February 12, 2014

MEMORANDUM TO: Joseph G. Giitter, Director
Division of Risk Assessment
Office of Nuclear Reactor Regulation

FROM: Richard P. Correia, Director ***/RA/***
Division of Risk Analysis
Office of Nuclear Regulatory Research

SUBJECT: SUPPLEMENTAL INTERIM TECHNICAL GUIDANCE ON FIRE-INDUCED CIRCUIT FAILURE MODE LIKELIHOOD ANALYSIS

Previously, the U.S. Nuclear Regulatory Commission (NRC) issued an interim technical guidance on hot short-induced spurious operation conditional likelihood estimates (Agencywide Document Access and Management System (ADAMS) Accession No. ML13346A092). This guidance was based on the preliminary results of work being performed jointly between NRC and Electric Power Research Institute (EPRI) under the Memorandum of Understanding (MOU) Addendum on Fire Risk. At the time of issuance, only a fraction of the cases evaluated by the expert panel had been calculated and reviewed. These cases were limited to solenoid operated valves (SOVs) and represented bounding values for other types of circuits.

The purpose of this memorandum is to transmit updated interim technical guidance on fire-induced circuit failure mode likelihood analysis. This is being done in response to a request made by your staff following a National Fire Protection Association (NFPA) 805 Frequently Asked Questions meeting on January 13, 2014. This supplemental interim guidance is based on the recent completion of the NRC-EPRI Fire Probabilistic Risk Analysis (PRA) Expert Elicitation panel. One of your staff was a member of this panel. The enclosure is based on the information developed by the expert panel and is not expected to change as the NUREG/CR-7150 (EPRI 3002001989) Volume 2 report enters publication process. The enclosure provides the latest information developed by the expert panel concerning all conditional probability estimates for hot short-induced spurious operation occurrence and spurious operation duration for control circuits.

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This supplement supersedes the previous interim technical guidance (ADAMS Accession No. ML13346A092). The enclosure provides quantification of specific circuits, such as SOV, motor operated valve and medium voltage circuit breaker control circuits. Please note that the results for the latter two circuits were not available at the time the initial interim technical guidance was issued. In addition, the enclosed supplement includes numerical estimates and guidance for quantifying hot short-induced spurious operation duration. The estimates and guidance for spurious operation duration will be used in the future to update and supersede the current guidance in FAQ 08-0051 included in Supplement 1 to NUREG/CR-6850 (EPRI 1019259).

The NRC and EPRI conducted this Fire PRA Expert Elicitation project with the intent to derive conditional probabilities of occurrence and duration for hot short-induced spurious operations of control circuits. The result of this project significantly advances the state-of-the-art in fire risk analysis. The Fire PRA Expert Elicitation panel builds on the work of the 2002 EPRI expert elicitation, recent testing, as well as the work completed by the Phenomena Identification and Ranking Table panel whose results are presented in Volume 1 of NUREG/CR-7150, ”Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE),” published in October 2012.

The final results of the PRA Expert Elicitation project will be published in Volume 2 of NUREG/CR-7150 and will support a future update to the methodology in NUREG/CR-6850. The results are expected to be in line with the guidance presented in the enclosure. Volume 2 report will provide the detailed documentation and basis for how these results were developed.

Please contact Nicholas Melly of my staff if you require any additional information.

Enclosure:
Supplement to Interim Technical Guidance

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Enclosure:
Supplement to Interim Technical Guidance

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ADAMS Accession No.: ML14017A084

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