

May 14, 2015

MEMORANDUM TO: AFPB Files

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SUBJECT: UPDATE OF CLOSE-OUT OF NATIONAL FIRE PROTECTION
ASSOCIATION FREQUENTLY ASKED QUESTION 08-0048,
FIRE IGNITION FREQUENCIES

The purpose of this memorandum is to provide an update to the National Fire Protection Association (NFPA) Standard 805 Frequently Asked Question (FAQ) number 08-0048, (ML092190457), dated September 1, 2009. This update supersedes FAQ 08-0048, in its entirety, with the guidance in NUREG-2169, Electrical Power Research Institute (EPRI) 3002002936, *Nuclear Power Plant Fire Ignition Frequency and Non-Suppression Probability Estimation Using the Updated Fire Events Database, January 2015* (ML15016A069), referred to as NUREG-2169. Additionally, this revision supersedes FAQ 08-0048 in EPRI 1019259, NUREG/CR-6850 Supplement 1 dated September 2010.

Background

In Revision 0 of FAQ 08-0048, the U. S. Nuclear Regulatory Commission (NRC) established an interim position with regard to the use of the ignition frequencies in EPRI 1016735, Chapter 2, Table 2-2, "Updated Bin Frequencies and Statistical Parameters (Individual Bins)." The NRC accepted the use of these ignition frequencies for Fire Probabilistic Risk Assessments (PRAs) for best-/point-estimate calculations of fire risk, with the following provision. The fire PRA must also evaluate the sensitivity of the risk and delta-risk results to evaluations performed using the

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current fire bin ignition frequencies¹ in EPRI 1011989, NUREG/CR-6850, Chapter 6, "Fire Ignition Frequencies," Table 6-1, "Fire Frequency Bins and Generic Frequencies," and Appendix C, "Determination of Generic Fire Frequencies," Table C-3, "Generic Fire Ignition Frequency Model for U.S. Nuclear Power Plants."

At the time of FAQ 08-0048, Revision 0, The NRC's Office of Nuclear Reactor Research (RES) and EPRI had initiated the program to update NUREG/CR-6850 fire events database, to be inclusive through year 2008, as well as to establish a process for subsequent periodic updating. However, the NRC's Office of Nuclear Reactor Regulation staff had not yet completed a confirmatory analysis of the interim ignition frequencies in EPRI 1016735. In order to confirm the interim ignition frequencies, the FAQ indicates that upon successful completion of the update of the fire events database, "NRC-RES and EPRI should jointly revise EPRI 1011989/NUREG/CR-6850, to establish new frequencies for the fire bin ignition categories, eliminating the need for the specific sensitivity analysis cited [in FAQ 48]."

Discussion

In January 2015, RES and EPRI jointly published NUREG-2169/EPRI 3002002936, *Nuclear Power Plant Fire Ignition Frequency and Non-Suppression Probability Estimation Using the Updated Fire Events Database, January 2015*, which contains updated fire ignition frequencies based upon additional data collected from 2000-2009. This fire events database upon which these frequencies are based represents the most recent, comprehensive collection of data.

It should be noted that NUREG-2169 also documents new values for non-suppression probabilities based upon this more complete fire events database. Since the non-suppression values are compatible with the new frequencies, each being based upon this updated database, these new non-suppression values should be used rather than those from FAQ 08-0050 with the fire frequencies from NUREG-2169. FAQ 08-0050 also provides a process for optional scenario specific adjustments to the non-suppression probabilities which may continue to be relevant to NUREG-2169. The staff will review FAQ 08-0050 to determine if any part in addition to the non-suppression probabilities should be superseded by NUREG-2169.

The NRC staff and industry stakeholders are working to assess the current guidance for incorporating new methods and data into fire PRAs supporting NFPA 805. The staff is evaluating the need for more specific implementation guidance than that included in the American Society of Mechanical Engineers/American Nuclear Society PRA Standard, RA-Sa-2009, Section 1-5, on PRA Configuration Control. This guidance will be directed towards all stages of implementation of NFPA 805.

¹ The sensitivity analyses were to be performed for specific ignition frequency bins using the mean of the EPRI 1011989, NUREG/CR-6850 bins. In particular, the analyses was performed for those bins characterized by an alpha from the EPRI 1016735 analysis which was less than or equal to 1. This sensitivity analysis was judged to provide an adequate indication of the effects on risk and delta-risk.

NRC Staff Evaluation

The NRC staff has evaluated the replacement of FAQ 08-0048 with the guidance in NUREG-2169 with respect to regulatory compliance and technical adequacy, and finds that the guidance in NUREG-2169 is acceptable for use by licensees.

References

For details regarding this FAQ, please see the following:

1. NRC Memo to File, A. Klein, Revision 0 to FAQ 08-0048, September 1, 2009, ADAMS Accession No. ML092190457.
2. NUREG-2169/EPRI 3002002936, *Nuclear Power Plant Fire Ignition Frequency and Non-Suppression Probability Estimation Using the Updated Fire Events Database, January 2015*, ADAMS Accession No. ML15016A069.

NRC Staff Evaluation

The NRC staff has evaluated the replacement of FAQ 08-0048 with the guidance in NUREG-2169 with respect to regulatory compliance and technical adequacy, and finds that the guidance in NUREG-2169 is acceptable for use by licensees.

References

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1. NRC Memo to File, A. Klein, Revision 0 to FAQ 08-0048, September 1, 2009, ADAMS Accession No. ML092190457.
2. NUREG-2169/EPRI 3002002936, *Nuclear Power Plant Fire Ignition Frequency and Non-Suppression Probability Estimation Using the Updated Fire Events Database, January 2015*, ADAMS Accession No. ML15016A069.

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