[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2016-0232]

Response of Nuclear Power Plant Instrumentation Cables When Exposed to Fire Conditions - Test Plan

AGENCY: Nuclear Regulatory Commission.

ACTION: Draft test plan; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is requesting public comment on the draft test plan entitled, “Response of Nuclear Power Plant Instrumentation Cables When Exposed to Fire Conditions - Test Plan,” in order to receive feedback from the widest range of interested parties and to ensure that all information relevant to developing this document is available to the NRC staff. The purpose of this draft test plan is to better understand the fire-induced failure modes of instrumentation cables and evaluate the potential effect those failure modes could have on plant instrumentation circuits (i.e., circuit, component, and/or system response).

DATES: Submit comments by **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: You may submit comments by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- **Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID **NRC-2016-0232**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.
- **Mail comments to:** Cindy Bladey, Office of Administration, Mail Stop: OWFN-12-H08, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

For additional direction on obtaining information and submitting comments, see "Obtaining Information and Submitting Comments" in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION, CONTACT: Gabriel Taylor, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-0781, e-mail: Gabriel.Taylor@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID **NRC-2016-0232** when contacting the NRC about the availability of information for this action. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for

Docket ID **NRC-2016-0232**.

- **NRC's Agencywide Documents Access and Management System (ADAMS):**

You may obtain publicly-available documents online in the ADAMS Public Documents collection at http://www.nrc.gov/reading-rm/adams.html. To begin the search, select "ADAMS Public Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The draft test plan, "Response of Nuclear Power Plant Instrumentation Cables When Exposed to Fire Conditions - Test Plan," is available in ADAMS under Accession No. ML16309A608.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID **NRC-2016-0232** in the subject line of your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC posts all comment submissions at http://www.regulations.gov as well as entering the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information

before making the comment submissions available to the public or entering the comment into ADAMS.

II. Discussion

In 1990, the NRC sponsored a series of tests at Sandia National Laboratories (SNL) to investigate the effects of thermal aging on fire damageability, documented in NUREG/CR-5546, "An Investigation of the Effects of Thermal Aging on the Fire Damageability of Electric Cables" (ADAMS Accession No. ML041270223). An instrumentation cable was tested to determine the failure time and temperature for both aged and unaged cables. During the testing, levels of leakage current, on the order of 15 mA, were observed prior to the onset of catastrophic failure. In 2001, additional testing was performed by the Nuclear Energy Institute and the Electric Power Research Institute. The NRC was invited to observe and participate by sponsoring SNL to evaluate various cables and instrumentation techniques. Six tests included instrumentation cables and those results are documented in NUREG/CR-6776, "Cable Insulation Resistance Measurements Made During Cable Fire Tests" (ADAMS Accession No. ML022600316). Those results indicated pronounced differences observed between the failure of the thermoplastic and thermoset insulated cables. In previous years the NRC has published cable functionality test reports which focused on power and control cables when exposed to fire conditions including: NUREG/CR-7102, "Kerite Analysis in Thermal Environment of FIRE (KATE-Fire): Test Results" (ADAMS Accession No. ML11333A033), NUREG/CR-7010, Volume 1, "Cable Heat Release, Ignition, and Spread in Tray Installations During Fire (CHRISTIFIRE), Phase 1: Horizontal Trays" (ADAMS Accession No. ML12213A056), NUREG/CR-7010, Volume 2, "Cable Heat Release, Ignition, and Spread in Tray Installations During Fire (CHRISTIFIRE), Phase 2: Vertical Shafts and Corridors" (ADAMS Accession No. ML13346A045), NUREG-2128, "Electrical Cable Test Results and Analysis During Fire Exposure (ELECTRA-FIRE), A

Consolidation of Three Major Fire-Induced Circuit and Cable Failure Experiments Performed Between 2001 and 2011" (ADAMS Accession No. ML13253A087), NUREG/CR-7150, Volume 1, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE)" (ADAMS Accession No. ML12313A105), NUREG/CR-7150, Volume 2, "Joint Assessment of Cable Damage and Quantification of Effects from Fire (JACQUE-FIRE)" (ADAMS Accession No. ML14141A129).

The purpose of this draft test plan is to better understand the fire-induced failure modes of instrumentation cables and evaluate the potential effect those failure modes could have on plant instrumentation circuits (i.e., circuit, component, and/or system response). Specifically, this research is intended to better quantify the signal leakage characteristics that may occur before catastrophic failure in instrumentation circuits.

The NRC is requesting public comment in order to receive feedback from the widest range of interested parties and to ensure that all information relevant to developing this document is available to the NRC staff. This document is not intended for interim use. The NRC will review public comments received on the document, incorporate suggested changes as necessary, and make the final test plan available.

Dated at Rockville, Maryland, this 4th day of November, 2016.

For the Nuclear Regulatory Commission.

Mark Henry Salley, Chief,
Fire and External Hazard Analysis Branch,
Division of Risk Analysis,
Office of Nuclear Regulatory Research.

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