



UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001

ACRSR-2271

October 19, 2007

Mr. Luis A. Reyes
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: DRAFT FINAL GENERIC LETTER 2007-XX, "MANAGING GAS INTRUSION IN EMERGENCY CORE COOLING, DECAY HEAT REMOVAL, AND CONTAINMENT SPRAY SYSTEMS"

Dear Mr. Reyes:

During the 546th meeting of the Advisory Committee on Reactor Safeguards, October 4-5, 2007, we reviewed the draft final Generic Letter 2007-XX, "Managing Gas Intrusion in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems." During our review, we had the benefit of discussions with representatives of the NRC staff and the Nuclear Energy Institute. We also had the benefit of the documents referenced.

RECOMMENDATION

Generic Letter 2007-XX, "Managing Gas Intrusion in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," should be issued as final.

BACKGROUND

Gas intrusion into the emergency core cooling, decay heat removal, and containment spray systems ("subject systems") can lead to loss of operability or degradation of performance. It may also lead to piping damage due to water hammer effects. Over the past 20 years, the NRC staff has published 20 Information Notices, two Generic Letters, and a NUREG, and also interacted with the nuclear industry many times regarding the gas intrusion issue. An event in 1997 at Oconee Unit 3 damaged two of the plant's three high-pressure injection pumps and rendered them nonfunctional. Following that event, an industry-wide initiative was undertaken to address the gas intrusion issue. Based on the industry's actions, the NRC staff concluded that no generic action was necessary at that time. However, despite the design and operational measures taken to prevent gas intrusion and accumulation in the subject systems, and the high level of awareness of their potential impact on system performance, significant gas intrusion events have continued to occur, prompting the issuance of this Generic Letter.

DISCUSSION

Emergency core cooling, decay heat removal, and containment spray systems must be sufficiently full of water in order to successfully fulfill their intended functions when called upon during an accident. The number of gas intrusion problems that have been identified at some facilities raises concerns as to whether similar problems exist at other facilities.

Technical Specifications (TS) require periodic surveillance of the subject systems to confirm operability. The frequent occurrence of gas intrusion events and lack of detailed documentation of surveillance results point to TS weaknesses. We believe these weaknesses need to be addressed.

The amount of gas that can be ingested without significant impact on pump operability and reliability is not well established. NUREG/CR-2792 provides some guidance (based on expert opinions) on the amount of gas ingestion that can be tolerated without significant degradation of pump performance. The industry plans to perform work to develop additional criteria to assess operability. Studies will also be performed to evaluate gas detection techniques and the associated accuracies. We would like the opportunity to review any proposed interim measures or topical reports developed as a result of this Generic Letter.

The staff's resolution of the public comments provided during the process of preparing this Generic Letter is appropriate. We agree with the staff and the industry that it is important to share the information to be developed as a result of this Generic Letter with the Office of New Reactors and the industry's New Reactors Working Group.

Sincerely,

/RA/

William J. Shack
Chairman

REFERENCES:

1. Memorandum dated October 1, 2007, from James T. Wiggins, Deputy Director, Office of Nuclear Reactor Regulation, to Frank P. Gillespie, Executive Director, Advisory Committee on Reactor Safeguards, transmitting:
 - Proposed Generic Letter 2007-XX, "Managing Gas Intrusion in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems" (ML053460427).
 - Staff Resolution of Public Comments Received on the Proposed Generic Letter (ML072410212).
 - Redline/Strikeout Version of Proposed GL Showing Changes Due to Public Comments (ML072410253).
2. U.S. Nuclear Regulatory Commission/Creare Inc., P.S. Kamath, T.J. Tantillo, W.L. Swift, NUREG/CR-2792, "An Assessment of Residual Heat Removal and Containment Spray Pump Performance Under Air and Debris Ingesting Conditions," September 1982.

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Letter To: Mr. Luis A. Reyes
Executive Director for Operations

From: William J. Shack, Chairman
Advisory Committee on Reactor Safeguards

Date: October 19, 2007

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