

**L. NFPA 805 Chapter 3 Requirements for Approval  
(10 CFR 50.48(c)(2)(vii))**

6 Pages Attached

## Approval Request 1

In accordance with 10 CFR 50.48(c)(2)(vii) "Performance-based methods," the fire protection program elements and minimum design requirements of Chapter 3 may be subject to the performance-based methods permitted elsewhere in the standard.

In accordance with NFPA 805 Section 2.2.8, the performance-based approach to satisfy the nuclear safety, radiation release, life safety, and property damage/business interruption performance criteria requires engineering analyses to evaluate whether the performance criteria are satisfied.

In accordance with 10 CFR 50.48(c)(2)(vii), the engineering analysis performed shall determine that the performance-based approach utilized to evaluate a variance from the requirements of NFPA 805 Chapter 3:

- (A) Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;
- (B) Maintains safety margins; and
- (C) Maintains fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire nuclear safety capability).

Ameren Missouri requests formal approval of performance based exceptions requirements in Chapter 3 of NFPA 805 as follows:

### NFPA 805, Section 3.5.16

NFPA 805, Section 3.5.16 states:

*"The fire protection (FP) water supply system shall be dedicated for fire protection use only.*

*Exception No. 1: Fire protection water supply systems shall be permitted to be used to provide backup to nuclear safety systems, provided the fire protection water supply systems are designed and maintained to deliver the combined fire and nuclear safety flow demands for the duration specified by the applicable analysis.*

*Exception No. 2: Fire protection water storage can be provided by plant systems serving other functions, provided the storage has a dedicated capacity capable of providing the maximum fire protection demand for the specified duration as determined in this section."*

Contrary to the requirements of NFPA 805 Section 3.5.16, the Shift Manager/Control Room Supervisor (CRS) may approve use of fire protection system water for plant evolutions other than fire protection under the following conditions:

- Shift Manager/CRS approval is obtained and documented.
- Controls/communications are in place to ensure the non-fire protection system water demand can be secured immediately if a fire occurs.
- The non-fire protection system water demand must be less than 250 gpm.

**Basis for Request:**

The use of the fire protection water for these non-fire protection system water demands would have no adverse impact on the ability of the fire protection system to provide required flow and pressure, based on the following facts:

- The 250 gpm limitation is less than the hose stream postulated in determining fire suppression water flow requirements (a minimum of 500 gpm); therefore, there is no adverse impact on the flow and pressure available to any automatic water based suppression systems.
- Personnel utilizing the fire protection water are in contact with the Control Room therefore ensuring the ability to secure the non-fire protection system water demand should a fire occur. Therefore, flow will be available for the manual fire suppression demands when needed.

**Nuclear Safety and Radiological Release Performance Criteria:**

The use of fire protection water for non-FP plant evolutions is an occurrence requiring Shift Manager/CRS review and concurrence. The flow limitations ensure that there is no impact on the ability of the automatic suppression systems to perform their functions. The ability to isolate the non-fire protection flows ensures there is no impact on manual fire suppression efforts. Therefore, there is no impact on the nuclear safety performance criteria.

The use of fire protection water for plant evolutions other than fire protection has no impact on the radiological release performance criteria. The radiological release performance criteria are satisfied based on the determination of limiting radioactive release (Attachment E), which is not affected by impacts on the fire protection system due to use of fire protection water for non-fire protection purposes.

**Safety Margin and Defense-in-Depth:**

The use of the fire water system, including the use of hydrants and hose, for non-fire protection uses does not impact fire protection defense-in-depth. The fire pumps have the excess capacity to supply the demands of the fire protection system in addition to the non-fire protection uses as identified above. This does not result in compromising automatic or manual fire suppression functions, fire suppression for systems and structures, or the nuclear safety capability assessment. Since both the automatic and manual fire suppression functions are maintained, defense-in-depth is maintained.

The methods, input parameters, and acceptance criteria used in this analysis were reviewed against those used for NFPA 805 Chapter 3 acceptance. The methods, input parameters, and acceptance criteria used to calculate flow requirements for the automatic and manual suppression systems were not altered. Therefore, the safety margin inherent in the analysis for the fire event has been preserved.

**Conclusion:**

NRC approval is requested for approval of the temporary use of the fire protection water supply with the following restrictions:

- Shift manager/CRS approval is obtained and documented;
- Controls/communications are in place to ensure the non-fire protection water demand can be secured immediately if a fire occurs;

- The non-fire protection system water demand must be less than 250 gpm.

The engineering analysis determined that the performance-based approach utilized to evaluate a variance from the requirements of NFPA 805 Chapter 3:

- (A) Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;
- (B) Maintains safety margins; and
- (C) Maintains fire protection defense-in-depth (fire prevention, fire detection, fire suppression, mitigation, and post-fire nuclear safety capability).

## Approval Request 2

### NFPA 805 Section 3.3.5.1

NFPA 805 Section 3.3.5.1 states:

*“Wiring above suspended ceilings shall be kept to a minimum. Where installed, electrical wiring shall be listed for plenum use, routed in armored cable, routed in metallic conduit, or routed in cable trays with solid metal top and bottom covers.”*

An inspection of the spaces above the suspended ceiling in the following areas was conducted. The inspection revealed the existence of limited quantities of wiring (cables) which do not meet the criteria of NFPA 805 Section 3.3.5.1.

#### Fire Area TB-1

Fire Zones 4317, 4323, Chemistry Cold Lab

Fire Zone 4505, Turbine Deck Offices

Fire Zone 3611, Access Corridor

Fire Zone 3612, Operations Field Office

Fire Zones 3613, 3613A, 3613B, Operations Misc Areas

Fire Zone 3614, Access Corridor

Fire Zone 3225, Access Corridor

Fire Zones 3226, 3227, 3228, Hot Lab Areas

#### Fire Area RW-1

Fire Zone 7209, Radwaste Control Room

Fire Zone 7211, Radwaste Lab

(Note that wiring also exists above the suspended ceilings in the Control Room, Control Room Foyer, and Shift Manager’s Office (Fire Area C-27); and above the ceilings in all zones in Fire Areas C-5 and C-6. The fire protection for the area above the ceilings in these areas was approved in NUREG-0830 as discussed in Section 3.3.5.1 of Attachment A; therefore, these areas are not discussed further in this approval request).

Compliance with NFPA 805 Section 3.3.5.1 requires the cables either be plenum rated or in metallic conduit, armored cable or covered tray. The inspections performed revealed that each area currently has a limited amount of cabling which does not meet the criteria of NFPA 805 Section 3.3.5.1.

Nearly all cables that are exposed are communication cables associated with computers, telephones, televisions, or projectors that are located within the fire zone. There are no exposed power cables (480 VAC or larger). The majority of exposed cables meet one of the acceptable cable qualifications listed within FAQ 06-0022 Rev. 3.

### Basis for Request:

The basis for the approval request of this deviation is:

- Only a limited amount of the cable installed above the suspended ceilings in these areas is not rated for plenum use or wrapped in conduit.

- The cable is low voltage (less than 480V) and therefore less susceptible to self ignition and electrical shorts that could result in a fire in the enclosed space.
- There are no additional ignition sources in the listed areas above the suspended ceilings.
- For the cables that do meet the NFPA 805 section 3.3.5.1 criteria, the majority meet one of the cable qualifications listed within FAQ 06-0022 Rev.3.
- Plant procedures will be revised to ensure future exposed cables installed above the suspended ceilings meet one of the cable qualifications found acceptable in FAQ 06-0022 Rev.3.

**Acceptance Criteria Evaluation:****Nuclear Safety and Radiological Release Performance Criteria:**

The presence of non-rated plenum cables above the identified suspended ceiling locations does not adversely affect the nuclear safety capability. The quantities of non-rated plenum cable which do not meet NFPA 805 code required metal conduit, armored cable, or enclosed metal cable trays, are limited. In addition, there are no additional ignition sources above the suspended ceilings. There is no adverse impact on the nuclear safety performance criteria due to the non-rated plenum cabling in these areas.

The location of non-rated plenum wiring above suspended ceilings also has no impact on the radiological release performance criteria. The radiological review was performed based on the potential location of radiological concerns and is not dependent on the type of wiring or locations of suspended ceilings. Of the areas applicable to this request, only the following are located in a radiological controlled area: Radwaste Control Room, Radwaste Lab, Hot Lab, Counting Room, and Vestibule #3.

**Safety Margin and Defense-in-Depth:**

The quantity of non-rated plenum cables above the identified suspended ceiling locations is not significant. The safety margin inherent in the analysis for the fire event has been preserved.

The introduction of the non-plenum rated cable routed above the suspended ceilings does not impact fire protection defense-in-depth. Such cabling does not compromise automatic or manual fire suppression functions, fire suppression for systems and structures, or the nuclear safety capability assessment.

**Conclusion:**

NRC approval is requested to approve the presence of cable located above the suspended ceilings located in the fire area/zones listed below which do not meet the requirements of NFPA 805 section 3.3.5.1. The cabling is not in metal conduit, it is not armored cable, it is not enclosed in metal cable trays and it is not plenum rated cable.

**Fire Area TB-1**

- Fire Zones 4317, 4323, Chemistry Cold Lab
- Fire Zone 4505, Turbine Deck Offices
- Fire Zone 3611, Access Corridor
- Fire Zone 3612, Operations Field Office
- Fire Zones 3613, 3613A, 3613B, Operations Misc Areas

Fire Zone 3614, Access Corridor

Fire Zone 3225, Access Corridor

Fire Zones 3226, 3227, 3228, Hot Lab Areas

Fire Area RW-1

Fire Zone 7209, Radwaste Control Room

Fire Zone 7211, Radwaste Lab