

April 29, 2015

MEMORANDUM TO: APLA Files

FROM: Hossein G. Hamzehee, Branch Chief */RA/*  
PRA Licensing Branch  
Division of Risk Assessment  
Office of Nuclear Reactor Regulation

SUBJECT: CLOSE-OUT OF FIRE PROBABILISTIC RISK ASSESSMENT  
FREQUENTLY ASKED QUESTION 14-0009 ON TREATMENT OF  
WELL-SEALED MCC ELECTRICAL PANELS GREATER THAN  
440V

Background

During industry peer reviews and NRC review of Fire Probabilistic Risk Assessment (FPRA) applications to implement National Fire Protection Association "Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generating Plants" (NFPA 805), methods and approaches that were different from the accepted methods were encountered. U. S. Nuclear Regulatory Commission (NRC) staff collaborated with the Nuclear Energy Institute (NEI) and the nuclear industry to identify these methods, approaches, and factors in current FPRA applications (including but not limited to NFPA 805 applications) that are different from the NRC accepted methods, and to address them by providing clarification through a frequently asked question (FAQ) process. Other differing methods and approaches were also identified to be addressed outside the FAQ process by development of new methods through the Memorandum of Understanding between the Office of Nuclear Regulatory Research (RES) and Electric Power Research Institute (EPRI).

NFPA 805 FAQ 08-0042, "Fire Propagation from Electrical Cabinets," provides guidance and clarification for the treatment of fire propagation from Bin 15 electrical cabinets. When a well-sealed electrical cabinet at 440V or greater is considered, some ambiguity exists with respect to the wording in Chapter 6 of NUREG/CR-6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," its applicability to fire scenario development, and the clarification provided in NFPA 805 FAQ 08-0042. Specifically, questions have arisen regarding the behavior and risk implications of well-sealed motor control centers (MCCs) operating at 440V or greater and their capability of propagating a fire to external targets. FPRA FAQ 14-0009, "Treatment of

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Well-Sealed MCC Electrical Panels Greater Than 440V,” was identified to provide clarification for the treatment of fire propagation from well-sealed MCC electrical cabinets with voltage levels at 440V or greater. The scope of this FAQ is limited to well-sealed, robustly-secured MCCs operating at 440V or greater, and does not apply to other electrical cabinets, notably those already covered by High Energy Arcing Fault (HEAF) analysis. The final revision of FPRA FAQ 14-0009 is provided in the Enclosure (Accession No. ML15118A810).

### Conclusion

The NRC staff and the nuclear industry held a series of public meetings to discuss the resolution of FPRA FAQ 14-0009 along with other FPRA FAQs. Furthermore, a methods review panel under the auspices of RES and EPRI was assembled to review the classification of breach events in the original proposed FAQ solution and amend the proposed FAQ as necessary due to technical discussions. The panel membership, which contained equal industry and NRC participation, included J.S. Hyslop (NRC), Nicholas Melly (NRC), Harold Stiles (Duke Energy), Jeff Stone (Exelon), Gabe Taylor (NRC), and Kiang Zee (ERIN Engineering and Research, Inc.) and the review panel discussions were moderated by Ashley Lindeman (EPRI). The FPRA FAQ was reviewed and finalized by the methods review panel after several technical discussions and teleconferences. The final revision of the FAQ provides a description of the issue, outlines an approach for establishing the fraction of fires originating from a well-sealed MCC that damages external targets. In addition, this FPRA FAQ includes an attachment for establishing a split fraction for the frequency of MCC arcing fires and a probability of breaching a well-sealed MCC. The FAQ also describes potential refinements to the estimation of fire damage that can be applied to the fire PRA. Finally, limited discussions are included regarding the configuration of a MCC and its relationship to the well-sealed MCC.

The guidance in FPRA FAQ 14-0009 is acceptable for use by licensees. This guidance will be endorsed in the next revision to Regulatory Guide 1.205, “Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants.”

Enclosure:  
As stated

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