

Attachment E, Nuclear Safety Capability Assessment Results by Fire Area

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Attachment E1, Deterministic Compliance with NFPA 805 Section 4.2.3

For each fire area where the licensee has selected the deterministic approach to demonstrate compliance, the staff has verified that the deterministic requirements of NFPA 805 Section 4.2.3 are met without the use of recovery actions. Fire areas that meet the deterministic requirements of NFPA 805 are “deemed to satisfy” the nuclear safety performance criteria as stated in NFPA 805 Section 4.1.

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Fire Area X-XX-X, FIRE AREA TITLE - Analysis Area X

The licensee stated that deterministic compliance has been met in accordance with NFPA 805 Section 4.2.3.2, which requires that one success path of required cables and equipment shall be located in a separate area having boundaries containing fire barriers with a minimum fire resistance rating of 3-hours. The licensee identified the SSCs necessary to meet the nuclear safety performance criteria in this fire area.

Based on the information provided in the LAR, the licensee did not identify any variations from the deterministic requirements nor did they credit any previously approved deviations from the deterministic guidance for this area.

OR

Based on the information provided in the LAR, the licensee did not identify any variations from the deterministic requirements. The licensee did, however, credit [insert number] previously approved deviations from the existing fire protection requirements. The licensee utilized the process described in [insert reference to docketed submittal material describing the transition process of previous approvals] which requires a determination of the basis of acceptability and a determination that the basis of the acceptability was still valid.

Deviation	Basis and Continuing Validity	Evaluation
<p><i>Describe the deviation.</i></p>	<p>Deviation was approved based on [insert the basis for approval of the deviation and the basis for the continued validity of the deviation].</p>	<p><i>Provide an evaluation of the licensee's basis for continued validity. Below are two examples.</i></p> <p>This deviation was re-evaluated for consideration in the RI/PB FPP. See discussion in Section 3.5.1 of this SE for details.</p> <p>Or</p> <p>Based on the previous staff approval of this deviation and the statement by the licensee that the basis remains valid, the staff finds this deviation acceptable.</p>

Evaluation of Fire Suppression Effects on Nuclear Safety Performance Criteria for Fire Area XX-XX

Describe the mitigation of damage caused by water from suppression activities. The following is sample language.

The licensee stated in *[insert reference to docketed submittal material]* that plant equipment subject to water damage is *[describe the protection and/or mitigating design features for the subject plant equipment]*. Damage to plant areas and equipment from the accumulation of water discharge from sprinkler system and hose lines is minimized by *[describe the drainage system for the area]*. Floor water surcharge is estimated to be insignificant. Therefore, fire suppression activities will not adversely affect achievement of the nuclear safety performance criteria.

Based on the information provided by the licensee in the NFPA 805 LAR, the staff finds the licensee's evaluation of fire suppression effects on NSPC acceptable because the results of the licensee's analysis indicate that fire suppression activities will not adversely affect achievement of the nuclear safety performance criteria.

The licensee performed an evaluation of the fire detection and suppression systems in this area. The results of the evaluation were documented in *[insert reference to docketed submittal material]*. The applicable portions of Tables 4-8-1 and 4-8-2 have been included below.

If needed, describe any pertinent RAI responses that address a technical issue raised by the reviewer. "Pertinent in this case means an RAI response that provided information necessary for the conclusion in the SE that was not provided in the submittal itself. Include a reference to the RAI response. Briefly describe the technical issue in the RAI, the licensee response, and the reviewer's evaluation of the response.

Fire Area	Fire Zone	Zone Description	Auto Suppression Provided?	Suppression Required System?					Detection Provided?	Detection Required System?				
				S	D	E	R	C		S	D	E	R	C
XX-XX	X-XX-X	Insert Zone Description	Yes/No	Y/N	Y/N	Y/N	Y/N	Y/N	Yes/No	Y/N	Y/N	Y/N	Y/N	Y/N

Legend:

S - Abbreviation for Separation: Systems required for Chapter 4 Separation Criteria
 D - Abbreviation for Deviation: Systems required for NRC approved Exemptions/Deviations
 E - Abbreviation for EEEE: Systems required for acceptability of existing compliance strategies in Engineering Equivalency Evaluations
 R - Abbreviation for Risk: Systems determined to be of 'higher significance' by NFPA 805 Expert Panel
 C - Change Evaluation: Systems required to maintain adequate balance of Defense-in-Depth in a Change Evaluation

Fire Area X-XX-X Conclusion

Based on:

1. The licensee's documented compliance to NFPA 805 Section 4.2.3.2, and assertion that the success path will be free of fire damage without reliance on recovery actions,
2. The assessment of the impact of suppression systems on the ability to meet the nuclear safety performance criteria and;
3. The licensee's determination of the suppression and detection systems required to meet the nuclear safety performance criteria,

Fire Area X-XX-X meets the deterministic requirements of NFPA 805 Section 4.2.3.2.

Attachment E2, Performance-Based Compliance with NFPA 805 Section 4.2.4

For each fire area where the licensee has selected fire risk evaluation as the PB approach, the staff verified that the change in risk is appropriately defined, the magnitude is acceptable (see Section 3.4.3 of this SE), and DID and sufficient safety margins are maintained (see Section 3.4.2 of this SE). The staff has also verified that the additional risk of RAs is acceptable (see Section 3.4.4 of this SE).

The licensee included the assessment of DID and SM in the fire safety analysis (FSA) for each of the areas addressed using the performance-based approach. Each fire risk evaluation assessed most aspects of DID, including: Passive fire protection features (fire barriers, through penetration fire stops, penetration seals, radiant energy shields. Etc.), active fire protection features (doors and dampers) and programmatic controls (combustible controls, hot work, design – flame spread of surfaces, electrical design, etc.), including manual suppression using fire extinguishers and hoses.

The licensee addressed the remaining DID attributes (fire suppression, fire detection and ERFBS) separately. ERFBS were treated as VFDRs and the risk and associated DID attributes were assessed in the fire risk evaluation for each fire area where ERFBS was utilized. The licensee evaluated suppression and detection using a process that looked at several key aspects of the fire protection program to determine if a given system is required or not (deterministically in support of compliance to NFPA 805 Chapter 4, in support of a previous staff approved deviation, in support of a licensee-developed engineering equivalency evaluation, or as a result of the performance-based evaluations).

Each of the fire areas below include a section discussing those fire suppression and fire detection systems the licensee has determined to be required to meet the nuclear safety performance criteria.

Performance-Based Compliance with NFPA 805 Section 4.2.4

Fire Area XX-XXX, FIRE AREA TITLE

The licensee analyzed this fire area using the fire risk evaluation approach but also used deterministic simplifying assumptions in order to credit those portions of the facility design that met the deterministic requirements as permitted by NFPA 805, section 4.2.2. The licensee identified the SSCs necessary to meet the nuclear safety performance criteria in this fire area.

Evaluation of Fire Suppression Effects on Nuclear Safety Performance Criteria for Fire Area XX-XXX

Describe the mitigation of damage caused by water from suppression activities. The following is sample language.

The licensee stated in *[insert reference to docketed submittal material]* that plant equipment subject to water damage is *[describe the protection and/or mitigating design features for the subject plant equipment]*. Damage to plant areas and equipment from the accumulation of water discharge from sprinkler system and hose lines is minimized by *[describe the drainage system for the area]*. Floor water surcharge is estimated to be insignificant. Therefore, fire suppression activities will not adversely affect achievement of the nuclear safety performance criteria.

Based on the information provided by the licensee in the NFPA 805 LAR, the staff finds the licensee’s evaluation of fire suppression effects on NSPC acceptable because the results of the licensee’s analysis indicate that fire suppression activities will not adversely affect achievement of the nuclear safety performance criteria.

Fire Area XX-XXX Deviations

The licensee credited *[insert number]* previously approved deviations from the existing fire protection requirements. The licensee utilized the process described in *[insert reference to docketed submittal material describing the transition process of previous approvals]* which requires a description of the basis of acceptability and a determination that the basis of the acceptability was still valid.

Deviation	Basis and Continuing Validity	Evaluation
<i>Describe the deviation.</i>	Deviation was approved based on <i>[insert the basis for approval of the deviation and the basis for the continued validity of the deviation]</i> .	Based on the previous staff approval of this deviation and the statement by the licensee that the basis remains valid, the staff finds this deviation acceptable.

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Performance-Based Compliance with NFPA 805 Section 4.2.4

Variations from Deterministic Requirements (VFDRs)

Licensee's Open Item #	Fire Area	VFDR Description	Component (Cables)	Disposition	Evaluation
XXX	XX-XXX	Describe the VFDR.	List the associate cables XXXXX-X	Describe basis provided by the licensee for why the VFDR is not safety significant (i.e. Not within ZOI of a significant ignition source) and/or Describe any modifications to which the licensee committed.	Based on [insert technical evaluation], the staff finds this acceptable.

Recovery Actions (RAs)

There were no Recovery Actions identified for this fire area.

OR

Component ID	Component Name	Description of Action
X-XXX	Example: Valve B123	Describe the action and the intended result of the action. For example: D-energize channel 123 at MCC panel A, Cabinet 2 in fire zone ABCD to fail the valves closed.

The fire risk evaluation for this fire area determined that the additional risk of this fire area, compared to deterministic compliance, is X.XXE-X (Δ CDF) and X.XXE-X (Δ LERF). See sections 3.4.3 and 3.4.4 of this safety evaluation for a detailed discussion of the staff's review of the Fire Risk Evaluations.

Attachment E, Nuclear Safety Capability Assessment Results by Fire Area

Performance-Based Compliance with NFPA 805 Section 4.2.4

Fire Detection & Suppression Systems Required to Meet the Nuclear Safety Performance Criteria

The licensee performed an evaluation of the fire detection and suppression systems in this area. The results of the evaluation were documented in *[insert reference to docketed submittal material]*. The applicable portions of the information submitted by the licensee are included below.

If needed, describe any pertinent RAI responses that address a technical issue raised by the reviewer. "Pertinent in this case means an RAI response that provided information necessary for the conclusion in the SE that was not provided in the submittal itself. Include a reference to the RAI response. Briefly describe the technical issue in the RAI, the licensee response, and the reviewer's evaluation of the response.

Fire Area	Fire Zone	Zone Description	Auto Suppression Provided?	Suppression Required System?						Detection Provided?	Detection Required System?					
				S	D	E	EC	R	C		S	D	E	EC	R	C
XX-XXX	XX-XX	Example: Switchgear room Elev. 5 ft.	Yes/No	Y/N	Y/N	Y/N	Change ID	Y/N	Y/N	Y/N	Y/N	Y/N	Y/N	Change ID	Y/N	Y/N

Legend:

S - Abbreviation for Separation: Systems required for Chapter 4 Separation Criteria
 D - Abbreviation for Deviation: Systems required for NRC approved Exemptions/Deviations
 E - Abbreviation for EEEE: Systems required for acceptability of existing compliance strategies in Engineering Equivalency Evaluations (Left column documents if required, right column documents the engineering change [EC](s))
 R - Abbreviation for Risk: Systems determined to be of 'higher significance' by NFPA 805 Expert Panel
 C - Change Evaluation: Systems required to maintain adequate balance of Defense-in-Depth in Change Evaluation
 I - Ionization
 T - Thermal

Performance-Based Compliance with NFPA 805 Section 4.2.4

Fire Area XX-XXX Conclusion

Based on:

1. The licensee's documented fire risk evaluation of this fire area for all VFDRs and success path recovery actions;
2. The staff's comparison of the fire risk evaluation results as documented in Section 3.4.2 and 3.4.3 of this safety evaluation;
3. The assessment of the impact of suppression systems on the ability to meet the nuclear safety performance criteria; and,
4. The licensee's determination of the suppression and detection systems required to meet the nuclear safety performance criteria;

Fire Area XX-XXX meets the performance-based requirements of NFPA 805 Section 4.2.4.2.