

POLICY ISSUE INFORMATION

July 27, 2001

SECY-01-0139

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 this SRM, the Commission directed the staff to provide an annual summary of activities related to open reactor and non-reactor GSIs.

The current structure of the reactor Generic Issues Program was established in the early 1980s and was intended to address the resolution of reactor GSIs and environmental issues, improvement in the licensing process, and the elimination of requirements that are overly conservative or unnecessarily restrictive or costly. GSIs originate from operational events or from concerns with the adequacy of existing regulations. The NRC process for addressing reactor generic issues was approved by the Commission in 1983 and is delineated in NUREG-0933, "A Prioritization of Generic Safety Issues."

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Up to 1995, the Generic Issues Program focused only on GSIs related to nuclear power plants. However, following a December 19, 1995, Commission briefing on mechanisms for addressing GSIs, the staff was requested to expand the program to include non-reactor GSIs identified by the Office of Nuclear Material Safety and Safeguards (NMSS). In October 1997, a process for addressing non-reactor generic issues from all sources, operational and non-operational, was developed by NMSS and documented in NMSS Policy and Procedures Letter 1-57, Rev. 1.

In addition to the processes documented in NUREG-0933 and NMSS Policy and Procedures Letter 1-57, Management Directive (MD) 8.5, "Operational Safety Data Review," addresses the roles of each affected office in the identification of generic issues resulting from the review of operational data.

In 1998, the staff conducted a self-assessment of the generic issues processes and recommended changes to improve efficiency, timeliness, and clarity. The proposed changes include: (1) initial screening and technical screening steps, in which a determination will be made to either continue work on an issue or drop it; (2) a technical assessment step, in which a solution will be pursued; and (3) a regulation and guidance development step, in which changes to existing regulations will be made. A new MD 6.4, "Generic Issue Program," was developed by the staff to institute these changes. The revised process will address adequate protection issues, substantial safety enhancement, and unnecessary burden reduction initiatives. The staff is performing a trial application of this new process, as recommended by the Advisory Committee on Reactor Safeguards (ACRS), and GSIs identified after March 1999 are being evaluated with the proposed revised process. A progress report on the staff's implementation of the revised process and its findings was given to the ACRS on March 1, 2001, and MD 6.4 is expected to be issued by the end of 2001.

DISCUSSION:

RES is responsible for: (1) prioritizing and resolving GSIs through the conduct of research; (2) tracking the status of all generic issues through the identification, prioritization, and resolution steps in the agency-wide Generic Issue Management Control System (GIMCS), which is published quarterly; and (3) documenting the prioritization and resolution results in NUREG-0933, and making the information publicly available on the NRC Website (<http://www.nrc.gov/NRC/NUREGS/SR0933/index.html>). With the ongoing trial use of the MD 6.4 process, RES is also responsible for screening GSIs and documenting the results for publication in NUREG-0933.

Reactor GSIs

Reactor GSIs currently scheduled for resolution were evaluated under the original process for addressing reactor GSIs delineated in NUREG-0933. This process, as explained below, consists of six steps: identification, prioritization, resolution, imposition, implementation, and verification. Generally, safety 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 a GSI is identified, it is prioritized to determine the rank and whether resources should be expended in pursuit of a resolution. GSIs associated with nuclear reactor power plants are prioritized by the Office of Nuclear Regulatory Research (RES) using the methodology of NUREG-0933. The prioritization step is generally completed with a quantitative analysis of the risk reduction potential of the issue and a priority ranking of HIGH, MEDIUM, LOW, or DROP.

GSI with priority rankings of HIGH or MEDIUM have the potential for meeting the adequate protection or substantial safety enhancement provisions of 10 CFR 50.109 and are selected for resolution. No additional action is taken on reactor GSIs in the LOW-priority and DROP categories because of their low safety significance. All GSIs identified before March 1999 continue to be evaluated in accordance with the original process.

Upon completion of the prioritization step, all reactor GSIs that have the potential for increasing safety, either through adequate protection or substantial safety enhancement, are assigned for resolution by the RES Director. The majority of these assignments are made to RES, however, the Office of Nuclear Reactor Regulation (NRR) is assigned those reactor GSIs that require extensive interface with operating plants. Resolution of a reactor GSI requires a cost-benefit analysis of a proposed solution after consideration of the options to improve safety. Some action is taken on those GSIs for which the cost-benefit analyses show that "the direct and indirect costs are justified in view of this increased protection" (10 CFR 50.109). The ACRS normally reviews the prioritization and resolution of GSIs associated with nuclear power plants. The schedules for the resolution of GSIs allow adequate time for ACRS review and resolution of ACRS comments.

In the imposition step, the staff determines the appropriate regulatory mechanism for implementing the generic issue resolution (e.g., a rule, policy, regulatory guide, generic letter, bulletin, industry initiative, and/or licensing guidance developed during the resolution stage). Implementation covers the step in which the affected licensees perform actions on their operating plants to satisfy the commitments made during the imposition step. Finally, verification is accomplished by NRC inspection of licensee actions.

In addition to being responsible for resolving some GSIs, NRR is also responsible for managing the imposition, implementation, and verification steps for those GSIs that result in new requirements. Tracking GSIs through these final three steps is accomplished by NRR with the Safety Issues Management System (SIMS).

The following is a summary of the activities related to reactor GSIs since the last report to the Commission in SECY-00-0149 on June 30, 2000.

C Two new GSIs were identified for initial screening:

- 188 Steam Generator Tube Leaks/Ruptures Concurrent With Containment Bypass
- 189 Susceptibility of MARK III and Ice Condenser Containments to Early Failure from Hydrogen Combustion.

These two GSIs are being processed in accordance with the Draft MD 6.4 and are scheduled to complete initial screening by December 2001.

- C Initial screening of one GSI was completed in accordance with the Draft MD 6.4 and the issue was dropped (Attachment 1):
 - 187 The Potential Impact of Postulated Cesium Concentration on Equipment Qualification in the Containment Sump
- C Two GSIs were prioritized (Attachment 1):
 - 71 Failure of Resin Demineralizer Systems and Their Effects on Nuclear Power Plant Safety (DROP)
 - 185 Control of Reactivity Following Small-Break LOCAs in PWRs (HIGH)
- C Two GSIs were closed out with no new or revised requirements for licensees (Attachment 1):
 - 152 Design Basis for Valves That Might Be Subjected to Significant Blowdown Loads
 - 170 Reactivity Transients and Fuel Damage Criteria for High Burnup Fuel

Since the inception of the generic issues program in 1976, 831 of the 841 reactor issues identified have been closed out. Schedules for the resolution of the seven HIGH-priority reactor GSIs are listed in Attachment 2 and the remaining three issues are undergoing screening.

Non-Reactor GSIs

NMSS is responsible for managing non-reactor GSIs in accordance with the guidelines of the Draft MD 6.4 for newly identified issues, and NMSS Policy and Procedures Letter 1-57, Rev. 1, for issues identified before March 1999. 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-00-0149:

- C Six new GSIs were identified, and initial and technical screenings were completed on these issues in accordance with the Draft MD 6.4:
 - 17 Misleading Marketing Information to General Licensees
 - 18 Problems Encountered When Manually Editing Treatment Planning Data on Nucletron Microselectron-HDR Model 105.999
 - 19 Control Unit Failures of Classic Nucletron HDR Units
 - 20 Leaking Pools
 - 21 Unlikely Events
 - 22 Gamma Stereotactic Radiosurgery

Three of these GSIs were dropped from the Generic Issues Program: NMSS-20, -21, and -22 (Attachment 1).

- C Three GSIs were resolved with no new or revised requirements for licensees: NMSS-17, -18, -19 (Attachment 1). Currently, four non-reactor GSIs remain to be resolved and the schedules for the resolution of these issues are listed in Attachment 2.

Assessment of Processes

In the past 12 months, NMSS, NRR, and RES continued to use the revised process delineated in Draft MD 6.4 to identify and screen GSIs. The ACRS was briefed on the staff's progress in implementing the revised process and ACRS comments have been incorporated. Consistent with the ACRS recommendation, the staff will continue to implement a trial application of the new directive until the new MD 6.4 is issued.

CONCLUSION:

Since the last report to the Commission on June 30, 2000, the staff closed out two reactor and six non-reactor GSIs. The staff will continue to use the processes of the Draft MD 6.4, MD 8.5, NUREG-0933, and NMSS Policy and Procedures Letter 1-57, Rev. 1, to identify, screen, and resolve reactor and non-reactor GSIs until the new process delineated in MD 6.4 is approved. 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 Prioritized and Closed since June 30, 2000
2. Unresolved GSIs as of June 30, 2001

GSIs Prioritized and Closed Since June 30, 2000

GSI Number	Title	Identification Date	Priority	Lead Office	Status
71	Failure of Resin Demineralizer Systems and Their Effects on Nuclear Power Plant Safety	04/1996	DROP	RES	This GSI was originally given a LOW priority in 1993 but was reevaluated after a periodic review of all LOW-priority GSIs produced new information in 1996 that warranted a reassessment of the issue. The safety concerns were: (1) introduction of resin or gas into a system which subsequently causes one or more immediate failures of the safety system; and (2) loss of water chemistry control which can affect corrosion rates. The staff's evaluation, which was completed in December 2000, showed low safety significance and the issue was excluded from further consideration in accordance with the guidelines of NUREG-0933.
152	Design Basis for Valves That Might Be Subjected to Significant Blowdown Loads	04/1996	CLOSED	RES	This GSI was originally given a LOW priority in 1993 but was reevaluated after a periodic review of all LOW-priority GSIs produced new information in 1996 that warranted a reassessment of the issue. The safety concern was whether valves were designed to operate under high energy line break conditions. The issue was closed out in April 2001 after NRC inspections confirmed licensee verification of the capability of safety-related MOVs to operate within their design bases against the pressure differential generated by a full pipe diameter break. The closure of the GSI was reviewed by the ACRS.
170	Reactivity Transients and Fuel Damage Criteria for High Burnup Fuel	01/1995	CLOSED	RES	This HIGH-priority issue was closed in May 2001 with no additional regulatory requirements. The staff performed an evaluation of data that had been collected since identification of the issue and confirmed that the use of fuel up to the existing burnup limits does not pose safety concerns. The staff's conclusion was reviewed by the ACRS.

GSIs Prioritized and Closed Since June 30, 2000

GSI Number	Title	Identification Date	Priority	Lead Office	Status
185	Control of Recriticality Following Small-Break LOCA in PWRs	01/1999	HIGH	RES	The issue was prioritized in July 2000. It addresses those 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. (See Attachment 2 for Resolution Schedule.)
187	The Potential Impact of Postulated Cesium Concentration on Equipment Qualification in the Containment Sump	12/1999	DROP	RES	This issue addressed the question of whether licensees should use the alternative source term (AST) in evaluating the design basis for equipment qualification. The issue was raised after it was found that integrated sump doses from the gap and in-vessel releases were higher with the use of the AST when compared to the Technical Information Document (TID) 14844. The issue was processed in accordance with the Draft MD 6.4 and was dropped in April 2001 during initial screening when it was concluded that the safety concern was addressed by compliance with existing regulations.
NMSS-17	Misleading Marketing Information to General Licensees	07/2000	CLOSED	NMSS	This issue was identified when it was found that licensed devices containing radioactive materials have not always been handled or disposed of properly, particularly those authorized by general licenses. This practice has resulted in radiation exposure to the public on some occasions and subsequent costly decontamination of property. NRC inspections of licensees indicated that some manufacturers and distributors did not completely understand the regulations and their responsibilities. The issue was closed in July 2000 with a revision to 10 CFR 32 that requires distributors to provide information on radioactive materials to licensees prior to, instead of at the time of, their transfer.

GSIs Prioritized and Closed Since June 30, 2000

GSI Number	Title	Identification Date	Priority	Lead Office	Status
NMSS-18	Problems Encountered When Manually Editing Treatment Planning Data on Nucletron Microselectron-HDR Model 105.999	03/1999	CLOSED	NMSS	This issue arose from two misadministrations when a licensee manually edited treatment data for a Nucletron High Dose Rate (HDR) unit; while attempting to edit one parameter, unintended and unnoticed changes to the source step size occurred. The staff identified the source of the problem to be the manufacturer's software. The issue was closed in August 2000 when the staff verified that the manufacturer's software was modified.
NMSS-19	Control Unit Failures of Classic Nucletron HDR Units	07/1999	CLOSED	NMSS	This issue was identified when nine control unit failures in Nucletron Classic Model HDR units occurred over a three-year period: two in 1997; four in 1998; and three in 1999. The issue was closed in November 2000 when the staff's analysis showed that the failures were of low safety significance. Additional staff follow-up of Nucletron corrective measures were deemed unnecessary.
NMSS-20	Leaking Pools	11/2000	DROP	NMSS	This issue was identified in September 2000 when a licensee reported a water leak in the cask handling area pool used to store irradiated commercial reactor hardware and irradiated fuel rods. The average concentrations of radionuclides leaking from the pool significantly exceeded the limits in 10 CFR 20, Appendix B, Table 2, for effluent releases to unrestricted areas. The issue was dropped in January 2001 when the staff determined that the risks associated with not monitoring pools for leakage are very low. This conclusion was based on the adequacy of the physical barriers that must be overcome in order for material to escape the pool and reach unrestricted areas.

GSIs Prioritized and Closed Since June 30, 2000

GSI Number	Title	Identification Date	Priority	Lead Office	Status
NMSS-21	Unlikely Events	11/2000	DROP	NMSS	This issue was identified after inspections of gaseous diffusion plants revealed that ANSI/ANS-8.1-1983, "Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors," was not being applied properly to unlikely events. The standard states that criticality safety is achieved by controlling certain parameters within sub-critical limits. Since existing regulations require fuel cycle facilities to have nuclear criticality safety programs, the staff concluded that the issue was of low safety significance, and it was dropped in January 2001.
NMSS-22	Gamma Stereotactic Radiosurgery	01/2001	DROP	NMSS	In July 2000, a medical misadministration occurred during gamma stereotactic radiosurgery when an erroneous coordinate setting resulted in an unintended site of a brain receiving 10 gray. The affected licensee's procedure to independently verify the coordinate setting also failed to identify the error prior to treatment. A staff examination of existing operating data related to gamma stereotactic radiosurgery revealed that the frequency of coordinate setting errors is low, and the probability that an erroneous setting will result in health effects is also low. The staff concluded that existing regulations were adequate and the issue was dropped in February 2001.

Unresolved GSIs as of June 30, 2001

GSI Number	Title	Identification Date	Priority	Lead Office	Status
156.6.1	Pipe Break Effects on Systems and Components	02/1991	HIGH	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. This study was completed in 1999 and showed the issue to be of high priority. As a result, a Task Action Plan for resolving the issue was developed in May 2001.
163	Multiple Steam Generator Tube Leakage	06/1992	HIGH	NRR	This issue addresses the safety concern associated with multiple steam generator tube leaks during a main steam line break that cannot be isolated. At the request of the EDO, the ACRS served as an ad hoc panel and issued its findings and recommendations to the EDO in NUREG-1470. The Action Plan for resolving the issue was developed by NRR and RES in May 2001. This plan encompasses several complex technical sub-issues with milestones that are scheduled for completion beginning in FY-2001. Close-out of the issue is scheduled for September 2005.
168	Environmental Qualification of Electrical Equipment	04/1993	HIGH	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. LOCA tests were completed in April 2000 and a two-volume report on the assessment of environmental qualification practices and condition monitoring techniques for low voltage electric cables was issued in NUREG/CR-6704 in February 2001. The staff is exploring voluntary industry initiatives to resolve the issue.

Unresolved GSIs as of June 30, 2001

GSI Number	Title	Identification Date	Priority	Lead Office	Status
172	Multiple System Responses Program (MSRP)	10/1989	HIGH	RES	This issue contains 21 sub-issues that were raised by the ACRS following the staff's assumptions and limitation of work during the resolution of USIs A-17, A-45, and A-47. The staff completed an evaluation of all sub-issues in 1995 and concluded that 10 were to be dropped and 11 were to be addressed in the IPE/IPEEE programs. Work performed by the industry is being reviewed to determine whether it adequately addresses the issue without new or revised requirements. A draft report (NUREG-1742) on how the MSRP issues were addressed by licensees in their IPEEEs was issued in April 2001. Closure is scheduled for February 2002.
173.A	Spent Fuel Storage Pool: Operating Facilities	02/1996	HIGH	NRR	This issue addresses the potential for the sustained loss of spent fuel pool cooling capability. In July 2000, the ACRS recommended that the staff evaluate the report on spent fuel pools (SFP) at decommissioning plants and consider its applicability to the SFPs at operating plants. The report (NUREG-1738) was issued in February 2001 and a public meeting was held in February 2001. The staff will determine whether regulatory analysis screening criteria need to be developed for SFP accidents at operating plants. Closure is scheduled for October 2001.
185	Control of Recriticality Following Small-Break LOCA in PWRs	01/1999	HIGH	RES	A description of this issue is given in Attachment 1. An action plan for resolving the issue was approved in March 2001. A closure date is under development.
191	Assessment of Debris Accumulation on PWR Sump Performance	09/1996	HIGH	RES	Development of a technical basis for a possible resolution involves a long-term research effort on coatings and debris transport to determine the potential severity of PWR sump blockage effects. In 1999, collection and review of PWR containment sump design and operational data was completed. Closure is scheduled for September 2001.

Unresolved GSIs as of June 30, 2001

GSI Number	Title	Identification Date	Priority	Lead Office	Status
NMSS-7	Criticality Benchmarks Greater than 5% Enrichment	05/1998	HIGH	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. Closure is scheduled for June 2004.
NMSS-10	Troxler Gauge Source Rod Weld Failures	05/1998	MEDIUM	NMSS	The staff will work with the Agreement State of North Carolina to ensure that cracked source rods on Troxler moisture density gauges are repaired or replaced, and ensure the manufacturing process is reviewed/modified to reduce the potential for recurrence. Closure is scheduled for October 2001.
NMSS-14	Surety Estimates for Groundwater Restoration at In-Situ Leach Facilities	06/1998	MEDIUM	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. Closure is scheduled for September 2002.
NMSS-16	Adequacy of 0.05 Weight Percent Limit in Part 40	06/1998	MEDIUM	NMSS	The staff will determine whether the limit on "unimportant quantities" of source material adequately protects public health and safety. Options on how to proceed with jurisdictional and technical issues on the regulation of source material were forwarded to the Commission in SECY-00-0201 in September 2000. Closure is scheduled for December 2001.