

POLICY ISSUE INFORMATION

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SECY-02-0148

FOR: The Commissioners

FROM: William D. Travers
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SUBJECT: SUMMARY OF ACTIVITIES RELATED TO GENERIC SAFETY ISSUES

PURPOSE:

To provide the annual summary of activities related to generic safety issues (GSIs).

BACKGROUND:

It has been the practice of the staff since 1983 to provide the Commission with an annual update of the progress made in resolving GSIs. This practice was reinforced by the Commission in a staff requirements memorandum (SRM) of May 8, 1998, in response to SECY-98-030, "Implementation of DSI-22, Research." In the SRM, the Commission directed the staff to provide an annual summary of activities related to open reactor and non-reactor GSIs.

DISCUSSION:

The NRC program for addressing reactor and non-reactor generic issues is delineated in Management Directive (MD) 6.4, "Generic Issues Program." MD 6.4 was issued in December 2001. The program described in MD 6.4 consists of seven stages: (1) identification, (2) initial screening, (3) technical assessment, (4) regulation and guidance development, (5) regulation and guidance issuance, (6) implementation, and (7) verification. Candidate generic issues may be identified by organizations or individuals internal or external to the NRC. Generally, safety

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concerns associated with operating events, research results, or risk assessments form the basis for the identification of GSIs by the staff, the ACRS, industry, or the public. After an issue is identified, initial screening is performed to determine whether it should be processed as a GSI, excluded from further analysis, or sent to another NRC program for review. In the technical assessment stage, a determination is made as to whether the issue involves adequate protection, safety enhancement, or burden reduction. Technical findings are used as the basis for developing or revising rules, guidance, and programs. In the final three stages, regulation or guidance is issued by the NRC, implemented by licensees or certificate holders, and verified by the NRC. GSIs identified after March 1999 have been processed in accordance with MD 6.4. The Office of Nuclear Regulatory Research (RES) tracks the status of all generic issues in the agency-wide Generic Issue Management Control System (GIMCS) and documents the technical assessments and dispositions of all issues in NUREG-0933, "A Prioritization of Generic Safety Issues."

REACTOR GSIs

For generic issues associated with nuclear reactor power plants, RES is responsible for screening all new generic issues and performing the technical assessments of the majority of GSIs. The Office of Nuclear Reactor Regulation (NRR) is responsible for technical assessments that require extensive interface with operating plants and for determining the appropriate regulatory actions for GSIs that have favorable safety and cost/benefit estimates. The following is a summary of the activities related to reactor GSIs since the last report to the Commission in SECY-01-0139 on July 27, 2001.

- One new GSI was identified for initial screening:
 - 192 Secondary Containment Drawdown Time: This issue was raised by NRR and it addresses the adequacy of the calculations, testing, and acceptance criteria related to the creation of a vacuum in the reactor building of a BWR following an engineered safeguards actuation signal.
- Initial screening was completed for the following two GSIs which are undergoing technical assessment:
 - 188 Steam Generator Tube Leaks/Ruptures Concurrent with Containment Bypass: This issue was raised by an RES staff member, and it arose from some operating and test experience that suggested that a main steam line break in a PWR can cause resonant vibration of steam generator tubes. This vibration raised the possibility of steam generator tubes rupturing during the course of an accident initiated by a main steam line break.
 - 189 Susceptibility of Ice Condenser Containments to Early Failure from Hydrogen Combustion During a Severe Accident: This issue was proposed in response to SECY 00-198, "Status Report on Study of Risk-Informed Changes to 10 CFR 50.44 (Combustible Gas Control)." Recent research indicated that, for PWR ice condenser containments and BWR Mark III containments that have a relatively low free volume and containment strength, the early containment failure

probability is dominated by hydrogen combustion events. These containments are equipped with igniters that are intended to control hydrogen concentrations by initiating limited “burns” before a large quantity accumulates. However, if the accident is initiated by a station blackout event, these igniters, which are AC-powered, will not be available. The issue is whether these igniters should be equipped with an alternative power supply. The staff briefed the ACRS on the technical assessment on June 6, 2002, and is working to resolve the issue on an expedited schedule, as directed by the Commission.

- Based on the results of ongoing technical assessments, one GSI was identified as needing appropriate regulatory action by NRR:

191 Assessment of Debris Accumulation on PWR Sump Performance: This issue was raised by NRR because the results of research on BWR emergency core cooling system suction strainer blockage identified new phenomena and failure modes that were not previously considered. In addition, operating experience identified new contributors to debris and possible blockage of PWR sumps, such as degraded or failed containment paint coatings.

- Two GSIs were closed with no new or revised requirements for licensees (Attachment 1):

172 Multiple System Responses Program (MSRP): This issue was raised by the ACRS, during the review of several other generic safety issues (USIs A-17, A-46, and A-47), because of a concern that, because of scope limitations on each issue and a possible lack of coordination between issues, there was a possibility that some potentially significant safety concerns were not being addressed. The purpose of the MSRP was to gather and review documentation and identify any issues that may have been missed. The MSRP program identified 21 potential safety issues. These issues were then addressed as part of the IPE and IPEEE programs. Some were addressed by explicit request of the licensees, and some were resolved during the course of the IPE and IPEEE reviews. Following the completion of the IPE and IPEEE programs, the issue was closed.

173.A Spent Fuel Storage Pool: Operating Facilities: This issue was raised by two engineers at a plant who contended that the spent fuel pool failed to meet regulatory requirements with respect to a sustained loss of pool cooling function after a loss of offsite power or a loss of coolant accident. To respond to this concern, the staff performed plant-specific evaluations of certain design features that increased the potential for a loss of coolant inventory, a sustained loss of forced cooling, or adverse effects on operating reactor systems from boiling spent fuel pools. Several licensees took voluntary actions to address the concerns identified at their facilities. For the remaining facilities, the staff concluded that no new or revised requirements were justified, and the generic issue was closed.

Since the inception of the generic issues program in 1976, 833 of the 842 reactor issues identified have been closed. Two issues are undergoing screening, and the status of completion of the remaining seven open reactor GSIs is summarized in Attachment 2.

NON-REACTOR GSIs

NMSS is primarily responsible for processing non-reactor GSIs through all stages of MD 6.4. The status of the unresolved non-reactor GSIs is tracked by RES in the quarterly updates of GIMCS. The following is a summary of the activities related to non-reactor GSIs since the last report to the Commission in SECY-01-0139:

- No new GSIs were identified for screening.
- One GSI was closed with no new or revised requirements for licensees (Attachment 1):

NMSS-10 Troxler Gauge Source Rod Weld Failures: The staff worked with the Agreement State of North Carolina to ensure that cracked source rods on Troxler moisture density gauges were repaired or replaced and that the manufacturing process was reviewed/modified to reduce the potential for recurrence. Troxler amended its maintenance procedure to inspect for cracks and corrected its design. Thus, the issue was closed in November 2001.

Currently, three non-reactor GSIs remain open and the status of their completion is summarized in Attachment 2.

CONCLUSION:

Since the last report to the Commission on July 27, 2001, two reactor GSIs and one non-reactor GSI were closed as the staff continued to implement the process of MD 6.4 to identify and resolve reactor and non-reactor GSIs. The staff will continue to provide an annual update to the Commission on activities related to GSIs and will inform the Commission of any significant developments.

/RA/

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- Attachments: 1. GSIs Closed since June 30, 2001
2. Open GSIs as of June 27, 2002

GSIs Closed Since June 30, 2001

GSI Number	Title	Identification Date	Lead Office	Status
172	Multiple System Responses Program (MSRP)	10/1989	RES	This issue was identified to address 21 potential safety concerns that were raised by the Advisory Committee on Reactor Safeguards (ACRS) during the resolution of Unresolved Safety Issues A-17, "Systems Interactions in Nuclear Power Plants"; A-46, "Seismic Qualification of Equipment in Operating Plants"; and A-47, "Safety Implications of Control Systems." In resolving the issue, the staff developed guidance for the review of the safety concerns of GSI-172 in the Individual Plant Examination (IPE) and the Individual Plant Examination of External Events (IPEEE) programs. In the review of licensee submittals in response to the IPE and IPEEE, no significant contributor to core damage frequency (CDF) was identified. Therefore, the staff concluded that no new or revised licensee requirements were warranted. Thus, the issue was closed in January 2002.
173.A	Spent Fuel Storage Pool: Operating Facilities	02/1996	NRR	This issue addressed the adequacy of regulatory requirements for a sustained loss of spent fuel pool cooling after a loss of offsite power or a loss-of-coolant accident. In resolving the issue, the staff developed screening criteria for reactor accidents in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants." Plant-specific evaluations were then performed by estimating the frequency of a significant loss of coolant inventory or a sustained loss of cooling. These estimated frequencies were compared with the criteria of NUREG-1738 and the staff concluded that no new or revised requirements were warranted. Thus, the issue was closed in December 2001.
NMSS-10	Troxler Gauge Source Rod Weld Failures	05/1998	NMSS	The staff worked with the Agreement State of North Carolina to ensure that cracked source rods on Troxler moisture density gauges were repaired or replaced and that the manufacturing process was reviewed/modified to reduce the potential for recurrence. Troxler amended its maintenance procedure to inspect for cracks and corrected its design. Thus, the issue was closed in November 2001.

Open GSIs as of June 27, 2002

GSI Number	Title	Identification Date	Lead Office	Status
156.6.1	Pipe Break Effects on Systems and Components	02/1991	RES	This issue addresses the safety concern of whether the effects of pipe breaks inside the containment have been adequately addressed in the designs of some plants. A risk analysis performed by the staff in 1994 showed the issue to have some safety significance but with large uncertainty. A more comprehensive study was undertaken to review pipe failure rate data and pipe break methodologies. The issue is in the technical assessment stage, and the staff is presently conducting a comparison of the findings of a BWR Owners' Group and the INEEL study used in the initial screening of the issue. A recommendation on the development of regulation and guidance is scheduled for November 2002.
163	Multiple Steam Generator Tube Leakage	06/1992	NRR	This issue addresses the safety concern associated with multiple steam generator tube leaks during a main steam line break that cannot be isolated. This issue is an integral part of the agency-wide Steam Generator Action Plan, which encompasses several complex technical sub-issues with milestones that were scheduled for completion beginning in FY-2001. Completion of the technical assessment of GSI-163 is scheduled for September 2005.
168	Environmental Qualification of Electrical Equipment	04/1993	RES	Accelerated-aging tests on electrical equipment showed that some of the environmentally qualified cables either failed or exhibited marginal insulation resistance. Failure of the cables during or following a design basis event could affect the performance of safety functions. On behalf of the industry, NEI and IEEE provided industry positions and relevant information to the staff in October 2001. Since then, Okonite completed testing of their single conductor, bonded-jacket cables. The results will be appropriately factored into the completion of GSI-168 as the staff continues to explore voluntary industry initiatives to resolve the issue. In June 2002, the staff presented its approach to the ACRS for completing the technical assessment of the issue.

Open GSIs as of June 27, 2002

GSI Number	Title	Identification Date	Lead Office	Status
185	Control of Recriticality Following Small-Break LOCA in PWRs	01/1999	RES	This issue addresses small-break-LOCA scenarios in PWRs that involve steam generation in the core and condensation in the steam generators, causing deborated water to accumulate in part of the RCS. Restart of the RCS circulation may cause a recriticality event (reactivity excursion) by moving the deborated water into the core. Completion of the technical assessment of the GSI is scheduled for September 2005.
188	Steam Generator Tube Leaks/Ruptures Concurrent with Containment Bypass	05/2001	RES	This issue addresses the effects on the validity of steam generator tube leak and rupture analyses of resonance vibrations in steam generator tubes during steam line break depressurization. Completion of the technical assessment of the GSI is scheduled for September 2004.
189	Susceptibility of Ice Condenser and MARK III Containments to Early Failure from Hydrogen Combustion During a Severe Accident	05/2001	RES	This issue was identified with the issuance of NUREG/CR-6427, "Assessment of the Direct Containment Heat (DCH) Issue for Plants with Ice Condenser Containments," when it was discovered that the early containment failure probability in ice condensers is dominated by non-DCH hydrogen combustion events. The issue was extended to include BWR MARK III containments since their relatively low free volume and strength are comparable to PWR ice condensers. The staff briefed the ACRS on the technical assessment on June 6, 2002, and is working to resolve the issue on an expedited schedule, as directed by the Commission. Completion of the technical assessment of the GSI is scheduled for December 2002.
191	Assessment of Debris Accumulation on PWR Sump Performance	09/1996	NRR	This issue addressed the possibility of debris accumulating on the emergency core cooling system (ECCS) sump screen, resulting in the loss of net positive suction head margin (NPSH). This loss of NPSH could impede or prevent the flow of water from the sump necessary to meet the criteria of 10 CFR 50.46. A technical assessment, completed in September 2001, concluded that additional actions may be warranted to ensure an adequate NPSH margin for PWR ECCS pumps taking suction from containment sumps. The PWR industry, with NRC oversight, is developing technical guidance for plant-specific analyses to determine whether debris accumulation will impede or prevent ECCS operation. Final closure of this GSI, which will include staff verification of any needed corrective actions, is scheduled for March 2007.

Open GSIs as of June 27, 2002

GSI Number	Title	Identification Date	Lead Office	Status
NMSS-7	Criticality Benchmarks Greater than 5% Enrichment	05/1998	NMSS	The staff is developing and confirming the adequacy of tools for validating criticality calculations, including requests to process higher enrichments, to be used in licensing nuclear facilities. Resolution is scheduled for June 2004.
NMSS-14	Surety Estimates for Groundwater Restoration at In-Situ Leach Facilities	06/1998	NMSS	This issue addresses the development of methodologies to (1) calculate surety for ground-water restoration activities at in situ leach uranium extraction facilities and (2) monitor post-restoration ground-water quality stability. Resolution is scheduled for September 2002.
NMSS-16	Adequacy of 0.05 Weight Percent Limit in Part 40	06/1998	NMSS	This issue involves two actions: (1) jurisdictional and technical issues regarding the regulation of source material and (2) transfer from licensees of source material less than 0.05 percent weight concentration to persons exempt under 10 CFR 40.13(a). Options on how to proceed with jurisdictional and technical issues on the regulation of source material is part of the activities of the Part 40 Jurisdictional Working Group. A status report was provided to the Commission in March 2001 (SECY-01-0051). The staff anticipates providing formal recommendations early 2003. The transfer provision rule, as discussed in SECY-00-0201 (September 2000), is expected to be published as a proposed rule in August 2002.