**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>).

1. IMC 0609 Appendix F Fire Protection Significance Determination Process (SDP) Training (available in iLearn as P-108)
2. Post Fire Safe Shut Down Analysis\*
3. 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.

1. 10 CFR Part 50, Appendix A, General Design Criterion for Nuclear Power Plants, Criterion 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 (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. ML070660461
5. Appendix A to BTP (APCSB) 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants” August 23, 1976, ADAMS Accession No. 070660458
6. BTP Auxiliary System Branch (ASB), Guidelines for Fire Protection for Nuclear Power Plants,” Revision 1, ADAMS Accession No. ML070660450
7. BTP Chemical Engineering Branch (CMEB) 9.5-1, “Guidelines for Fire Protection for Nuclear Power Plants, Revision 3, July 1981, ADAMS Accession No. ML070660454
8. GL 77-02, “Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance, August 4, 1977, ADAMS Accession No. ML031280293
9. NUREG-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. ML090510170
10. GL 86-10 “Implementation of Fire Protection Requirements” April 24, 1986, ADAMS Accession No. ML031150322
11. Regulatry 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:Contact the chief of the Fire Protection Branch in NRR if an inspector encounters difficulty locating references.

1. NUREG-1805, “Fire Dynamics Tools," December 2004 ADAMS Accession No. [ML043290075](http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML043290075') and NUREG-1805, Supplement 1, July 2013, ADAMS Accession Nos. [ML13211A097](http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML13211A097') and [ML13211A098](http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML13211A098')).
2. NUREG-1934 (EPRI 1023259), “Nuclear Power Plant Fire Modeling Analysis Guidelines (NPP FIRE MAG),” November 2012, ADAMS Accession No. ML12314A165

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 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: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. 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

1. 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
2. NEI 00-01 “Guidance for Post Fire Safe Shutdown Analysis” Revision 2, June 2009, ADAMS [Accession No. ML091770265](http://pbadupws.nrc.gov/docs/ML0917/ML091770265.pdf)
3. 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)
4. 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)](http://nrcknowledgecenter.nrc.gov/CommunityBrowser.aspx?id=4380&lang=en-US)
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.l. 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.

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 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.
4. 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

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# 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:At the completion of this activity, you should understand the regional fire protection inspection process. Specifically, you should be able to do the following:

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**:** 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

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 | 12/2911  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 |
| 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 |