

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
OFFICE OF NEW REACTORS  
WASHINGTON, DC 20555-0001

February 6, 2017

**NRC DRAFT REGULATORY ISSUE SUMMARY 2017-##**  
**STATUS OF REGULATORY ACTIONS TAKEN TO ADDRESS GAS ACCUMULATION IN**  
**EMERGENCY CORE COOLING, DECAY HEAT REMOVAL, AND CONTAINMENT SPRAY**  
**SYSTEMS**

**ADDRESSEES**

All holders of an operating license or construction permit for a nuclear power reactor under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

All holders of and applicants for a power reactor early site permit, combined license, standard design certification, standard design approval, or manufacturing license under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

**INTENT**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to inform addressees of the status of generic programmatic and licensing issues identified through the NRC's review of responses to Generic Letter (GL) 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," dated January 11, 2008,<sup>1</sup> and tracking of licensee actions to resolve issues identified in the GL. This RIS requires no action or written response on the part of addressees.

**BACKGROUND INFORMATION**

Instances of gas accumulation in various plant systems have occurred since the beginning of commercial nuclear power plant operation. The NRC issued GL 2008-01 to (1) request that addressees submit information to demonstrate that the subject systems are in compliance with the current licensing and design bases and applicable regulatory requirements, and that suitable design, operational, and testing control measures are in place for maintaining this compliance, and (2) collect the requested information to determine whether additional regulatory action is required.

The NRC staff performed a detailed review of the licensee responses to GL 2008-01 to determine whether there was reasonable assurance that the subject systems were operable, and issued individual closure letters for GL 2008-01 for each plant. In addition, the staff

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML072910759

**ML16244A787**

developed temporary instruction 2515/177, “Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems (NRC Generic Letter 2008-01),” issued June 9, 2009,<sup>2</sup> to facilitate uniform NRC inspector verification that licensee actions were consistent with the information provided in their responses to GL 2008-01.

The staff also identified, as a result of its review of the GL 2008-01 response, that some plants’ technical specifications (TS) did not cover all systems or locations susceptible to gas accumulation. Accordingly, the staff also determined that enhancements to TS and the standard technical specifications (STS) would be desirable. The nuclear industry undertook two primary initiatives to address the desired regulatory guidance and TS enhancements. As part of the nuclear industry’s response to GL 2008-01, the Nuclear Energy Institute (NEI) submitted NEI 09-10, “Guidelines for Effective Prevention and Management of System Gas Accumulation,” Revision 1, dated December 21, 2010.<sup>3</sup> The NRC reviewed the guidelines and found them acceptable for use, as documented in “Final Safety Evaluation of Nuclear Energy Institute Topical Report NEI 09-10, Revision 1A, ‘Guidelines for Effective Prevention and Management of System Gas Accumulation,’” dated March 19, 2013.<sup>4</sup> Thereafter, the NRC issued RIS 2013-09, “NRC Endorsement of NEI 09-10, Revision 1a-A, ‘Guidelines for Effective Prevention and Management of System Gas Accumulation,’” dated August 23, 2013,<sup>5</sup> to communicate its position that NEI 09-10 documented an acceptable and recommended approach for managing gas accumulation.

The STS<sup>6</sup> include a surveillance requirement for ensuring the emergency core cooling systems are full of water. However, NRC inspections and plant-specific TS reviews showed that plant-specific TS and the STS did not cover all important to safety systems where gas accumulation could result in inoperability, and therefore, may not demonstrate operability of the subject systems with respect to gas accumulation. In addition, the TS phrase “full of water” can create confusion when evaluating operability. Task Interface Agreement 2008-03, “Emergency Core Cooling System (ECCS) Voiding Relative to Compliance with Surveillance Requirements (SR) 3.5.1.1, 3.5.2.3, and 3.5.3.1 (TIA 2008-03),” dated October 21, 2008,<sup>7</sup> confirmed operability by a reasonable expectation that the system in question will perform its specified safety function, and the system piping can be considered filled with water such that the surveillance requirement is met. The surveillance requirements can be met in the presence of known and properly evaluated voids, consistent with the applicable staff regulatory position. The staff determined that the plant-specific TS and STS must be improved, consistent with Administrative Letter 98-10, “Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety,” dated December 29, 1998.<sup>8</sup>

To address this issue, the Technical Specification Task Force (TSTF) submitted TSTF-523, “Generic Letter 2008-01, Managing Gas Accumulation,” Revision 0, on

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<sup>2</sup> ADAMS Accession No. ML082950666

<sup>3</sup> ADAMS Accession No. ML110030892

<sup>4</sup> ADAMS Accession No. ML12342A368

<sup>5</sup> ADAMS Accession No. ML13178A152

<sup>6</sup> NUREG-1430, “Standard Technical Specifications—Babcock and Wilcox Plants,” NUREG-1431, “Standard Technical Specifications—Westinghouse Plants,” NUREG-1432, “Standard Technical Specifications—Combustion Engineering Plants,” NUREG-1433, “Standard Technical Specifications—General Electric Plants BWR/4,” and NUREG-1434, “Standard Technical Specifications—General Electric Plants, BWR/6”

<sup>7</sup> ADAMS Accession No. ML082560209

<sup>8</sup> ADAMS Accession No. ML031110108

June 29, 2010.<sup>9</sup> The NRC accepted TSTF-523 for review on March 2, 2011<sup>10</sup>, but ultimately determined that it was unacceptable<sup>11</sup>. After numerous public meetings to discuss revisions to TSTF-523, the TSTF submitted Revision 1 of TSTF-523 to the NRC for review on March 29, 2012,<sup>12</sup> which the NRC accepted for review on June 13, 2012.<sup>13</sup> The NRC raised additional concerns with Revision 1 of TSTF-523, and the TSTF agreed to address these concerns by developing Revision 2, which was submitted to the NRC for review on February 21, 2013<sup>14</sup>. The staff ultimately approved for use TSTF-523, Revision 2, in a *Federal Register* (FR) notice on January 15, 2014 (79 FR 2700), and issued a model safety evaluation.<sup>15</sup>

## **SUMMARY OF ISSUE**

While the NRC issued plant-specific closure letters following its review of information submitted in response to GL 2008-01, these closure letters did not address development of additional regulatory guidance or enhancements to both plant-specific TS and STS requirements. The nuclear industry undertook two generic efforts to address these issues—NEI 09-10 and TSTF-523. The NRC staff accepted the incorporation of a gas management program consistent with NEI 09-10 and the adoption of TSTF-523 as approaches for plants to sufficiently demonstrate the continued operability of safety significant systems susceptible to gas accumulation.

Licensees must comply with their plant-specific license to maintain TS systems operable or follow applicable TS action statements. The accumulation of gas in systems can result in system inoperability and, therefore, gas accumulation must be appropriately managed. NEI 09-10 and TSTF-523 have been determined by the NRC to be an acceptable means of managing gas accumulation. Licensees who choose not to implement NEI 09-10 and TSTF-523 are still responsible for ensuring, through some other appropriate means, that TS systems remain operable with respect to the potential for accumulation of gas, in accordance with their plant-specific TS.

## **BACKFITTING AND ISSUE FINALITY DISCUSSION**

This draft RIS is intended to advise nuclear power plant licensees that: (i) they must comply with applicable TS with respect to TS operability and applicable action statements if a system is determined to be inoperable due to gas accumulation; (ii) NEI 09-10 and TSTF-523 have been determined by the NRC to be an acceptable means of managing gas accumulation in systems which can result in system inoperability; and (iii) licensees who do not follow NEI 09-10 and TSTF-523 must nonetheless comply with applicable NRC requirements and the plant-specific TS on gas accumulation and operability.

The draft RIS, if finalized, would not require any action or written response on the part of any addressee. Accordingly, issuance of this RIS in final form would not represent backfitting as defined in 10 CFR § 50.109(a)(1), and would not be a violation of any issue finality provision in 10 CFR Part 52. Therefore, the NRC did not prepare a backfit analysis for this draft RIS or further address the issue finality criteria in Part 52. If the NRC takes additional regulatory action

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<sup>9</sup> ADAMS Accession No. ML101800175

<sup>10</sup> ADAMS Accession No. ML110590872

<sup>11</sup> ADAMS Accession No. ML111430832

<sup>12</sup> ADAMS Accession No. ML12089A356

<sup>13</sup> ADAMS Accession No. ML12158A547

<sup>14</sup> ADAMS Accession No. ML13053A075

<sup>15</sup> ADAMS Accession No. ML13255A169

against a licensee with respect to operability concerns due to gas accumulation, the NRC will address backfitting and/or issue finality, as applicable, at the time that it takes such action.

**FEDERAL REGISTER NOTIFICATION**

[Discussion to be provided in final RIS.]

**CONGRESSIONAL REVIEW ACT**

[Discussion to be provided in final RIS.]

**PAPERWORK REDUCTION ACT STATEMENT**

This RIS does not contain new or amended information collection requirements that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing requirements were approved by the Office of Management and Budget (OMB) under control numbers 3150-0011 and 3150-0151.

**Public Protection Notification**

The NRC may not conduct or sponsor, and a person is not required to respond to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

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Note: NRC generic communications may be found on the NRC public Web site, <http://www.nrc.gov>, under NRC Library/Document Collections.

**DRAFT REGULATORY ISSUE SUMMARY 2017-XX, "STATUS OF REGULATORY ACTIONS TAKEN TO ADDRESS GAS ACCUMULATION IN EMERGENCY CORE COOLING, DECAY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS," DATE: February 6, 2017**

ADAMS Accession Nos.: Pkg.: ML17032A096; FRN: ML17031A441; Memo to ADM: ML17032A092; RIS: ML16244A787;  
\*concurred via email

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