POLICY ISSUE
(Information)

August 8, 2003 SECY-03-0136

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations /RA/

SUBJECT: PROPOSED BULLETIN: "LEAKAGE FROM REACTOR PRESSURE VESSEL LOWER HEAD PENETRATIONS AND REACTOR COOLANT PRESSURE BOUNDARY INTEGRITY"

PURPOSE:

To inform the Commission of the staff's intention to issue the attached bulletin to address concerns about the inspection of the reactor pressure vessel (RPV) lower head penetrations at pressurized-water reactors (PWRs).

BACKGROUND:

The RPV lower head and its penetrations comprise an integral part of the reactor coolant pressure boundary, and their integrity is important to the safe operation of nuclear power plants. The recent identification of cracking in, and leakage from, two RPV lower head penetrations at South Texas Project (STP), Unit 1, raises questions about potential degradation mechanisms that may be active in this area. In addition, information provided in licensees' responses to Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated March 18, 2002, has raised questions about the adequacy of inspections performed at many PWRs to detect leakage from RPV lower head penetrations. A summary of the Nuclear Regulatory Commission (NRC) staff's review of the responses to Bulletin 2002-01 is provided in Regulatory Issue Summary (RIS) 2003-13, "NRC Review of Responses to Bulletin 2002-01, 'Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity,'" dated July 29, 2003. The RIS informs the industry that the staff has concluded that the inspections performed at many PWRs would not detect leakage such as that discovered at STP Unit 1.

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The small amount of leakage from the cracks discovered at STP Unit 1 did not represent an immediate safety problem due to the size and orientation of the cracks. In addition, safety systems included in plant designs and required to be available during plant operation would be able to mitigate the effects of more significant leaks, including a gross rupture of an RPV lower head penetration. Although unlikely, a significant leak from an RPV lower head penetration could introduce operational and safety concerns since it would require operation of safety systems for an extended period and complicate longer term efforts to stabilize the plant. To maintain the overall defense-in-depth philosophy incorporated into the design and operation of nuclear power plants, licensees should take appropriate actions to ensure the integrity of the RPV lower head penetrations.

The staff is working with the nuclear industry and other stakeholders to revise the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code as well as the related NRC regulations to address the inspection of reactor coolant pressure boundary locations (including RPV penetrations) that are susceptible to cracking. The staff has incorporated these activities into the appropriate action plans, but they will not be completed for several years. Consequently, the staff believes it is appropriate, given the potential safety significance of the issue, to take interim actions to address uncertainties about the condition of the RPV lower head penetrations at many PWRs.

DISCUSSION:

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and Title 10, Section 50.54(f) of the *Code of Federal Regulations* (10 CFR 50.54(f)), the attached bulletin transmits an information request, asking licensees to verify compliance with existing applicable regulatory requirements (see the “Applicable Regulatory Requirements” section of the bulletin). Specifically, the attached bulletin requests information to enable the staff to determine whether current inspection and maintenance practices ensure the integrity of RPV lower head penetrations at PWRs, as required by NRC regulations and plant specific licenses. The requested information will also enable the staff to determine whether the subject PWR addressees need to augment their inspection and maintenance practices to ensure that cracking of RPV lower head penetrations or penetration welds will not pose any undue risk to public health and safety. The staff will use this information in assessing the need for, and guiding the development of, additional regulatory actions (e.g., generic communications, orders, or rulemaking) to address the integrity of the reactor coolant pressure boundary.

The actions requested in the attached bulletin are similar to the recommendations made by the industry’s Materials Reliability Program. Nonetheless, the staff recognizes that we need to have continued communication with the industry and other stakeholders to effectively resolve the issues identified in the bulletin. Toward that end, the staff plans to hold a public meeting with external stakeholders (currently scheduled for the morning of August 19, 2003) to explain the staff’s rationale for issuing the bulletin and to answer questions about our expectations with regard to the information that licensees should provide in their responses. In addition, the staff plans to discuss the processes that licensees will use to disposition inspection findings.

The staff intends to issue the attached bulletin in early to mid-August 2003 in order for those plants that have scheduled refueling outages during the remainder of calendar year 2003 to plan accordingly.

COORDINATION:

The staff briefed the Committee to Review Generic Requirements (CRGR) on the proposed bulletin on July 28, 2003, and has addressed the Committee's comments. The CRGR has endorsed this bulletin.

The Office of the General Counsel (OGC) has reviewed the proposed bulletin and has no legal objections to its content. In addition, OGC has determined that the proposed bulletin does not constitute a "rule" under the Small Business Regulatory Enforcement Fairness Act of 1996.

/RA/

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Executive Director
for Operations

Attachment: Proposed NRC Bulletin, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity"

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Attachment: Proposed NRC Bulletin, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity"

Package No.: ML032110411
Proposed Bulletin No.: ML032110427 **NRR--052**
ADAMS Memo Accession No.: ML032110383 **SECY-012**

* See Previous Concurrence

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