

FAQ 14-0073 – Acceptable Uses of Fuel Fired Equipment

The staff has the following questions and observations about the above captioned FAQ.

- 1) The FAQ does not address NFPA 805 3.3.1.3.2, “(O)ther possible sources of ignition shall be restricted to properly designated and supervised safe areas of the plant.” Fuel fired equipment involves hot surfaces that are possible sources of ignition, yet FAQ 14-0073, does not include a discussion of restricting such equipment to designated and supervised safe areas of the plant.

Response:

NFPA 805-2001, Section 3.3.1.3.2, Smoking and other possible sources of ignition shall be restricted to properly designated and supervised safe areas of the plant.

Section 3.3.1.3.2 is addressed within License Amendment Request Attachment A - NEI 04-02 Table B-1 Transition of Fundamental FP Program & Design Elements which is reviewed and approved. The approved fire protection program includes the compliance basis described within Table B-1 and the fire protection program controls identified in the compliance basis are generically applied. Therefore this was not considered a point of confusion requiring clarification in the FAQ.

- 2) The FAQ does not address NFPA 805 3.3(1), “Prevention of fires and fire spread by control on operational activities.” Fuel fired equipment has the potential to cause fires, and liquid combustibles have the potential for fire spread if not contained. Combustible liquids are typically contained by an enclosure (tank), a dike if the enclosure leaks, and typically a fire suppression system is installed. The FAQ does not discuss how the fire prevention is considered with the use of fuel fired equipment.

Response:

NFPA 805-2001, 3.3 Prevention, A fire prevention program with the goal of preventing a fire from starting shall be established, documented, and implemented as part of the fire protection program. The two basic components of the fire prevention program shall consist of both of the following:

- (1) Prevention of fires and fire spread by controls on operational activities
- (2) Design controls that restrict the use of combustible materials

The design control requirements listed in the remainder of this section shall be provided as described.

Section 3.3 is addressed within License Amendment Request Attachment A - NEI 04-02 Table B-1 Transition of Fundamental FP Program & Design Elements which is reviewed and approved. The approved fire protection program includes the compliance basis described within Table B-1 and the fire protection program controls identified in the compliance basis are generically applied. Therefore this was not considered a point of confusion requiring clarification in the FAQ.

- 3) This FAQ does not address NFPA 805 1.5.1 on how the possible fires resulting in the use of fuel fired equipment may impact nuclear safety performance criteria.

Response:

NFPA 805-2001, Section 1.5.1, Nuclear Safety Performance Criteria, Fire protection features shall be capable of providing reasonable assurance that, in the event of a fire, the plant is not placed in an unrecoverable condition. To demonstrate this, the following performance criteria shall be met. The performance criteria are: Reactivity Control, Inventory and Pressure Control, Decay Heat Removal, Vital Auxiliaries, and Process Monitoring.

NFPA 805 Chapter 1 is the introduction and it is the other chapters, particularly Chapter 3 – Fundamental Fire Protection Program and Design Elements that provides guidance on how to satisfy the requirements.

- 4) This FAQ does not address NFPA 805 2.4.3 on how fuel fired equipment is addressed in the fire probabilistic risk assessment. For example, it may be reasonable to infrequently use fuel fired equipment (such as welding, lifts, etc.) with a fire watch under normal plant conditions, but following an emergency unknowns regarding human performance may be difficult to quantify. As such, introducing complexity to an emergency to include hot surfaces and lack of redundant containment for combustible fuels, should be avoided unless the potential impact of such actions is fully considered both deterministically and within the fire probabilistic risk assessment.

Response:

The Fire PRA evaluates transient combustibles considering worst case locations and assumes the transient combustibles ignite irrespective of whether or not a fixed ignition source is present. The worst case locations are essentially locations that would result in the challenging fires from a plant risk perspective. The fire protection program controls, including any additional insights from the Fire PRA that may have warranted additional controls, provide the guidance to address fire risk from a day-to-day plant operation standpoint. Fuel fired equipment that is installed plant equipment would have required explicit consideration in both the deterministic fire protection aspects and Fire PRA to account for both the combustible load and potential ignition source. Infrequently used equipment during normal operation that could initiate a fire is included in the initiating event frequencies used in the Fire PRA.

The staff's questions and observations include the statement "but following an emergency unknowns regarding human performance may be difficult to quantify". It is during the emergency situations when plant personnel would need to respond to the unknown that flexibility is needed and the shift manager maintains the authority to implement 10CFR50.54X to accomplish required actions. In some cases the use of fuel fired equipment may be the only reasonable alternative remaining or it may be an easier more efficient approach to implement with reasonable assurance of success to simplify the emergency response rather than introducing complexity. Fuel fired equipment is designed to contain fuel and although there may be some likelihood of this causing a fire, an additional failure must take place for a fire to occur. As this fire is not directly caused by the initiating fire event, it would be considered a concurrent independent fire. Concurrent independent fires are not postulated for other ignition sources in the Fire PRA given that the likelihood is substantially small. As noted in NUREG/CR-6850 on page 11-12, "[T]he analysis is limited to considering a single fire occurring at any given time. The analysis does not consider the possibility of multiple, concurrent fires."

- 5) This FAQ lists several examples of fuel fired equipment used by licensees which is part of an approved design. However, this FAQ does not provide locations of the fuel fired equipment in regards to plant areas containing equipment important to nuclear safety or where there is a potential for radiological releases resulting from a fire.

Response:

The FAQ was generically written and not intended to be plant specific. Adding specifics for all plants would be excessively cumbersome. Instead, a few examples have been mentioned with reference to the approved guidance contained within NFPA 805-2001, and FAQ 07-0032 which provide the basis for the fire protection programs documented in the approved Safety Evaluations.

Installed plant equipment would have been evaluated in the NFPA 805 analysis for deterministic fire protection aspects and the Fire PRA to account for both the combustible load and potential ignition source. Temporary equipment (e.g. lifts or trucks in the plant area) would fall under the controls of the approved fire protection program.