

NRC INSPECTION MANUAL

IOLB

MANUAL CHAPTER 1245, APPENDIX C7

FIRE PROTECTION INSPECTOR TECHNICAL PROFICIENCY TRAINING AND
QUALIFICATION JOURNAL

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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.

Individual **inspectors** 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.

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*

*This course material is currently under development. Until it is available, a suitable alternative is the completion of two modules from the EPRI/NRC Fire Probabilistic Risk Assessment Course, one of which must be attendance at or self-study of Module 2, "Electrical Analysis," (ML14226B017). The Chief of the Fire Protection Branch within NRR is available to be consulted on the acceptability of other alternatives for these two courses.

NOTE: Appendix D3, Fire Protection Advanced-Level Training 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.

Fire Protection (FP) Inspector Individual Study Activities (ISA)

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 regulations .
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. <ol style="list-style-type: none">10 CFR Part 50, Appendix A, General Design Criterion for Nuclear Power Plants, Criterion 3, “Fire protection”<ol style="list-style-type: none">10 CFR 50.48, “Fire protection”10 CFR Part 50 Appendix R, “Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979”Branch Technical Position (BTP Auxiliary and Power Conversion System Branch (APCSB) 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants” May 1, 1976, ADAMS Accession No. ML070660461Appendix A to BTP (APCSB) 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants” August 23, 1976, ADAMS Accession No. 070660458BTP Auxiliary System Branch (ASB), Guidelines for Fire Protection for Nuclear Power Plants,” Revision 1, ADAMS Accession No. ML070660450BTP Chemical Engineering Branch (CMEB) 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants, Revision 3, July 1981, ADAMS Accession No. ML070660454GL 77-02, “Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance, August 4, 1977, ADAMS Accession No. ML031280293NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition, Section 9.5.1.1, Fire Protection Program,” Revision 0, March 2009, ADAMS Accession No. ML090510170GL 86-10 “Implementation of Fire Protection Requirements” April 24, 1986, ADAMS Accession No. ML031150322

11. **Regulatory Guide 1.189, "Fire Protection for Nuclear Power Plants" Revision 2, October 2009 ADAMS Accession No. 092580550**
12. **Regulatory Guide 1.191, "Fire Protection Program for Nuclear Power Plants During Decommission and Permanent Shutdown, May 2001, ADAMS Accession No. ML011500010**
13. The NRC's Fire Protection website (<http://www.nrc.gov/about-nrc/fire-protection/related-info.html>)
14. **Attachment 71111.05AQ, Fire Protection (Annual/Quarterly)**
15. **Attachment 71111.05T, Fire Protection (Triennial)**

**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 **qualified Fire Protection Inspector (C-7)**.

1. Review the references and develop an understanding sufficient to meet the evaluation criteria.
2. Discuss the evaluation criteria with a **qualified Fire Protection Inspector (C-7)**.
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:	<p>Contact the chief of the Fire Protection Branch in NRR if an inspector encounters difficulty locating references.</p> <ol style="list-style-type: none">1. NUREG-1805, "Fire Dynamics Tools," December 2004 ADAMS Accession No. ML043290075 and NUREG-1805, Supplement 1, July 2013, ADAMS Accession Nos. ML13211A097 and ML13211A098.2. NUREG-1934 (EPRI 1023259), "Nuclear Power Plant Fire Modeling Analysis Guidelines (NPP FIRE MAG)," November 2012, ADAMS Accession No. ML12314A165
EVALUATION CRITERIA:	<p>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:</p> <ol style="list-style-type: none">1. Describe the difference between an algebraic, zone and a CFD or field model.2. Describe the general limitations of the five fire models described in NUREG-1934, Section 4.1.3. Describe how a fire model can be used in a fire hazard analyses.
TASKS:	<p>The activities listed below shall be performed under the guidance of a qualified Fire Protection Inspector (C-7).</p> <ol style="list-style-type: none">1. Review the references and develop an understanding sufficient to meet the evaluation criteria.2. Discuss the evaluation criteria with a qualified Fire Protection Inspector (C-7).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 **Fire Protection** Risk Informed, **Performance-Based** 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 **risk-informed** performance-based Fire Protection Program under 10 CFR 50.48(c), "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), "**National Fire Protection Association Standard NFPA 805**"
2. NFPA 805, 2001 Edition, "Performance-Based Standard for **Fire Protection** for Light Water Reactor Electric Generating Plants," **ADAMS Accession No. ML010800360**
3. NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition, Section 9.5.1.2, Risk-Informed (RI), Performance-Based (PB) Fire Protection Program," Revision 0, December 2009, **ADAMS Accession No. ML092590527**
4. Regulatory Guide 1.205 "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants", **Revision 2, December 2009, ADAMS Accession No. ML092730314**
5. NEI 04-02 "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)", Revision 2, April 2008, **ADAMS Accession No. ML081130188**
6. NEI 00-01 "Guidance for Post Fire Safe Shutdown Analysis" Revision 2, June 2009, **ADAMS Accession No. ML091770265**
7. Shearon Harris Nuclear Power Plant, Unit 1 - Issuance of Amendment Regarding Adoption of National Fire Protection Association Standard 805, Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating, ADAMS Accession No. ML101130535- Un-Redacted Version)
8. Attachment 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 10 CFR 50.48(c) through adherence to NFPA 805.

TASKS:

The activities listed below shall be performed under the guidance of a **qualified Fire Protection Inspector (C-7)**.

1. Review the references and develop an understanding sufficient to meet the evaluation criteria.
2. Discuss the evaluation criteria with a **qualified Fire Protection Inspector (C-7)**.
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 **qualified Fire Protection Inspector (C-7)**.

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 **qualified Fire Protection Inspector (C-7)**.
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 **qualified Fire Protection Inspector (C-7)**.

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

| Fire Protection Inspector On-the-Job (OJT) Activity

Fire Protection Inspector On-the-Job Activity

TOPIC:	(OJT-FP-1) Participate in Regional Fire Protection Inspection
PURPOSE:	The purpose of this activity is to acquaint you with the fire protection inspection process.
COMPETENCY AREAS:	TECHNICAL AREA EXPERTISE
LEVEL OF EFFORT:	40 hours
EVALUATION CRITERIA:	<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">1. Discuss the objectives of the triennial fire protection inspection.2. Discuss the criteria used in choosing the fire areas or zones for inspection.3. Discuss the regulatory requirements and licensing basis against which post fire safe shutdown capability is assessed.
TASKS:	<p>The activities listed below shall be performed under the guidance of a qualified Fire Protection Inspector (C-7) while accompanying a team of regional Inspectors during a fire protection inspection</p> <ol style="list-style-type: none">1. Discuss the evaluation criteria with a qualified Fire Protection Inspector (C-7).2. Prior to the inspection obtain any documents the team leader deems necessary. See Section 71111.05-06 of the triennial inspection procedure.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.4. Any other task given by the inspection team leader.
DOCUMENTATION:	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
Training Courses for Fire Protection Inspector Qualification		
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		
Individual Study Activities		
ISA-1 Fire Protection Inspector: Deterministic Fire Protection Regulations/Generic Communications		
ISA-2 Fire Protection Inspector: Fire Modeling		
ISA-3 Fire Protection Inspector: NFPA 805 Fire Protection Risk-Informed, Performance-Based Regulations		
ISA-FP-4 Mitigation Measures for Loss of a Large Area		
On-the-Job Training Activity		
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. **Additionally, the supervisor's signature below indicates the individual's readiness to appear before the Oral Board, if the individual has not previously completed an oral board.**

Supervisor's Signature _____ Date: _____

Form 1: Fire Protection Inspector Technical Proficiency
Level Equivalency Justification

Inspector Name: _____	Identify equivalent training and experience for which the inspector is to be given credit
Training Courses for Fire Protection Inspector Qualification	
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	
Individual Study Activities	
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: NFPA 805 Fire Protection Risk-Informed, Performance-Based Regulations	
(ISA-FP-4) Mitigation Measures for Loss of a Large Area	
On-the-Job Training Activity	
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

Attachment 1 - Revision History Sheet for IMC 1245 Appendix C7

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 (Pre-Decisional, Non-Public)
N/A	07/08/09 CN 09-017	Initial issuance. Completed 4 year historical CN search	None	ML091590710
N/A	12/29/11 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
N/A	ML15177A292 10/21/15 CN 15-020	This revision updates required training courses, references, and format; and clarifies that an oral qualification board is required, if not completed previously.	None	ML15195A178 Closed FF: 1245-1855 ML15054A211