

NEI Position Paper - Fire Brigade Drill Participation

Statement of Issue

During recent NRC triennial fire protection inspections in Region 1, NRC team members questioned the practice of providing credit for fire brigade drill participation to fire brigade members beyond the fire participants who don Personal Protective Equipment (PPE) and Self-Contained Breathing Apparatus (SCBA) or beyond the minimum 5 members that are required to respond.

Purpose

The purpose of this document is to provide an acceptable method of defining participation in fire brigade drills. This guidance is not intended to specifically identify all those activities that could potentially be considered acceptable for participation, rather to ensure that both the licensee and NRC understand there are activities associated with the drill (outside of being one of the five assigned members) that would qualify as participation.

Background and Description

Fire brigade drills at most nuclear power plants are conducted once per quarter for each operations shift. Most plants have committed to NRC guidance that each active fire brigade member must participate in at least two fire brigade drills each calendar year. Some licensees have adopted internal procedures that specifically define participation in fire brigade drills. An excerpt from a licensee's corporate procedure provides this definition as follows:

*"To be credited for participation in a fire drill, the primary and backup attack team members must don full protective clothing (e.g., turnout coat, helmet, gloves, hood, bunker pants, SCBA, PASS device, etc.). Members that are not part of the primary or backup attack teams must perform a job assignment. Job assignments include, but are **not** limited to, staging equipment, rescue, checking for fire extension, establishing ventilation, operating equipment, performing a re-flash watch and safe shutdown activities."*

While not all licensees may have a procedure as specific as the one noted above, many licensees extend drill participation beyond those specifically assigned fire brigade. A limited survey of the industry found that providing drill participation credit for fire brigade members that do not dress-out and use SCBA is a common practice (Attachment A).

Applicable NRC Guidance Documents

A review of NRC guidance documents was performed to determine if a clear definition of fire brigade drill participation exists. The review included NRC guidance documents applicable to the industry; however specific application of these documents may depend on the license date of specific plant license date.

- NRC Guidance Document
Branch Technical Position APCS 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976"
Industry Review: No definition for fire brigade drill participation is provided in this document. NFPA 27 is referenced as an applicable industry standard.
- NRC Guidance Document
"Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance"
Industry Review: This letter was provided to all licensees in 1979 to provide the NRC position on the areas addressed by the title. This document addresses fire brigades in Section 3 of the attachment. However, participation in fire brigade drills is not defined.
- NRC Guidance Document
10 CFR 50 Appendix R, Section III.I.3
Industry Review: Appendix R does not define what constitutes fire brigade drill participation. However, paragraph 3.b states, "Each fire brigade member should participate in each drill, but must participate in at least two drills per year."
- NRC Guidance Document
Standard Review Plan 9.5-1, "Fire Protection Program"
Industry Review: Revisions 2 and 3 were reviewed. Neither revision of these documents defines fire brigade drill participation.
- NRC Guidance Document
Regulatory Guide 1.189, "Fire Protection for Operating Nuclear Power Plants"
Industry Review: Section 3.5.1.4 addresses Performance Assessment/Drill Criteria. No definition for participation is provided.

In summary, these documents indicate that fire brigade drills should be conducted quarterly for each shift. They note that all fire brigade members should participate in each drill, but must participate in at least two per year. Requirements include the fire brigade practicing as a team and assessment of the fire brigade member's performance. However, criteria does not address what role a fire brigade member must play to receive credit for participation in a fire brigade drill.

Industry Consensus Documents

The NRC guidance documents identified above provide references to industry consensus standards that address industrial fire brigades. Early NRC documents reference NFPA 27, "Private Fire Brigades," as the source for additional information on fire brigade organization and training. Later NRC documents reference NFPA 600, "Standard for Industrial Fire Brigades." These two standards are essentially the same, but the number was changed by NFPA in 1986. NFPA 27 (1981 Edition) was reviewed, specifically Section 4-4 on fire brigade drills. Participation is not defined in this section or elsewhere in the document. The current 2005 Edition of NFPA 600 was also reviewed. Drills are addressed in section 4.3 of this document. The definition of drill participation is not provided here or elsewhere in the document.

Licensing Basis

Most licensees are committed to having each fire brigade member participate in at least two fire brigade drills per year. This commitment is typically captured in the fire protection program document required by 10 CFR 50.48. Specific commitments regarding fire brigade drill requirements and licensee strategy for compliance are documented in Fire Protection Safety Evaluation Reports.

Analysis

This section will consider why drill participation does not need to include donning SCBA and turnout gear to be acceptable to meet the NRC requirement for fire brigade member participation in at least two fire brigade drills per year. The key point is that it is not the purpose of the fire brigade drills to ensure that fire brigade members are proficient in the use of SCBAs and PPE. The annual training required by the NRC is intended to provide that function. Quarterly brigade drills are primarily focused on "practice", while annual live fire training is primarily focused on "qualification".

For example, the most current roll-up of NRC fire protection guidance is contained in Regulatory Guide 1.189, Rev. 1, Section 1.6.4.3, Fire Brigade Practice:

"The licensee should hold practice sessions for each shift fire brigade on the proper method of fighting the various types of fires that could occur in a nuclear power plant. These sessions should provide brigade members with experience in actual fire extinguishment and the use of self-contained breathing apparatuses under the strenuous conditions encountered in firefighting. The licensee should provide these practice sessions at least once per year for each fire brigade member."

The ability to demonstrate proficiency with protective clothing and breathing apparatus is important during the annual practice session since a high temperature, smoke filled environment is created (and this environment cannot be duplicated during drills at the plant). This is consistent with the NFPA consensus standard on fire brigades, which recognizes the importance of annual live fire training. Annual live fire training provided to industry fire brigade personnel typically includes a practical factors test in which each member must dress out and enter the hot zone to pass their annual qualification.

10 CFR 50 Appendix R (as well as other NRC documents) notes that all fire brigade members *should* participate in all drills on their shift (emphasis added). The practice of encouraging all fire brigade members to come to the drill scene, perform tasks supporting the drill evolution and participation at the critique session meets the intent of the Appendix R requirement. Each shift has a minimum of five designated fire brigade members. Additionally, there may be other fire brigade qualified individuals on each shift. Other available shift fire brigade members receive credit for the drill, if they perform some level of fire brigade drill support and attend the post-drill critique. This approach permits the fire brigade member to observe and participate in the drill and then to learn from the critique session based on first hand knowledge of the drill scenario.

The practice of providing drill credit to all participants (not just those who enter the "hot" zone) is consistent with other emergency response organizations. For example, hazardous material teams and confined space rescue teams require training on an annual basis. Re-qualification depends on participation in a drill. It is not expected that each member of these teams perform the key entry role for qualification. Each team member may perform support roles and still maintain qualification.

Similarly, Emergency Response Organization members are required to participate in emergency preparedness drills to maintain qualification, but the level of participation is not equal with all participants.

Fire brigade drill participation credit should to be given to a fire brigade member if the individual has not dressed-out but has met all of the following as captured in drill documentation:

- The fire brigade member understands the drill scenario. This can be accomplished by going to the drill scene (or command post) or by attending the critique session where the scenario and drill objectives are reviewed.
- The fire brigade member engages in a dynamic exercise that demonstrates some aspect of the skill set for a fire brigade member. This may include donning fire fighting PPE as part of the entry or backup team, it may also include other related activities such as; checking for fire extension, pulling fire hose or operating other fire fighting equipment, isolating fire affected plant equipment and set up of smoke removal/ventilation equipment.
- The fire brigade member attends and participates in the post-drill critique session. The critique session is where all aspects of the drill are reviewed and areas for improvement are identified.

Other Considerations

A survey of nuclear power plants found that approximately 75% of the respondents were providing credit to fire brigade members if the member participated in the drill and critique but did not dress-out (See survey results in Attachment A). Contact with the Nuclear Electric Insurance Limited (NEIL) Loss Control department was made to determine their observations of industry practice. NEIL standards require a Loss Control Representative to observe a fire brigade drill once per year at each site. NEIL confirmed that the standard industry practice is to provide fire drill credit for fire brigade members beyond those who dress-out.

Many licensees have more fire brigade members than can be included in the quarterly drill schedule (considering a limit of five drill participants). In addition, some licensees use various crafts to fill the fire brigade function (Operations, Security, Health Physics, Maintenance, etc.). The shift rotations between these various groups may be such that not all members are actually assigned one of the five fire brigade positions for the shift in which the drill occurs. Scheduling drills would be difficult to cover all possible permutations of fire brigade members, particularly without making all the drills "announced" (i.e. giving prior knowledge of the drill to the participants so that assignments could be rearranged).

Conclusion

The definition of fire brigade drill participation is not provided in NRC guidance documents or in industry consensus standards. Fire brigade drills provide an opportunity to assess the skill sets of fire brigade members. These skill sets go beyond donning PPE and SCBAs and include supporting fire brigade operations with pulling hose lines, isolating equipment, checking for fire extension and other related activities. Fire brigade drills provide fire brigade members an opportunity to understand the fire fighting strategies and fire hazards for specific plant areas. The critique sessions following the drill also provide a learning opportunity for all fire brigade members to share in areas for improvement and to re-enforce

good behaviors of all members involved. Individual licensees should develop a working definition of fire brigade drill participation and document that in plant procedures. This definition does not need to restrict participation to those individuals that actually “dress out” for the drill. It should include participation in the criteria discussed in the analysis section of this paper.

References

1. NRC Branch Technical Position APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants Docketed Prior to July 1, 1976"
2. NRC document "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance", 1979
3. 10 CFR 50 Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979"
4. NRC Standard Review Plan 9.5-1, "Fire Protection Program"
5. NRC Regulatory Guide 1.189, "Fire Protection for Operating Nuclear Power Plants"
6. NFPA 27, "Private Fire Brigades", 1981
7. NFPA 600, "Standard on Industrial Fire Brigades", 2005
8. 10 CFR 50.48, "Fire Protection"

Attachment A

Results of Industry Survey of Fire Brigade Drill Participation

PLANT*	Do extra Fire Brigade members who respond get credit for a drill if they participate but do not dress-out?
A	Yes
B	Yes
C	No
D	Yes
E	Yes
F	No
G	Yes
H**	No
I	Yes
J**	Yes
K	Yes
L	Yes
M**	No
N	Yes
O	No
P	Yes
Q	Yes
R	No
S	Yes
T	Yes
U	Yes
V	Yes
W	Yes
X	Yes
Y	Yes
Z	Yes

* Licensee identification intentionally withheld

** Plant has a dedicated fire department