

## NUCLEAR REGULATORY COMMISSION

[NRC–2015–0059]

### Refining and Characterizing Heat Release Rates From Electrical Enclosures During Fire (RACHELLE–FIRE)

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Draft NUREG; request for comment.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is issuing for public comment a draft NUREG, NUREG–2178 (EPRI 3002005578), “Refining and Characterizing Heat Release Rates from Electrical Enclosures During Fire (RACHELLE–FIRE), Volume 1: Peak Heat Release Rates and Effect of Obstructed Plume.”

**DATES:** Submit comments by June 15, 2015. 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 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–2015–0059. Address questions about NRC dockets to Carol Gallagher; telephone: 301–415–3463; email: [Carol.Gallagher@nrc.gov](mailto: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:** David Stroup, Office of Nuclear Regulatory Research; telephone: 301–251–7609; email: [David.Stroup@nrc.gov](mailto:David.Stroup@nrc.gov); U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001.

#### **SUPPLEMENTARY INFORMATION:**

#### **I. Obtaining Information and Submitting Comments**

##### *A. Obtaining Information*

Please refer to Docket ID NRC–2015–0059 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–2015–0059.
- 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 email to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in the **SUPPLEMENTARY INFORMATION** section. Draft NUREG–2178, “Refining and Characterizing Heat Release Rates from Electrical Enclosures During Fire (RACHELLE–FIRE), is available in ADAMS under Accession No. ML15056A144.

- 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–2015–0059 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 publically disclosed in your comment submission. The NRC will post all comment submissions at <http://www.regulations.gov> as well as enter 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**

The Refining and Characterizing Heat Release Rates From Electrical

Enclosures During Fire (RACHELLE–FIRE) program involves a working group of experienced fire protection and fire probabilistic risk assessment researchers and practitioners focused on enhancing the methodology used to model electrical enclosure fires in nuclear power plants. This report documents the results from the working group’s efforts to develop technical information in three areas: (1) Classification of electrical enclosures in terms of function, size, contents, and ventilation; (2) determination of peak heat release rate (HRR) probability distributions considering specific electrical enclosure characteristics; and (3) development of a method to account for the impact of the enclosure on the vertical thermal zone of influence above the enclosure during fire. Electrical enclosures have been classified in groups based on their electrical function, contents, and size. Peak HRR distributions for the different classification groups have been developed. These distributions are based on the results of different experimental programs intended to measure the HRR associated with fires in electrical enclosures. In order to provide a comprehensive characterization of electrical enclosure fires, the working group evaluated the temperature characteristics of fire plumes associated with these events using the Fire Dynamics Simulator program. Computer simulations of various enclosure configurations were developed for evaluating the fire burning inside electrical enclosures and the fire plume temperature characteristics that would be generated. Based on this research, new fire plume temperature profiles reflecting the obstructed nature of fire plumes generated from fires inside electrical enclosures are provided. Finally, examples, consolidating the information described in this report, are provided to illustrate how to incorporate the information documented in this report into existing approaches for modeling fires in electrical enclosures.

Dated at Rockville, Maryland, this 21st day of April, 2015.

For the Nuclear Regulatory Commission.

**Mark Henry Salley,**

*Chief, Fire Research Branch, Division of Risk Analysis, Office of Nuclear Regulatory Research.*

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