection Inspector: NFPA805 Current Risk Informed Regulations	
(ISA-FP-4) Mitigation Measures for Loss of a Large Area	
<b>On-the-Job Training Activity</b>	
OJT-1 Fire protection Inspector: Participate in Regional Fire Protection Inspection	

Supervisor's Recommendation      Signature/Date \_\_\_\_\_

Division Director's Approval      Signature/Date \_\_\_\_\_

Copies to:    Inspector  
                  Human Resources Office  
                  Supervisor



Revision History Sheet for IMC 1245 Appendix C7  
Attachment 1

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment and Feedback Resolution Accession Number
N/A	07/08/09 CN 09-017	Initial issuance. Completed 4 year historical CN search	None	ML091590710
N/A	12/2911 CN 11-044 ML11105A143	This revision updates required training and adds a new ISA (ISA-4) to familiarize inspectors with mitigation measures that licensees were required to develop and implement in response to the Section B.5.b of the Interim Countermeasures Order EA-02-026 of February 25, 2002, subsequently imposed License Conditions, and 10 CFR 50.54(hh)(2).	None	ML11339A061
N/A	ML12251A068 12/19//12 CN-12-029	This revision corrects the point of contact for B.5.b issues and adds several references to ISA-4.	None	ML12290A180 Closed FF: 1245C7-1758