SFPE Job Description – Fire Service FPE

This job description lists the full range of possible duties that a fire protection engineer (FPE) can provide for a fire service organization. It is the organization’s responsibility to tailor the job description by first determining which duties to include, and then establishing the corresponding knowledge, abilities, qualifications, and certifications to adequately fulfill the FPE’s role within the organization. In this manner, organizations can match their needs with candidates’ capabilities.

Summary

Under general direction, performs responsible professional engineering review; inspection and investigative work in the specialized field of fire science, protection, and prevention; advises fire inspection personnel engaged in fire prevention work; assists operations personnel; and performs related duties as required.

Examples of Duties1

1. Review site, construction, sprinkler, standpipe, fire alarm, and all other system plans to ensure that they conform to the applicable regulations, standards, and codes. Evaluate and review sprinkler systems, fire main installations, detection and alarm systems, smoke control systems, and other fire protection components. Evaluate briefs submitted by engineers seeking approval for code equivalency.

2. Conduct fire safety and building code inspections of new and existing buildings as well as buildings under construction for code compliance. Inspections will include the testing of fire alarm and sprinkler systems, and all other system types.

3. Provide technical assistance and guidance to architects, engineers, developers, contractors, building owners, and various fire department personnel by providing a technical interpretation of building and fire codes as they apply to a jurisdiction.

4. Act as a technical resource for incident commanders by providing information concerning structural stability, hazardous materials, and fire protection components. Responsible for reactivation and reacceptance tests of fire alarm and sprinkler system.

1 This list demonstrates the full potential of a fire protection engineer. Modifications should be made based on the hiring organization.
5. Act as representative to various committees, technical associations, and professional organizations.
6. Present interests of jurisdiction at code modification/equivalency hearings. Assist in establishing code policies and guidelines.
7. Conduct hydrant flow tests and maintain water supply data.
8. Assist in the training of various fire department personnel with regards to fire science, fire protection components, and fire inspections. Provide presentations and training at various events concerning updates to codes and regulations.
9. Educate the public on fire safety techniques through presentations, demonstrations, and informational references.
10. Assist fire investigators. Duties may include cause and origin determination, reconstruction using fire modeling, system operation, system failure, and code compliance.
11. Assist in the pre-incident planning process. Act as a technical reference for building systems and department capabilities.

Knowledge and Abilities

Knowledge of:

- Fire protection engineering methods and practices
- Installed fire extinguishing and related safety systems
- Safety practices to be followed in structures where hazardous solids, liquids, or gases are to be manufactured, used or stored
- Firefighting equipment, its uses, capabilities, and limitations
- The local Building Code as it relates to fire protection
- National Fire Protection Association Standards
- Correct grammar, spelling, and syntax to write coherent reports and correspondence
- The principles of hydraulics related to water supply delivery
- Structural fire protection
- The nature and characteristics of fire and related hazards
- How fires originate, develop, and spread
- Fire prevention systems and practices
- Manual and automatic fire detection systems
- Fire control and suppression systems and practices
- The effects of fire and fire effluents on buildings, fire prevention and detection systems, and people
- The hazards and risks associated with fire

Ability to:

- Check and evaluate engineering construction documents including plans and specifications to ensure compliance with applicable codes, ordinances, and standards
- Evaluate smoke removal rational analysis reports to ensure compliance with applicable codes, ordinances, and standards

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2 These lists demonstrates the full potential of a fire protection engineer. Modifications should be made based on the duties expected to be performed.
• Evaluate sprinkler, fire suppression and fire alarm shop drawings and calculations to ensure compliance with applicable codes, ordinances, and standards
• Evaluate architectural plans to ensure compliance with applicable codes, ordinances, and standards
• Perform hydraulic water flow test and analyze the results of the test
• Work effectively with engineering and fire protection professionals
• Make critical decisions in stressful situations
• Communicate effectively with peers, supervisors, and members of the public from different cultures and backgrounds
• Make public presentations regarding fire protection, inspection, and investigation
• Write technical reports using correct grammar, spelling, and syntax
• Analyze and creatively resolve conflicts between code and operational and economic concerns
• Be tactful in dealings with higher authorities regardless of whether the authority is technically or organizationally higher
• Interpret federal, state, and local codes, ordinances, and standards pertaining to fire protection
• Work efficiently with minimal supervision to complete assigned tasks expeditiously
• Establish and maintain effective working relationships with other governmental agencies
• Identify fire hazards and risks in order to take corrective action
• Apply mathematical concepts such as probability and statistical inference, and fundamentals of plane and solid geometry and trigonometry
• Correctly document methods of mathematical modeling.

Education Qualifications

1. Possession of a baccalaureate degree in fire protection engineering from an Accreditation Board for Engineering and Technology (ABET) accredited college or university.

2. Possession of a baccalaureate degree in engineering from an ABET accredited college or university in, civil, mechanical, electrical, or related engineering plus additional years of documentable fire protection experience in addition to the minimum experience qualification below.

3. Possession of a baccalaureate degree in fire protection engineering technology.

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3 According to ABET, engineering programs often focus on theory and conceptual design, while engineering technology programs usually focus on application and implementation. Generally fire protection graduates from both programs are able to perform routine tasks such as plan review and inspections. A graduate from an engineering program may want to be considered for higher-level engineering tasks such as fire modeling and investigations.

4 Accreditation is optional. Accreditation is determined based on the standards set forth by the Accreditation Board for Engineering and Technology (ABET).

5 Fire protection is a specialized field of engineering that may limit the number of applicants.

6 Accreditation is optional. Accreditation is determined based on the standards set forth by the Accreditation Board for Engineering and Technology (ABET).

7 Providing an opportunity for engineers of different backgrounds can increase the amount of capable applicants beyond engineers in the fire protection discipline.
Experience Qualifications

1. _____Years of verifiable professional experience in the following areas of fire protection: [insert experience items that correspond to the duties selected from the list in the duties section]

2. _____Additional years of experience may substitute for the education qualification above.

Certifications Required or Desired

1. A registered P.E. in fire protection engineering as verified by examination administered by the National Council of Examiners for Engineering and Surveys (NCEES).9

2. A registered P.E. in a related engineering discipline as verified by examination administered by NCEES.

3. A registered P.E. in a related engineering discipline as verified by examination administered by NCEES plus _____additional years of experience in addition to the minimum experience qualification above.

4. Certification to National Institute for Certification in Engineering Technology NICET level ___ in the field(s) of [Water-Based System layout] [fire Alarm Systems] [Special Hazard Suppression Systems] [Inspection and testing of Water-based Systems]10

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8 In this section, the fire service organization selects experience commensurate with the duties desired, as well as additional experience that may substitute for education (if allowed).

9 The fire service organization shall determine professional certification based on local requirements or preferences. Professional Engineering licensure in the United States is generally issued on a state-by-state basis and permits an individual to practice engineering within that state. Since licensure is experience-based, the experience qualifications for this job description should be modified to coincide with the experience required by the licensing authority for a P.E. certification. International certifications include Professional Engineer –P.Eng. (Canada) and Chartered Engineer (U.K.), etc.

10 NICET certifications are generally intended for technicians performing design of specific systems. The fire service organization may want to consider this type of certification for officials performing corresponding types of shop drawing reviews, and if so, select the appropriate level.