

POLICY ISSUE INFORMATION

August 24, 2004

SECY-04-0154

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations

SUBJECT: ISSUANCE OF NUCLEAR REGULATORY COMMISSION GENERIC LETTER 2004-XX, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS"

PURPOSE:

To inform the Commission of the staff's intent to issue the subject generic letter. A copy of the proposed generic letter is provided as Attachment 1.

SUMMARY:

The generic letter asks licensees of pressurized-water nuclear power reactors to perform an evaluation and provide information to enable the NRC to verify whether licensees can demonstrate that their emergency core cooling systems (ECCS) and containment spray systems (CSS) are capable of performing their intended post-accident mitigating functions following a design basis accident requiring recirculation operation. The staff intends to issue the subject generic letter approximately ten working days after the date of this information paper.

BACKGROUND:

In 1979, as a result of evolving staff concerns about the adequacy of pressurized-water reactor (PWR) recirculation sump designs, the NRC opened Unresolved Safety Issue (USI) A-43, "Containment Emergency Sump Performance." Through the resolution of USI A-43, the staff found that the 50 percent blockage assumption (under which most nuclear power plants had

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been licensed) identified in Regulatory Guide (RG) 1.82, Revision 0, "Sumps for Emergency Core Cooling and Containment Spray Systems," dated June 1974, should be replaced with more comprehensive guidance. This guidance would ensure that an assessment of debris blockage effects be performed on a plant-specific basis to ensure that the functionality of the ECCS and CSS design features are maintained.

In response to events at boiling-water reactor (BWR) facilities that challenged the conclusion that no new requirements were necessary to prevent clogging of ECCS strainers at operating BWRs, the NRC issued several bulletins to address this issue. On the basis of the BWR licensees' implementation of appropriate procedural measures, maintenance practices, and plant modifications to minimize the potential for debris accumulation to clog the ECCS suction strainers following a LOCA, the NRC staff concluded that all BWR licensees had sufficiently addressed the bulletins.

Although this issue was resolved at BWR facilities, the research conducted at the time raised questions concerning the adequacy of PWR sump designs to prevent clogging. These questions pertained to the quantities of generated debris, the composition and transportability of debris, and the potential for a combination of different debris sources to create substantially greater head loss than a comparable single debris source. These findings prompted the NRC to open Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR Sump Performance." On the basis of the information acquired during its efforts to resolve GSI-191, the staff determined that the guidance used to develop current licensing basis analyses does not adequately and completely model sump screen blockage and related effects.

On June 9, 2003, the NRC issued Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized-Water Reactors." The bulletin requested PWR licensees to either (1) state their compliance on a mechanistic basis with regulatory requirements applicable to the ECCS and CSS recirculation functions, or (2) describe any interim compensatory measures that they had implemented or would implement to reduce risk. In developing Bulletin 2003-01, the NRC staff recognized that it may be necessary for addressees to undertake complex evaluations to determine whether regulatory compliance exists in light of the concerns identified in the bulletin and that the methodology needed to perform these evaluations was not currently available. As a result, that information was not requested in the bulletin, but addressees were informed that the staff was preparing a generic letter that would request this information. This generic letter is the follow-on to the bulletin.

DISCUSSION:

After the bulletin was issued, the staff developed a new revision (Revision 3) of RG 1.82, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," dated November 2003, to provide a methodology to evaluate debris blockage effects on a plant-specific basis. The generic letter requests that the addressees perform a new, more realistic analysis using an NRC-approved methodology and confirm the functionality of the ECCS and CSS during design basis accidents requiring containment sump recirculation. To assist in determining, on a plant-specific basis, the impact on sump screen performance and other related effects of extended post-accident operation with debris-laden fluids, addressees may use the guidance in RG 1.82, Revision 3. In addition, the NRC staff is currently reviewing

evaluation guidance developed by the industry. The NRC staff intends to document its review in a safety evaluation, which licensees can reference as regulatory guidance. This evaluation contains, in part, risk-informed approaches as discussed in SECY-04-0150, dated August 16, 2004 (ADAMS Accession No. ML041660473). Individual addressees may also develop an alternative to the approaches discussed in this paragraph for responding to the generic letter; however, this may require additional staff review to assess the adequacy of such approaches.

The generic letter requests that addressees provide, within 90 days of the issuance of the NRC safety evaluation, a description of their planned actions and schedule for completion of the requested evaluation. This description should include details of the methodology that the addressee used or will use to analyze the susceptibility of the ECCS and CSS recirculation functions to the adverse effects identified within the generic letter, as well as the completion date for the analysis, if appropriate.

In addition, no later than September 1, 2005, the generic letter requests that addressees provide: (1) Information to confirm that the ECCS and CSS recirculation functions under debris-loading conditions are or will be in compliance with the applicable regulatory requirements, (2) A general description and implementation schedule for all corrective actions, (3) A description of the methodology the addressee used to perform the analysis, (4) A description of specific plant design features associated with sump recirculation, (5) A description of licensing basis changes, and (6) A description of any existing or planned programmatic controls to restrict potential sources of debris introduced into containment. The staff requires that the addressees submit their written responses in accordance with 10 CFR 50.54(f).

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, 10 CFR 50.109(a)(4)(i) and 10CFR 50.54(f), this generic letter requests that addressees evaluate their facilities to confirm compliance with the existing applicable regulatory requirements as outlined in this generic letter. This generic letter also transmits an information request for the purpose of verifying compliance with existing applicable regulatory requirements. The staff has determined that, in light of the information identified during the efforts to resolve GSI-191, the previous guidance used to develop most addressees' current licensing basis analyses does not adequately and completely model sump screen debris blockage and related effects. Due to the deficiencies in the previous guidance, a potential analytical error could have been introduced which would result in ECCS and CSS performance that does not conform with existing applicable regulatory requirements. In response, the staff revised its guidance for determining the susceptibility of PWR recirculation sump screens to the adverse effects of debris blockage during design basis accidents requiring recirculation operation of the ECCS or CSS to ensure compliance with existing applicable regulatory requirements. Thus, the information requested by this generic letter is considered a compliance exception to the rule in accordance with 10 CFR 50.109(a)(4)(i).

The NRC staff has assessed whether existing PWRs should continue operation while responding to the subject generic letter [in light of the GSI-191 resolution schedule, proposed through December 31, 2007, as mentioned above,] and determined that continued operation is justified because the probability of an initiating event is extremely low, certain existing design features tend to prevent flow blockage to the ECCS sump, and sources of margin in PWR designs exist which are not always credited in the licensing basis for each plant. The basis for this evaluation was documented in "Justification for Continued Operation from April 2001, NRR Director's Quarterly Status Report", dated August 14, 2001, which was made publicly available

through a meeting summary (ADAMS Accession Number ML012270168). Additionally, by implementing interim compensatory measures, such as those that were requested by NRC Bulletin 2003-01, (e.g., alternate water sources or refilling the refueling water storage tank (RWST)), licensees have enhanced safety by improving guidance for successful operator recovery actions. The staff has also determined that addressees are not required to be in compliance with the newly issued analysis using a NRC-approved methodology, until after all plant modifications (if required) are completed in accordance with the resolution schedule, and addressees have changed their licensing basis, as appropriate. However, if a non-compliance with the existing licensing design basis that affects the operability of an ECCS or CSS design feature is identified while taking actions in response to the generic letter, addressees should comply with established regulatory requirements.

The NRC has developed a Web page to keep the public informed of generic activities on PWR sump performance at (<http://www.nrc.gov/reactors/operating/ops-experience/pwr-sump-performance.html>). This page provides links to information on PWR sump performance issues, along with documentation of NRC interactions with industry (industry submittals, meeting notices, presentation materials, and meeting summaries). The NRC will continue to update this Web page as new information becomes available. In addition, the staff incorporated public comments from the issued draft generic letter as shown in Attachment 2. These measures are intended to increase the openness and communications to the stakeholder.

COORDINATION:

The Advisory Committee on Reactor Safeguards reviewed the generic letter during its 514th meeting on July 7, 2004, and recommended that it be issued. The Committee to Review Generic Requirements (CRGR) reviewed and endorsed the generic letter during its 397th meeting on August 10, 2004. The staff incorporated the CRGR comments from this meeting.

The Office of the General Counsel reviewed the subject generic letter and had no legal objections to its content. In addition, the Office of the Chief Financial Officer (OCFO) determined that a review of the generic letter was unnecessary; therefore, OCFO stated no objections based on budget or financial management concerns, or potential resource impacts.

The subject generic letter is a “rule” under the Small Business Regulatory Enforcement Fairness Act of 1996, and the Office of Management and Budget has determined it to be a “non-major” rule.

/RA/

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Attachments:

1. NRC Generic Letter 2004-XX, Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors
2. Public Comment Table

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, DC 20555

NRC GENERIC LETTER 2004-XX: POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON
EMERGENCY RECIRCULATION DURING DESIGN
BASIS ACCIDENTS AT PRESSURIZED-WATER
REACTORS

Addressees

All holders of operating licenses for pressurized-water nuclear power reactors, except those who have ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose

The U.S. Nuclear Regulatory Commission (NRC) is issuing this generic letter to:

- (1) Request that addressees perform an evaluation of the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions in light of the information provided in this letter and, if appropriate, take additional actions to ensure system function. Additionally, addressees are requested to submit the information specified in this letter to the NRC. This request is based on the identified potential susceptibility of pressurized-water reactor (PWR) recirculation sump screens to debris blockage during design basis accidents requiring recirculation operation of ECCS or CSS and on the potential for additional adverse effects due to debris blockage of flowpaths necessary for ECCS and CSS recirculation and containment drainage.
- (2) Require addressees to provide the NRC a written response in accordance with 10 CFR 50.54(f).

Background

In 1979, as a result of evolving staff concerns related to the adequacy of PWR recirculation sump designs, the NRC opened Unresolved Safety Issue (USI) A-43, "Containment Emergency Sump Performance." To support the resolution of USI A-43, the NRC undertook an extensive research program, the technical findings of which are summarized in NUREG-0897, "Containment Emergency Sump Performance," dated October 1985. The resolution of USI A-43 was subsequently documented in Generic Letter (GL) 85-22, "Potential for Loss of

Post-LOCA Recirculation Capability Due to Insulation Debris Blockage,” dated December 3, 1985. Although the staff’s regulatory analysis concerning USI A-43 did not support imposing new sump performance requirements upon licensees of operating PWRs or boiling-water reactors (BWRs), the staff found in GL 85-22 that the 50-percent blockage assumption (under which most nuclear power plants had been licensed) identified in Regulatory Guide (RG) 1.82, Sumps for Emergency Core Cooling and Containment Spray Systems, Revision 0 should be replaced with a more comprehensive requirement to assess debris effects on a plant-specific basis. The 50-percent screen blockage assumption does not require a plant-specific evaluation of the debris-blockage potential and may result in a nonconservative analysis for screen blockage effects. The staff also updated the NRC’s regulatory guidance, including Section 6.2.2 of the Standard Review Plan (NUREG-0800) and RG 1.82 to reflect the USI A-43 technical findings documented in NUREG-0897.

Following the resolution of USI A-43 in 1985, several events challenged the conclusion that no new requirements were necessary to prevent the clogging of ECCS strainers at operating BWRs:

- On July 28, 1992, at Barsebäck Unit 2, a Swedish BWR, the spurious opening of a pilot-operated relief valve led to the plugging of two containment vessel spray system suction strainers with mineral wool and required operators to shut down the spray pumps and backflush the strainers.
- In 1993, at Perry Unit 1, two events occurred during which ECCS strainers became plugged with debris. On January 16, ECCS strainers were plugged with suppression pool particulate matter, and on April 14, an ECCS strainer was plugged with glass fiber from ventilation filters that had fallen into the suppression pool. On both occasions, the affected ECCS strainers were deformed by excessive differential pressure created by the debris plugging.
- On September 11, 1995, at Limerick Unit 1, following a manual scram due to a stuck-open safety/relief valve, operators observed fluctuating flow and pump motor current on the A loop of suppression pool cooling. The licensee later attributed these indications to a thin mat of fiber and sludge which had accumulated on the suction strainer.

In response to these ECCS suction strainer plugging events, the NRC issued several generic communications, including Bulletin 93-02, Supplement 1, “Debris Plugging of Emergency Core Cooling Suction Strainers,” dated February 18, 1994; Bulletin 95-02, “Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode,” dated October 17, 1995; and, Bulletin 96-03, “Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling-Water Reactors,” dated May 6, 1996. These bulletins requested that BWR licensees implement appropriate procedural measures, maintenance practices, and plant modifications to minimize the potential for the clogging of ECCS suction strainers by debris accumulation following a loss-of-coolant accident (LOCA). The NRC staff has concluded that all BWR licensees have sufficiently addressed these bulletins.

However, findings from research to resolve the BWR strainer clogging issue raised questions concerning the adequacy of PWR sump designs. In comparison to the technical findings of the earlier USI A-43 research program on PWRs, the BWR research findings demonstrated that the amount of debris generated by a high-energy line break (HELB) could be greater, that the debris could be finer (and thus more easily transportable), and that certain combinations of debris (e.g., fibrous material plus particulate material) could result in a substantially greater head loss than an equivalent amount of either type of debris alone. These research findings prompted the NRC to open Generic Safety Issue (GSI) 191, "Assessment of Debris Accumulation on PWR Sump Performance." The objective of GSI-191 is to ensure that post-accident debris blockage will not impede or prevent the operation of the ECCS and CSS in recirculation mode at PWRs during LOCAs or other HELB accidents for which sump recirculation is required.

On June 9, 2003, having completed its technical assessment of GSI-191 (summarized below in the Discussion section of this generic letter), the NRC issued Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized-Water Reactors." As a result of the emergent issues discussed therein, the bulletin requested an expedited response from PWR licensees on the status of their compliance on a mechanistic basis with regulatory requirements concerning the ECCS and CSS recirculation functions. Addressees who chose not to confirm regulatory compliance were asked to describe any interim compensatory measures that have been implemented or will be implemented to reduce risk until the analysis could be completed. All licensees have since responded to Bulletin 2003-01. In developing Bulletin 2003-01, the NRC staff recognized that it may be necessary for addressees to undertake complex evaluations to determine whether regulatory compliance exists in light of the concerns identified in the bulletin and that the methodology needed to perform these evaluations was not currently available. As a result, that information was not requested in the bulletin, but addressees were informed that the staff was preparing a generic letter that would request this information. This generic letter is the follow-on to the bulletin.

In response to Bulletin 2003-01, PWR licensees that chose not to confirm regulatory compliance implemented or planned to implement compensatory measures to reduce risk or otherwise enhance the capability of the ECCS and CSS recirculation functions. Addressees' understanding of their facilities' ECCS and CSS recirculation capabilities may change when they resolve the potential concerns identified in this generic letter, and revise their analyses of sump performance. Therefore, addressees may find it necessary to reevaluate the adequacy of their compensatory measures in light of the new information and take further action as appropriate and necessary. Upon resolution of the potential concerns identified in this generic letter and the completion of any corrective actions resulting from that resolution, addressees may consider continuing, revising, or retiring their compensatory measures as appropriate.

The NRC has developed a Web page to keep the public informed of generic activities on PWR sump performance at (<http://www.nrc.gov/reactors/operating/ops-experience/pwr-sump-performance.html>). This page provides links to information on PWR sump performance issues, along with documentation of NRC interactions with industry (industry submittals, meeting notices, presentation materials, and meeting summaries). The NRC will continue to update this Web page as new information becomes available.

Discussion

In the event of an HELB inside the containment of a PWR, energetic pressure waves and fluid jets would impinge upon materials in the vicinity of the break, such as thermal insulation, coatings, and concrete, damaging and dislodging them. Debris could also be generated through secondary mechanisms, such as severe post-accident temperature and humidity conditions, flooding of the lower containment, and the impact of containment spray droplets. In addition to debris generated by jet forces from the pipe rupture, debris could be created by the chemical reaction between the materials in containment and the chemically reactive spray solutions used following a LOCA. These reactions might generate additional debris such as disbonded coatings and chemical precipitants. Through transport methods such as entrainment in the steam/water flows issuing from the break and containment spray washdown, a fraction of the generated debris and foreign material in the containment would be transported to the pool of water formed on the containment floor. Subsequently, if the ECCS or CSS pumps took suction from the recirculation sump, the debris suspended in the containment pool would begin to accumulate on the sump screen or be transported through the associated system. The accumulation of this suspended debris on the sump screen could create a roughly uniform covering on the screen, referred to as a debris bed, which would tend to increase the head loss across the screen through a filtering action. If a sufficient amount of debris accumulated, the debris bed would reach a critical thickness at which the head loss across the debris bed would exceed the net positive suction head (NPSH) margin required to ensure the successful operation of the ECCS and CSS pumps in recirculation mode. A loss of NPSH margin for the ECCS or CSS pumps as a result of the accumulation of debris on the recirculation sump screen, referred to as sump clogging, could result in degraded pump performance and eventual pump failure. Debris could also plug or wear close-tolerance components within the ECCS or CSS systems. This plugging or wear might cause a component to degrade to the point where it could not perform its designated function (i.e., pump fluid, maintain system pressure, or pass and control system flow.)

The primary object of the NRC's technical assessment of GSI-191 was to assess the likelihood that the ECCS and CSS pumps at domestic PWRs would experience a debris-induced loss of NPSH margin during sump recirculation. The NRC's technical assessment culminated in a parametric study documented in Volume 1 of NUREG/CR-6762, "GSI-191 Technical Assessment: Parametric Evaluations for Pressurized Water Reactor Recirculation Sump Performance," dated August 2002. This study was a mechanistic treatment of phenomena associated with debris blockage using analytical models of domestic PWRs generated with a combination of generic and plant-specific data. The GSI-191 parametric study concluded that recirculation sump clogging was a credible concern for domestic PWRs. As a result of the limitations of plant-specific data and other modeling uncertainties, however, the parametric study did not definitively show whether particular PWR plants were vulnerable to sump clogging when phenomena associated with debris blockage were modeled mechanistically.

The methodology employed by the GSI-191 parametric study is based upon the substantial body of test data and analyses that are documented in technical reports generated during the NRC's GSI-191 research program and earlier technical reports by the NRC and the industry during the resolution of the BWR strainer clogging issue and USI A-43. Four of these NRC

technical reports on debris generation, transport, accumulation, and head loss, are incorporated by reference into the GSI-191 parametric study:

- NUREG/CR-6770, "GSI-191: Thermal-Hydraulic Response of PWR Reactor Coolant System and Containments to Selected Accident Sequences," August 2002
- NUREG/CR-6762, Vol. 3, "GSI-191 Technical Assessment: Development of Debris Generation Quantities in Support of the Parametric Evaluation," August 2002
- NUREG/CR-6762, Vol. 4, "GSI-191 Technical Assessment: Development of Debris Transport Fractions in Support of the Parametric Evaluation," August 2002
- NUREG/CR-6224, "Parametric Study of the Potential for BWR ECCS Strainer Blockage Due to LOCA-Generated Debris," October 1995

In addition to demonstrating the potential for debris to clog containment recirculation sumps, operational experience and the NRC's technical assessment of GSI-191 have also identified three integrally related modes by which post-accident debris blockage could adversely affect the sump screen's design function of intercepting debris that could impede or prevent the operation of the ECCS and CSS in recirculation mode.

First, as a result of the 50-percent blockage assumption, most PWR sump screens were designed assuming that relatively small structural loadings would result from the differential pressure associated with debris blockage. Consequently, PWR sump screens may not be capable of accommodating the increased structural loadings that would occur due to mechanistically determined debris beds that cover essentially the entire screen surface. Inadequate structural reinforcement of a sump screen may result in its deformation, damage, or failure, which could allow large quantities of debris to be ingested into the ECCS and CSS piping, pumps, and other components, potentially leading to their clogging or failure. The credibility of this concern for screens and strainers that have not been designed with adequate reinforcement was shown by the ECCS strainer plugging and deformation events that occurred at Perry Unit 1 (further described in Information Notice (IN) 93-34, "Potential for Loss of Emergency Cooling Function Due to a Combination of Operational and Post-LOCA Debris in Containment," dated April 26, 1993, and License Event Report (LER) 50-440/93-011, "Excessive Strainer Differential Pressure Across the RHR Suction Strainer Could Have Compromised Long-Term Cooling During Post-LOCA Operation," submitted May 19, 1993).

Second, in some PWR containments, the flowpaths by which containment spray or break flows return to the recirculation sump may include chokepoints, where the flowpath becomes so constricted that it could become blocked with debris following an HELB. Examples of potential chokepoints are pool drains, cavities, isolated containment compartments, and constricted drainage paths between physically separated containment elevations. Debris blockage at certain chokepoints could hold up substantial amounts of water required for adequate recirculation or cause the water to be diverted into containment volumes that do not drain to the recirculation sump. The holdup or diversion of water assumed to be available to support sump recirculation could result in an available NPSH for ECCS and CSS pumps that is lower than the analyzed value, thereby reducing assurance that recirculation would successfully function. A reduced available NPSH directly concerns sump screen design because the NPSH margin of

the ECCS and CSS pumps must be conservatively calculated to determine correctly the required surface area of passive sump screens when mechanistically determined debris loadings are considered. Although the parametric study (NUREG/CR-6762, Vol. 1) did not analyze in detail the potential for the holdup or diversion of recirculation sump inventory, the NRC's GSI-191 research identified this phenomenon as an important and potentially credible concern. A number of LERs associated with this concern further confirm its credibility and potential significance:

- LER 50-369/90-012, "Loose Material Was Located in Upper Containment During Unit Operation Because of an Inappropriate Action," McGuire Unit 1, August 30, 1990
- LER 50-266/97-006, "Potential Refueling Cavity Drain Failure Could Affect Accident Mitigation," Point Beach Unit 1, February 19, 1997
- LER 50-455/97-001, "Unit 2 Containment Drain System Clogged Due to Debris," Byron Unit 2, April 17, 1997
- LER 50-269/97-010, "Inadequate Analysis of ECCS Sump Inventory Due to Inadequate Design Analysis," Oconee Unit 1, January 8, 1998
- LER 50-315/98-017, "Debris Recovered from Ice Condenser Represents Unanalyzed Condition," D.C. Cook Unit 1, July 1, 1998

Third, debris blockage at flow restrictions within the ECCS recirculation flowpath downstream of the sump screen is a potential concern for PWRs. Debris that is capable of passing through the recirculation sump screen may have the potential to become lodged at a downstream flow restriction, such as a high-pressure safety injection (HPSI) throttle valve or fuel assembly inlet debris screen. Debris blockage at such flow restrictions in the ECCS flowpath could impede or prevent the recirculation of coolant to the reactor core, thereby leading to inadequate core cooling. Similarly, debris blockage at flow restrictions in the CSS flowpath, such as a containment spray nozzle, could impede or prevent CSS recirculation, thereby leading to inadequate containment heat removal. Debris may also accumulate in close-tolerance subcomponents of pumps and valves. The effect may be either to plug the subcomponent, thereby rendering the component unable to perform its function, or to wear critical close-tolerance subcomponents to the point at which component or system operation is degraded and unable to fully perform its function. Considering the recirculation sump screen's design function of intercepting potentially harmful debris, it is essential that the screen openings be adequately sized and that the sump screen's current configuration be free of gaps or breaches which could compromise the ECCS and CSS recirculation functions. It is also essential that system components be designed and evaluated to be able to operate as necessary with debris laden fluid post-LOCA.

Section 50.46(c)(2) of Title 10 of the Code of Federal Regulations (10 CFR 50.46(c)(2)) defines an evaluation model as the calculational framework for evaluating the behavior of the reactor system during a postulated LOCA. An evaluation model includes one or more computer programs and all other information necessary for applying the calculational framework to a specific LOCA (the mathematical models used, the assumptions included in the programs, the procedure for treating the program input and output information, the parts of the analysis not

included in the computer programs, values of parameters, and all other information necessary to specify the calculational procedure). Although not traditionally considered as a component of the 10 CFR 50.46 ECCS evaluation model, the calculation of sump performance is necessary to determine if the sump and the ECCS are predicted to provide enough flow to ensure long-term cooling.

Based on the new information identified during the efforts to resolve GSI-191, the staff has determined that the previous guidance used to develop current licensing basis analyses does not adequately and completely model sump screen debris blockage and related effects. As a result, due to the deficiencies in the previous guidance, an analytical error could be introduced which results in ECCS and CSS performance that does not conform with the existing applicable regulatory requirements outlined in this generic letter. Therefore, the staff is revising the guidance for determining the susceptibility of PWR recirculation sump screens to the adverse effects of debris blockage during design basis accidents requiring recirculation operation of the ECCS or CSS. Therefore, the NRC staff determined that, in light of the revised staff guidance, it is appropriate to request that addressees perform new, more realistic analyses and submit information to confirm the functionality of the ECCS and CSS during design basis accidents requiring recirculation operations.

To assist in determining, on a plant-specific basis, the impact on sump screen performance and other related effects of extended post-accident operation with debris-laden fluids, addressees may use the guidance in Regulatory Guide (RG) 1.82, Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," dated November 2003. Revision 3 enhanced the debris blockage evaluation guidance for PWRs provided in Revision 1 of the regulatory guide to better model sump screen debris blockage and related effects. Revision 1 replaced the 50-percent blockage assumption in Revision 0 with a comprehensive, mechanistic assessment of plant-specific debris blockage potential for future modifications related to sump performance, such as thermal insulation changeouts. This was in response to the findings of USI A-43. The staff issued Revision 2 of the RG after evaluating blockage events such as the Barsebäck Unit 2 event mentioned above but for BWRs only. The NRC staff determined after the issuance of Revision 2 that research for PWRs indicated that the guidance in that revision was not comprehensive enough to ensure adequate evaluation of a PWR plant's susceptibility to the detrimental effects of debris accumulation on debris interceptors (e.g., trash racks and sump screens). This led to the issuing of Revision 3 to address the PWRs. In addition, the NRC staff is reviewing generic industry guidance and will issue a safety evaluation endorsing acceptable portions or all of the generic industry guidance. Once approved, this guidance may also be used to assist in determining the status of regulatory compliance. For areas not addressed in the industry guidance, the NRC will provide guidance in the safety evaluation. Individual addressees may also develop an alternative to the approaches mentioned in this paragraph for responding to this generic letter; however, additional staff review may be required to assess the adequacy of such approaches.

The timeframes for addressee responses in this generic letter were selected to (1) allow adequate time for addressees to perform an analysis, (2) allow addressees to properly design and install any identified modifications, (3) allow addressees adequate time to obtain NRC approval, as necessary, for any licensing basis changes, (4) allow addressees adequate time to obtain NRC approval, as necessary, for any exemption requests, and (5) allow for the closure of the generic issue in accordance with the published schedule. These timeframes are

appropriate since all addressees have responded to Bulletin 2003-01 and will, if necessary, implement compensatory measures until the issues identified in this generic letter are resolved.

The staff has assessed whether existing PWRs should continue operation while responding to this generic letter in light of the GSI-191 resolution schedule, proposed through December 31, 2007, and determined that continued operation is justified. The staff released a justification for continued operation in the "Summary of July 26-27, 2001, Meeting with Nuclear Energy Institute and Industry on ECCS Strainer Blockage in PWRs," dated August 14, 2001. Entitled the "Justification for Continued Operation from April 2001, NRR Director's Quarterly Status Report," this justification was issued to justify continued operations during the resolution of GSI-191. As discussed in this justification, continued plant operation is still justified for several reasons. First, the probability of the most severe initiating event (i.e., large and intermediate break LOCAs) is extremely low. More probable (although still low probability) small LOCAs would require less ECCS flow, take more time to use up the water inventory in the refueling water storage tank (RWST), and in some cases may not even require the use of recirculation from the ECCS sump because the flow through the break would be small enough that the operator will have sufficient time to initiate RHR operation and depressurize the reactor coolant system to terminate the loss of reactor coolant system inventory for higher elevation breaks. In addition, there are PWR design features which would tend to prevent blockage of the ECCS sumps during a LOCA. These features would tend to be effective for insulation and coating debris. For instance, the containments in PWRs tend to be very compartmentalized making the transport of debris to the sump screens more difficult. In addition, PWRs typically do not need to switch over to recirculation from the sump during a LOCA until greater than 20-30 minutes after the large break LOCA initiation and the elapsed time for all LOCAs will allow time for some of the debris to settle in other places within the containment. Coating debris, which is a major contributor to the latent debris in containment, would have a significant amount of time to settle. In addition, all PWRs have received approval by the staff for leak-before-break (LBB) credit on their largest RCS primary coolant piping. While LBB is not acceptable for demonstrating compliance with 10 CFR 50.46, it does demonstrate that LBB-qualified piping is sufficiently tough that it will most likely leak (even under safe shutdown earthquake conditions) rather than rupture. This would allow operators adequate opportunity to shut the plant down safely. Additionally, the staff notes that there are sources of margin in PWR designs which are not always credited in the licensing basis for each plant. For instance, NPSH analyses for most PWRs do not credit containment overpressure (which may be present during a LOCA). Any containment pressure greater than assumed in the NPSH analysis provides additional margin for ECCS operability during an accident. Another source of margin is that it has been shown that low pressure ECCS pumps would be able to continue operating in many cases for some time under cavitation conditions. Some licensees have vendor data demonstrating this. Such design margins such as these examples may prevent complete loss of ECCS recirculation flow or increase the time available for operator action (e.g., refilling the RWST) prior to loss of flow. Moreover, in response to Bulletin 2003-01, addressees have implemented or will implement interim compensatory measures to reduce the risk.

The staff has also determined that addressees are not required to be in compliance with the newly issued analysis using a NRC-approved methodology, until after all plant modifications (if required) are completed in accordance with the resolution schedule, and addressees have changed their licensing basis, as appropriate. However, if a non-compliance with the existing licensing design basis that affects the operability of an ECCS or CSS design feature is

identified while taking actions in response to the generic letter, addressees should comply with established regulatory requirements.

Applicable Regulatory Requirements

NRC regulations in Title 10, of the Code of Federal Regulations Section 50.46, 10 CFR 50.46, require that the ECCS have the capability to provide long-term cooling of the reactor core following a LOCA. That is, the ECCS must be able to remove decay heat, so that the core temperature is maintained at an acceptably low value for the extended period of time required by the long-lived radioactivity remaining in the core.

Similarly, for PWRs licensed to the General Design Criteria (GDCs) in Appendix A to 10 CFR Part 50, GDC 38 provides requirements for containment heat removal systems, and GDC 41 provides requirements for containment atmosphere cleanup. Many PWR licensees credit a CSS, at least in part, with performing the safety functions to satisfy these requirements, and PWRs that are not licensed to the GDCs may similarly credit a CSS to satisfy licensing basis requirements. In addition, PWR licensees may credit a CSS with reducing the accident source term to meet the limits of 10 CFR Part 100 or 10 CFR 50.67. GDC 35 is listed in 10 CFR 50.46(d) and specifies additional ECCS requirements. PWRs that are not licensed to the GDCs typically have similar requirements in their licensing basis.

Applicable Regulatory Guidance¹

Regulatory Guide 1.82, Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," November 2003.

Requested Action

All addressees are requested to take the following actions:

Using an NRC-approved methodology, perform a mechanistic evaluation of the potential for the adverse effects of post-accident debris blockage and operation with debris-laden fluids to impede or prevent the recirculation functions of the ECCS and CSS following all postulated accidents for which the recirculation of these systems is required. Individual addressees may also use alternative methodologies to those already approved by the NRC; however, additional staff review may be required to assess the adequacy of such approaches.

Implement any plant modifications that the above evaluation identifies as being necessary to ensure system functionality.

¹ The NRC staff is currently reviewing evaluation guidance developed by the industry. The NRC staff intends to document its review in a safety evaluation which licensees can reference as regulatory guidance.

Requested Information

All addressees are requested to provide the following information:

1. Within 90 days of the date of the safety evaluation report providing the guidance for performing the requested evaluation, addressees are requested to provide information regarding their planned actions and schedule to complete the requested evaluation. The information should include the following:
 - (a) A description of the methodology that is used or will be used to analyze the susceptibility of the ECCS and CSS recirculation functions for your reactor to the adverse effects identified in this generic letter of post-accident debris blockage and operation with debris-laden fluids identified in this generic letter. Provide the completion date of the analysis that will be performed.
 - (b) A statement of whether you plan to perform a containment walkdown surveillance in support of the analysis of the susceptibility of the ECCS and CSS recirculation functions to the adverse effects of debris blockage identified in this generic letter. Provide justification if no containment walkdown surveillance will be performed. If a containment walkdown surveillance will be performed, state the planned methodology to be used and the planned completion date.
2. Addressees are requested to provide the following information no later than September 1, 2005:
 - (a) Confirmation that the ECCS and CSS recirculation functions under debris loading conditions are or will be in compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this generic letter. This submittal should address the configuration of the plant that will exist once all modifications required for regulatory compliance have been made and this licensing basis has been updated to reflect the results of the analysis described above.
 - (b) A general description of and implementation schedule for all corrective actions, including any plant modifications, that you identified while responding to this generic letter. Efforts to implement the identified actions should be initiated no later than the first refueling outage starting after April 1, 2006. All actions should be completed by December 31, 2007. Provide justification for not implementing the identified actions during the first refueling outage starting after April 1, 2006. If all corrective actions will not be completed by December 31, 2007, describe how the regulatory requirements discussed in the Applicable Regulatory Requirements section will be met until the corrective actions are completed.
 - (c) A description of the methodology that was used to perform the analysis of the susceptibility of the ECCS and CSS recirculation functions to the adverse effects of post-accident debris blockage and operation with debris-laden fluids. The submittal may reference a guidance document (e.g., Regulatory Guide 1.82, Rev. 3, industry guidance) or other methodology previously submitted to the NRC.

(The submittal may also reference the response to Item 1 of the Requested Information described above. The documents to be submitted or referenced should include the results of any supporting containment walkdown surveillance performed to identify potential debris sources and other pertinent containment characteristics.)

- (d) The submittal should include, at a minimum, the following information:
- (i) The minimum available NPSH margin for the ECCS and CSS pumps with an unblocked sump screen.
 - (ii) The submerged area of the sump screen at this time and the percent of submergence of the sump screen (i.e., partial or full) at the time of the switchover to sump recirculation.
 - (iii) The maximum head loss postulated from debris accumulation on the submerged sump screen, and a description of the primary constituents of the debris bed that result in this head loss. In addition to debris generated by jet forces from the pipe rupture, debris created by the resulting containment environment (thermal and chemical) and CSS washdown should be considered in the analyses. Examples of this type of debris are disbonded coatings in the form of chips and particulates and chemical precipitants caused by chemical reactions in the pool.
 - (iv) The basis for concluding that the water inventory required to ensure adequate ECCS or CSS recirculation would not be held up or diverted by debris blockage at choke-points in containment recirculation sump return flowpaths.
 - (v) The basis for concluding that inadequate core or containment cooling would not result due to debris blockage at flow restrictions in the ECCS and CSS flowpaths downstream of the sump screen, (e.g., a HPSI throttle valve, pump bearings and seals, fuel assembly inlet debris screen, or containment spray nozzles). The discussion should consider the adequacy of the sump screen's mesh spacing and state the basis for concluding that adverse gaps or breaches are not present on the screen surface.
 - (vi) Verification that close-tolerance subcomponents in pumps, valves and other ECCS and CSS components are not susceptible to plugging or excessive wear due to extended post-accident operation with debris-laden fluids.
 - (vii) Verification that the strength of the trash racks is adequate to protect the debris screens from missiles and other large debris. The submittal should also provide verification that the trash racks and sump screens

are capable of withstanding the loads imposed by expanding jets, missiles, the accumulation of debris, and pressure differentials caused by post-LOCA blockage under predicted flow conditions.

- (viii) If an active approach (e.g., backflushing, powered screens) is selected in lieu of or in addition to a passive approach to mitigate the effects of the debris blockage, describe the approach and associated analyses.
- (e) A general description of and planned schedule for any changes to the plant licensing bases resulting from any analysis or plant modifications made to ensure compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this generic letter. Any licensing actions or exemption requests needed to support changes to the plant licensing basis should be included.
- (f) A description of the existing or planned programmatic controls that will ensure that potential sources of debris introduced into containment (e.g., insulations, signs, coatings, and foreign materials) will be assessed for potential adverse effects on the ECCS and CSS recirculation functions. Addressees may reference their responses to GL 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System after a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment," to the extent that their responses address these specific foreign material control issues.

Required Response

In accordance with 10 CFR 50.54(f), the PWR addressees are required to submit written responses to this generic letter. This information is sought to verify licensees' compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this generic letter once their licensing basis has been updated to reflect the results of the mechanistic analysis requested in this generic letter. This request is based on the identified potential susceptibility of PWR recirculation sump screens to debris blockage during design basis accidents requiring recirculation operation of ECCS and CSS and the potential for additional adverse effects due to debris blockage of flowpaths necessary for ECCS and CSS recirculation and containment drainage. The addressees have two options:

- (1) Addressees may choose to submit written responses providing the information requested above within the requested time period.
- (2) Addressees who choose not to provide information requested or cannot meet the requested completion dates are required to submit written responses within 30 days of the date of this generic letter. The responses must address any alternative course of action proposed, including the basis for the acceptability of the proposed alternative course of action.

The required written responses should be addressed to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, 11555 Rockville Pike, Rockville, Maryland 20852,

under oath or affirmation under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f). In addition, a copy of a response should be submitted to the appropriate regional administrator.

The NRC staff will review the responses to this generic letter and will notify affected addressees if concerns are identified regarding compliance with NRC regulations. The staff may also conduct inspections to determine addressees' effectiveness in addressing the generic letter.

Reasons for Information Request

As discussed above, research and analysis suggest that (1) the potential for the failure of the ECCS and CSS recirculation functions as a result of debris blockage is not adequately addressed in most PWR licensees' current safety analyses, and (2) the ECCS and CSS recirculation functions at a significant number of operating PWRs could potentially become degraded as a result of the effects of debris blockage or extended operation with debris-laden fluids as identified in this generic letter. An ECCS that is incapable of providing long-term reactor core cooling through recirculation operation would be in violation of 10 CFR 50.46. A CSS that is incapable of functioning in recirculation mode may not comply with GDCs 38 and 41 or other plant-specific licensing requirements or safety analyses. Bulletin 2003-01 requested information to verify addressees' compliance with NRC regulations and to ensure that any interim risks associated with post-accident debris blockage are minimized while evaluations to determine compliance proceed. This generic letter is the follow-on generic communication to Bulletin 2003-01 and requests information on the results of the evaluations referenced in the bulletin. This information is sought to verify licensees' compliance with the regulatory requirements listed in the Applicable Regulatory Requirements section of this generic letter once their licensing basis has been updated to reflect the results of the mechanistic analysis requested in this generic letter. This request is based on the identified potential susceptibility of PWR recirculation sump screens to debris blockage during design basis accidents requiring recirculation operation of the ECCS and CSS and the potential for additional adverse effects due to debris blockage of flowpaths necessary for ECCS and CSS recirculation and containment drainage.

The NRC staff will also use the requested information to (1) determine whether a sample auditing approach is acceptable for verifying that addressees have resolved the concerns identified in this generic letter, (2) assist in determining which addressees will be subject to the proposed sample audits, (3) provide confidence that any nonaudited addressees have addressed the concerns identified in this generic letter, and (4) assess the need for and guide the development of any additional regulatory actions that may be necessary to address the adequacy of the ECCS and CSS recirculation functions.

Related Generic Communications

- Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Recirculation During Design-Basis Accidents at Pressurized-Water Reactors," June 9, 2003.
- Bulletin 96-03, "Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling-Water Reactors," May 6, 1996.

- Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in the Suppression Pool Cooling Mode," October 17, 1995.
- Bulletin 93-02, "Debris Plugging of Emergency Core Cooling Suction Strainers," May 11, 1993.
- Bulletin 93-02, Supplement 1, "Debris Plugging of Emergency Core Cooling Suction Strainers," February 18, 1994.
- Generic Letter 98-04, "Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment," July 14, 1998.
- Generic Letter 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps," October 7, 1997.
- Generic Letter 85-22, "Potential For Loss of Post-LOCA Recirculation Capability Due to Insulation Debris Blockage," December 3, 1985.
- Generic Letter 91-18, Rev. 1, "Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions," October 8, 1997.
- Information Notice 97-13, "Deficient Conditions Associated With Protective Coatings at Nuclear Power Plants," March 24, 1997.
- Information Notice 96-59, "Potential Degradation of Post Loss-of-Coolant Recirculation Capability as a Result of Debris," October 30, 1996.
- Information Notice 96-55, "Inadequate Net Positive Suction Head of Emergency Core Cooling and Containment Heat Removal Pumps Under Design Basis Accident Conditions," October 22, 1996.
- Information Notice 96-27, "Potential Clogging of High Pressure Safety Injection Throttle Valves During Recirculation," May 1, 1996.
- Information Notice 96-10, "Potential Blockage by Debris of Safety System Piping Which Is Not Used During Normal Operation or Tested During Surveillances," February 13, 1996.
- Information Notice 95-47, "Unexpected Opening of a Safety/Relief Valve and Complications Involving Suppression Pool Cooling Strainer Blockage," October 4, 1995.
- Information Notice 95-47, Revision 1, "Unexpected Opening of a Safety/Relief Valve and Complications Involving Suppression Pool Cooling Strainer Blockage," November 30, 1995.

- Information Notice 95-06, "Potential Blockage of Safety-Related Strainers by Material Brought Inside Containment," January 25, 1995.
- Information Notice 94-57, "Debris in Containment and the Residual Heat Removal System," August 12, 1994.
- Information Notice 93-34, "Potential for Loss of Emergency Cooling Function Due to a Combination of Operational and Post-LOCA Debris in Containment," April 26, 1993.
- Information Notice 93-34, Supplement 1, "Potential for Loss of Emergency Cooling Function Due to a Combination of Operational and Post-LOCA Debris in Containment," May 6, 1993.
- Information Notice 92-85, "Potential Failures of Emergency Core Cooling Systems Caused by Foreign Material Blockage," December 23, 1992.
- Information Notice 92-71, "Partial Plugging of Suppression Pool Strainers at a Foreign BWR," September 30, 1992.
- Information Notice 89-79, "Degraded Coatings and Corrosion of Steel Containment Vessels," December 1, 1989.
- Information Notice 89-79, Supplement 1, "Degraded Coatings and Corrosion of Steel Containment Vessels," June 29, 1990.
- Information Notice 89-77, "Debris in Containment Emergency Sumps and Incorrect Screen Configurations," November 21, 1989.
- Information Notice 88-28, "Potential for Loss of Post-LOCA Recirculation Capability Due to Insulation Debris Blockage," May 19, 1988.

Backfit Discussion

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, 10 CFR 50.109(a)(4)(i) and 10 CFR 50.54(f), this generic letter requests that addressees evaluate their facilities to confirm compliance with the existing applicable regulatory requirements as outlined in this generic letter. This generic letter also transmits an information request for the purpose of verifying compliance with existing applicable regulatory requirements. The staff has determined that, in light of the information identified during the efforts to resolve GSI-191, the previous guidance used to develop most addressees' current licensing basis analyses does not adequately and completely model sump screen debris blockage and related effects. Due to the deficiencies in the previous guidance, a potential analytical error could have been introduced which results in ECCS and CSS performance that does not conform with existing applicable regulatory requirements. In response, the staff revised its guidance for determining the susceptibility of PWR recirculation sump screens to the adverse effects of debris blockage during design basis accidents requiring recirculation operation of the ECCS or CSS to ensure compliance with existing applicable regulatory

requirements. Thus, the information requested by this generic letter is considered a compliance exception to the rule in accordance with 10 CFR 50.109(a)(4)(i).

Small Business Regulatory Enforcement Fairness Act

The NRC has determined that this generic letter is subject to the Small Business Regulatory Enforcement Fairness Act of 1996. Office of Management and Budget (OMB) has declared the letter not to be a major rule. Notification of the letter has been sent to Congress.

Federal Register Notification

A notice of opportunity for public comment on this generic letter was published in the Federal Register (69 FR16980) on March 31, 2004. Comments were received from ten industry groups, one non-profit organization, one private citizen, and the State of New Jersey. The staff considered all comments that were received. The staff's evaluation of the comments is publicly available through the NRC's Agencywide Documents Access and Management System (ADAMS) under Accession No. ML042260161.

Paperwork Reduction Act Statement

This generic letter contains information collections that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These information collections were approved by the Office of Management and Budget (OMB) under approval number 3150-0011, which expires on February 28, 2007.

The burden to the public for these mandatory information collections is estimated to average 7000 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the necessary data, and completing and reviewing the information collections. The staff received two public comments on the estimated burden to the public. In both comments, the burden was estimated to be between 5,000 and 10,000 hours. The staff solicited input from three addressees to better estimate the burden to the public. Based on the public comments and the solicited input, the staff estimates the burden as shown above. Send comments regarding this burden estimate or any other aspect of these information collections, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T-5F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to INFOCOLLECTS@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0011), Office of Management and Budget, Washington, DC 20503.

Public Protection Notification

The NRC may neither conduct nor sponsor, and an individual is not required to respond to, an information collection unless the requesting document displays a currently valid OMB control number.

If you have any questions about this matter, please contact the technical contacts or lead project manager listed below.

Bruce A. Boger, Director
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NRC Staff Resolution of Public Comments Received on the Draft Generic Letter on the Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors

Table 1 Key for Resolution of Comments

Source(s) of Comments, (ADAMS Accession #)	Comment Designator¹	Remarks
Union of Concerned Scientists (ML041490087)	U	
Nuclear Energy Institute (NEI) (ML041550866)	N	
Progress Energy, Inc ML041620346	P	
Tennessee Valley Authority (ML041540383)	T	
Westinghouse Owners Group (WOG) (ML041540377)	W	
Nuclear Utility Backfitting and Reform Group (ML041620354)	B	
Westinghouse (ML041600093)		Comments same as Westinghouse Owners Group comments.
Florida Power & Light (ML041600090)	F	
Duke Power (ML041600569)	D	
Mr. Lanson Rogers (ML041620366)	R	Mr. Rogers' provided information concerning containment coatings.
Dominion Resources (ML04166025)		Comments duplicates those in the NEI and WOG comments.
Strategic Teaming and Resource Sharing (STARS) (ML041690323)	S	STARS endorses the NEI comments and supports the NUBARG Comments.
State of New Jersey (ML041810102)		The State of New Jersey supports the issuance of this generic letter as written.

Bin #	Description
1	Comments related to schedule
2	Comments related to backfit determinations and justifications
3	Comments related to the use of or reference to Generic Letter 91-18
4	Comments related to the burden estimation
5	Comments related to connecting the generic letter to compliance with regulations
6	Miscellaneous comments

Table 2 Resolution Matrix

Bin	Comment #	Comment	Resolution F - Fully Incorporated, P- Partially Incorporated, N - Not Incorporated
1	B-1	<p>In this instance, NUBARG is concerned that ... the request is premature in that the Staff has suggested use of a proposed methodology, which does not yet exist. With these considerations, NUBARG recommends that the Staff not issue the generic letter or, at a minimum, provide the appropriate 10 C.F.R. 50.109 justification and await completion of the Staff's review and approval of the referenced industry methodology before issuing its request of the industry.</p>	<p>N - The NRC approved methodology will be issued shortly after the generic letter is issued and will not impact addressees' ability to respond to the generic letter.</p>
1	N-4	<p>The schedule for actions and information that are requested or required by the draft GL do not appear to take into account the effect of related activities that will impact the conduct and outcome of industry actions in response to the GL and do not appropriately account for the time and effort necessary to perform requested mechanistic evaluations and implement any actions and modifications that may be deemed necessary following completion of these evaluations.</p> <p>Within 15 days of the issuance date of the GL, addressees are required to determine their ability to provide the full scope of information identified in the GL by the requested dates. A key source of information necessary to support this required assessment is an approved evaluation methodology, by which licensees will perform a mechanistic evaluation of ECCS and CSS recirculation functions. As noted in the draft GL, NRC is currently reviewing generic industry guidance and will issue a safety evaluation endorsing portions or all of the generic industry guidance.</p> <p>The NRC's current schedule for actions related to GSI-191 calls for issuance of the GL in August 2004. This schedule also calls for completion of the technical review of industry guidance in September 2004. Per this schedule, licensees will be required to assess their capability to respond to the GL by early to mid September, without having an approved methodology available for use in performing this assessment.</p> <p>Within 60 days of the issuance date of the GL, addressees are requested to provide information regarding their planned actions and schedule to confirm</p>	<p>P - In light of the information provided in this and other similar comments, the staff has changed the timeline as follows:</p> <ol style="list-style-type: none"> 1) The information requested in paragraph 1 of the Requested Information section of the generic letter will now be due to the NRC 90 days after the issuance of the NRC approved methodology. 2) The information requested in paragraph 2 of the Requested Information section of the generic letter will now be due September 1, 2005, instead of April 1, 2005. Also, implementation of the identified actions should be initiated no later than the first refueling outage starting after April 1, 2006; all actions should be completed by December 31, 2007. This should allow ample time for addressees to complete the actions necessary to respond to the generic letter. The new schedule will also allow for any research to either be completed or have enough progress to allow the effects being

Bin	Comment #	Comment	Resolution F - Fully Incorporated, P- Partially Incorporated, N - Not Incorporated
		<p>their compliance with applicable regulations. The requested information includes:</p> <ul style="list-style-type: none"> • A description of the methodology used or that will be used • Completion date of any analysis that will be performed • Plans, schedule and methodology for performance of containment walkdown surveillance <p>As noted above, the current schedule calls for completion of NRC review and endorsement of an evaluation methodology approximately 1 month following the planned issuance of the GL. Assuming these two activities occur per the schedule and there is no delay in issuing the evaluation methodology endorsement, licensees would have approximately 30 days to review the methodology, decide if the methodology is appropriate for their plant(s) and identify necessary resources and schedule to support the evaluation. Because the schedule for responding to the GL and NRC approval of evaluation methodologies are not tied together, the time available for review of approved methodologies could easily be less than the estimated 30 days.</p> <p>The mechanistic evaluation of ECCS and CSS recirculation performance called for by the draft GL requires a comprehensive and detailed evaluation of system performance and operation. This will likely require addressees to contract portions of the evaluation to qualified contractors. We do not believe the resources of qualified contractors are sufficient to support initial evaluations of up to 69 PWRs within the limited time period provided by the draft GL.</p> <p>By April 1, 2005, addressees are requested to provide the results of a comprehensive mechanistic evaluation of ECCS and CSS recirculation functions, including a description and implementation schedule for any planned plant modifications and programmatic controls. The calendar date by which this information is to be provided is not tied to the GL issuance date. As such, any delays in issuance of the GL will directly impact the time available to complete necessary analyses and respond to the GL.</p>	<p>researched to be adequately accounted for in any analysis.</p> <p>In addition, the 15 days to submit an alternate course of action under Required Response has been increased to 30 days.</p>

Bin	Com ment #	Comment	Resolution F - Fully Incorporated, P- Partially Incorporated, N - Not Incorporated
		<p>The above discussion identifies a number of concerns related to the time frames for completion of necessary actions and submittal of required and requested information. These time frames should be revised so that they are consistent with the intent of the GL, as identified in the <i>Discussion</i> section 6. In order for licensees to adequately complete their walkdowns, determine the status of their sumps and containments, perform the required analysis and calculations and develop, procure and complete any necessary modifications; the response dates of the draft GL should be extended and should begin following the availability of accepted evaluation guidance.</p> <p>The <i>Requested Information</i> response of the draft GL should be one year after the date of issuance of approved evaluation guidance instead of April 1, 2005. This schedule would take into account the time constraints identified above and would allow time for resolution of the concerns regarding chemical effects (see Comment N-6) and would accommodate the development and implementation of a risk-informed resolution option (see Comment N-5).</p> <p>The following time line is proposed:</p> <ul style="list-style-type: none"> A. NRC endorsement of evaluation guidance - ~September 2004 B. Generic Letter Issued - ~September 2004 C. Licensee response containing plans and B+180 days ~March 2005 <p>Schedule</p> <ul style="list-style-type: none"> D. Licensee response containing results of B+1 yr ~September 2005 evaluation E. All required modifications complete ~December 31, 2007 	
1	P-4	<p>The 15 days to submit an alternate course of action under <i>Required Response</i> ” (2) seems to be an inadequate period of time. Thirty days would seem more appropriate.</p>	See the response to comment N-4.

Bin	Com ment #	Comment	Resolution F - Fully Incorporated, P- Partially Incorporated, N - Not Incorporated
1	W-9	<p><u>Requested Information</u></p> <p>Item 2, in the draft GL requests licensees to provide information confirming their compliance with regulatory requirement, including any plant modifications that may be necessary to bring the plant(s) into compliance by April 1, 2005. Licensees will likely not have the qualified resources available to perform all of the activities required to complete the mechanistic evaluations, and to design any necessary plant modifications. Some or all of these activities will likely be performed by qualified contractors. Given the amount of qualified resources available to the industry, it is highly unlikely that the entire fleet of 69 PWRs will be able to complete the evaluations needed by April 1, 2005.</p> <p>The April 1, 2005 date in the GL should be revised to one year from the date of the GL.</p>	See the response to comment N-4.
1	N-1	<p>The generic letter should be modified to support industry action to expeditiously resolve GSI-191 concerns. Specifically, the GL should request PWR licensees to take appropriate action, utilizing the latest approved methods, to provide a high degree of assurance that PWR recirculation systems address the effects of debris generation.</p> <p>If the resulting evaluation confirms a "potential susceptibility" (not the same as non-compliance) of PWR recirculation sump screens to post-LOCA debris blockage, licensees should be permitted to take action to eliminate susceptibility by incorporating the revised evaluation into the plant licensing basis. A licensee should also be permitted to develop and implement any resulting corrective actions in a time frame that allows for the design of plant modifications, the procurement of materials, the preparation of procedures, training, implementation, testing, and (if necessary) operating license amendments.</p>	See the response to comment N-4.
1	T-4	It is our understanding that the NRC intends to issue this GL in final form in	See the response to comment N-4.

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		<p>August 2004. For plants that have outages in the spring of 2005, but starting after April 1, 2005, there is a very short time window to complete the analysis, design the modifications, receive NRC approval for the modifications and changes to the analysis techniques, and install the modification. Typically, modifications planned for an outage are design complete six months prior to the outage. TVA does not believe that it is realistic that this can be accomplished in the nine to ten months between August 1, 2004, and May 30, 2005. It is likely to require at least six months getting NRC approval of the analysis and design change, even considering an expedited review. Utilities will be hesitant to start manufacture of new sump screens until such a time as they have at least a reasonable confidence that the available screen area and screen design will be acceptable to the NRC. Instead, NRC should consider requesting plant schedules that complete closure of this generic issue by 2007.</p>	
1	T-2	<p>In section 2(b) of requested information, the GL asks for a justification for any corrective actions that will not be completed by the end of the first refueling outage after April 1, 2005. Is the intent of this for a plant entering a refueling outage on March 1, 2005, and scheduled to start up in early April 2005 to have corrective actions complete prior to start up, or would the corrective actions be tied to the first refueling outage started after April 1, 2005?</p>	See the response to comment N-4.
1	D-5	<p>On page 18, item 2.(b), delete "... of the first refueling outage" and replace with "... of the second refueling outage. This will provide resolution to GSI 191 consistent with the Commission's timetable while permitting adequate time for development of any safe and effective plant modifications, for processing of potential Licensing Amendment Requests, and for refueling outage scheduling issues.</p>	See the response to comment N-4.
1	W-8	<p><u>Requested Information</u></p> <p>Item 1 in the draft GL requests addressees to provide the requested information within 60 days of the date of the GL. The current schedule for issuing the GL is August, 2004. Licensees will have 15 days from the date of issuance to</p>	See the response to comment N-4.

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		<p>determine whether they will be able to provide the information requested in the GL, and if so, 60 days from the date of issuance to provide the requested information to the NRC.</p> <p>Given the scheduled August, 2004 date of issuance of the GL, and the issuance of the Safety Evaluation for the industry guidance (methodology) in September, 2004, licensees will have to base the evaluation of their ability to provide the requested information based on an as-yet unapproved methodology for the mechanistic evaluation of ECCS and CSS recirculation functions.</p> <p>In addition, licensees will have a very limited time (possibly 30 days or less) to evaluate the NRC approved methodology (assuming that the approval occurs at the time of completion of the technical review), determine the applicability to the methodology to their plant(s), identify internal or external resources needed to support the evaluation, and provide a schedule for the completion of the evaluation.</p> <p>If the GL and NRC Safety Evaluation approving the evaluation methodology are not issued on the same date, the GL should be revised to state, "Within 60 days following the issuance of the Safety Evaluation for the methodology, addressees should..."</p>	
1	N-5	<p>In a March 4, 2004 letter to NEI, NRC opened the possibility for risk-informing portions of the evaluation process for addressing GSI-191 concerns.</p> <p>"...the NRC staff plans to discuss, in public meetings, the use of current or planned work to risk-inform Title 10, <i>Code of Federal Regulations</i> Section 50.46, "Acceptance criteria for emergency core cooling system for light-water nuclear power reactors," as a suitable technical basis for defining a spectrum of break sizes for debris generation and containment sump strainer performance."</p>	<p>N - The NRC approved methodology will be issued shortly after the generic letter is issued and will not impact addressees' ability to respond to the generic letter. Options for risk-informing parts of the evaluation will be discussed in the methodology.</p>

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		<p>The development of a risk-informed GSI-191 resolution option is important to industry in that it would enable risk information to be utilized in a technical area that is traditionally treated in a manner that unrealistically compounds known conservatisms. We believe that the GL issuance schedule should be modified to reasonably accommodate the time necessary to complete discussions between NRC and industry on a risk-informed GSI-191 resolution option. In addition, the GL schedule for industry responses to the GL should address the time needed to implement a risk-informed GSI-191 resolution option</p>	
1	W-10	<p><u>Requested Information</u></p> <p>Item 2. (d) (iii) in the draft GL includes the consideration of the head loss effects from the chemical environment in containment. The joint NRC/ industry effort to determine these effects will not be completed until at least the end of 2004. The expectation of licensees to accommodate these unknown effects seems unreasonable.</p> <p>The schedule for the consideration of the impact chemical environment should be revised to reflect the completion and NRC approval of this effort.</p> <p>The time frame required for providing the information requested by the proposed GL does not take into account the related activities being performed by the industry to resolve GSI-191, or the review period that would follow the submittal of industry findings. Licensees would be put in the position of submitting license amendment requests based on methods that have not yet been approved at the time of submittal.</p>	See the response to comment N-4.
1	N-6	<p>As part of the mechanistic evaluation, the results of which are requested by April 1, 2005, addressees are asked to address any debris which might result from the containment environment (thermal and chemical). The GL identifies</p>	N - The NRC approved methodology will be issued shortly after the generic letter is issued and will not impact addressees'

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		<p>chemical precipitants caused by chemical reactions in the pool as an example of the type of chemical reaction to be considered. While the potential for chemical precipitants is worthy of further study to identify if it is a valid concern for PWR containment environments, there have been no studies, evaluations or experiments that demonstrate that chemical precipitants can form under the conditions that will be present in a PWR containment. The necessary experiments to determine whether chemical precipitants can form under prototypic PWR containment conditions are planned to be performed under the joint sponsorship of EPRI, WOG and NRC Research. Results from these tests are not expected until late 2004.</p> <p>Under the current schedule for responses to the GL, results from planned testing will not be available before licensees have to begin the mechanistic evaluations called for by the GL. Licensees will thus be placed in a position where they are called upon to address a potential concern with no technical foundation upon which to base their evaluation.</p> <p>Other than providing some reasonable design margin for the uncertainty associated with these effects, it is not clear how licensees are to address chemical effects under the proposed response schedule. As noted in Comment 4, the response timeline should provide sufficient time for completion of necessary confirmatory research or the GL should cite, with supporting justification, the appropriate standards or requirements to be applied.</p>	<p>ability to respond to the generic letter. Methods for addressing chemical effects will be discussed in the staff's safety evaluation.</p>
1	T-7	<p>If NRC is considering a risk-informed solution to this original design concern, it is important that the timing of such solution is properly integrated into the proposed solutions options. Licensees should be able to allocate resources to implement a risk-informed solution before it invests in a deterministic only solution, otherwise, it will not be cost effective to implement a risk-informed solution. That is, a risk-informed solution is only viable if it can be chosen during the early planning stages. Both options should be on the same schedule.</p>	<p>See the response to comment N-4.</p>

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1	B-6	<p>4. Vagueness of Information Request</p> <p>The industry proposed a methodology for evaluating PWR sumps and provided it to the Staff for review. Although the Staff has indicated that it is reviewing generic industry guidance, and will issue a safety evaluation on the portions that may be used to assist in determining the status of regulatory compliance, it gives no estimate of the schedule for completing this review. The generic letter would, however, request licensees to provide an initial response the generic letter in a time frame that could be prior to the Staff's approval of the industry guidance. It is also not clear at this time whether many of the affected licensees may need to seek Staff review and approval of the plant-specific implementation of the industry methodology in order to change their plant's licensing basis. The Staff's review and approval schedule could also impact a reply by April 1, 2005, wherein a licensee is to demonstrate compliance and address "the configuration of the plant that will exist once all modification required for regulatory compliance have been made." Licensees that are planning outages scheduled to begin shortly after April 1, 2005, would likely be unable to complete corrective actions, as requested by the proposed generic letter, and, yet, would required to provide justification for the delays</p>	See the response to comment N-4.
2	B-2	<p>In this instance, NUBARG is concerned that (1) the Staff does not appear to be following appropriate administrative processes in this proposed action (in that the Staff has not justified the information request in accordance with 10 C.F.R. 50.54(f) and 10 C.F.R. 50.109)With these considerations, NUBARG recommends that the Staff not issue the generic letter or, at a minimum, provide the appropriate 10 C.F.R. 50.109 justification and await completion of the Staff's review and approval of the referenced industry methodology before issuing its request of the industry.</p>	N - The draft generic letter issued for public comment was not a backfit and the backfit discussion was appropriate for that determination. The requests in the final generic letter are considered compliance exceptions to 10 CFR 50.109. The final generic letter fully discusses the rationale for the determination of a compliance exception to the Backfit Rule.

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2	W-11	<p><u>Backfit Discussion</u></p> <p>Contrary to the backfit discussion that states; "No backfit is intended or approved by the issuance of this generic letter, and the staff has not performed a backfit analysis.," the resolution of the issue is likely to constitute a major backfit. Specifically, Item 2. c. in the Requested Information section of the draft GL states: "The submittal may reference a guidance document (e.g., Regulatory Guide 1.82, industry guidance) or other methodology previously submitted to the NRC." Regulatory Guide 1.82, Revision 3 was issued in November 2003, which is well after any operating PWR's operating license was granted.</p> <p>Additionally, the draft GL does not contain a documented evaluation for not performing a backfit analysis as required by 10 CFR 50.109(a)(4).</p>	<p>By definition, a generic communication cannot impose a backfit as it cannot require an addressee to take an action. However, the NRC determined that addressees may view requests in generic communications as requirements. Therefore, where appropriate, the staff treats requests in generic communications as if they were backfits under 10 CFR 50.109. Based on public comments and the resulting evaluation, the generic letter has been changed to a compliance exception to the backfit rule.</p> <p>Since, the draft generic letter issued for public comment was not a backfit, the backfit discussion was appropriate for that determination. The requests in the final generic letter are considered compliance exceptions to 10 CFR 50.109. The final generic letter fully discusses the rationale for the determination of a compliance exception to the Backfit Rule.</p> <p>As discussed in NRR Office Instruction LIC-503, Generic Communications Affecting Nuclear Reactor Licensees, the backfit rule does not require the performance of a backfit analysis when the compliance exception to the backfit rule is invoked. NRR has determined that the staff should prepare simplified value-impact</p>

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			assessments of compliance exceptions to the backfit rule. In accordance with LIC-503, the staff prepared a simplified value-impact assessment.
2	B-3	<p>1. Compliance Backfit</p> <p>The Staff suggests that the information that it would request in the generic letter is necessary to ensure that licensees comply with their current licensing basis and existing NRC regulations. However, the information request clearly establishes that the Staff expects many licensees will find it necessary to perform complex calculations, change their plant's licensing basis, and modify the plant. For example, the Staff states that licensees should use the enhanced debris blockage evaluation guidance in Regulatory Guide ("RG") 1.82 (Rev. 3, Nov. 2003), "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," even though most if not all, of the affected licensees have not committed to comply with this revision of RG 1.82.</p> <p>As another example, in the proposed generic letter, the Staff explains the background of Generic Safety Issue ("GSI") 191, "Assessment of Debris Accumulation on PV@WR Sump Performance," and suggests that it may be necessary for licensees to "undertake complex evaluations to determine whether regulatory compliance exists" in light of new information that indicates previous Staff positions regarding sump blockage may not be conservative. The Staff also admits that methodologies to perform such complex evaluations may not be currently available. If these actions are necessary to ensure compliance with NRC regulations, then, in accordance with 10 C.F.R. 50.109, the Staff should clarify its position in the generic letter.</p>	See the response to Comment W-11.
2	T-5	Contrary to the backfit discussion which state that no backfit is intended or approved, the draft GL constitutes a major backfit. Specifically, the letter states	See the response to Comment W-11.

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		<p>that applicants may use the guidance in Regulatory Guide 1.82, Revision 3, to determine compliance or not yet issued industry guidance. Revision 3 was issued in 2003. Since all operating PWR plants received operating licenses years before the issuance of this regulatory guide, the use of the requirements in that regulatory guide constitute a backfit. A similar argument applies to the forthcoming industry guidance. There have been discussions in public meetings and in correspondence between the NRC and NEI of positions relative to dynamic effects, application of pipe break rules, and other regulatory positions that are different from those currently approved in plant licensing and design bases. Each of these constitutes a backfit.</p>	
2	N-2	<p>As discussed in a separate letter from the Nuclear Utility Backfitting and Reform Group (NUBARG), the NRC purpose for this generic letter is not clear in that, on one hand, it is requested that a licensee confirm compliance with its licensing basis.</p> <p>However, on the other hand, the NRC appears to request that licensees perform evaluations based on guidance that arguably may be outside of their licensing basis. Unless the NRC justifies requiring the use of this guidance as a "compliance backfit," such an action should not be required pursuant to 10 C.F.R. § 50.54(f). Furthermore, should the NRC claim that this issuance is a justified backfit pursuant to 10 C.F.R. § 50.109, a regulatory analysis consistent with 10 C.F.R. § 50.109(a)(6) would still be required.</p>	P - See the response to Comment W-11.

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2	B-5	<p>3. Extent of Actions Necessary to Respond to Information Request</p> <p>NUBARG maintains that the provisions of Section 50.109 apply generally to information requests pursuant to 10 C.F.R. 50.54(f), as discussed in the above-quoted references, and apply specifically to the proposed generic letter due to the extent of the efforts that would be involved in responding to the request. As noted above, licensees may find it necessary to perform complex calculations, change their plant's licensing basis, and to modify the plant to address the concerns identified in the proposed generic letter. Pursuant to 10 C.F.R. 50.54(f) and 10 C.F.R. 50.109, the Staff must justify these burdens that are outside the scope of a plant's current licensing basis, even if the Staff makes a determination that these actions are necessary to assure compliance with regulations or adequate protection of public health and safety.</p>	<p>F - The Backfit Discussion, the Required Response, and the Reasons for Information Request sections of the generic letter document the justification for the requests made in the generic letter in accordance with NRR Office Letter LIC-503.</p> <p>As required by NRR Office Instruction LIC-503, the evaluation in the Required Response section of this generic letter provides assurances that the burden to be imposed on the respondents is justified in view of the potential safety significance of the issue to be addressed in the requested information.</p> <p>The "Backfit Discussion" section of the this generic letter clearly delineates the basis for the staff's backfit determination in accordance with NRR Office Instruction LIC-503.</p> <p>The Reasons for Information Request section succinctly states why addressees are being requested to provide information and how the staff will use the information.</p>
2	B-4	<p>2. Compliance Backfit Evaluation Requirement</p> <p>To comply with its regulatory process requirements, the Staff should clarify in the "Backfit Discussion" that the information request falls within the compliance exception of the backfitting rule (or justify that one of the other exceptions</p>	<p>F - The information request in the draft generic issued for comment was not considered a compliance exception to the backfit rule. The generic letter has since be revised and the requests in the revised</p>

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		<p>apply). 10 C.F.R. 50.109(a)(4). Pursuant to this provision, the Staff must demonstrate that its actions are within one of the exceptions. " New or modified interpretations of what constitutes compliance would not fall within the exception and would require a backfit analysis."</p> <p>Even when the Staff makes a determination that an action is necessary to bring a facility into compliance with a license, rule or order, or into conformance with a written commitment, it still must document the evaluation for its determination. 10 C.F.R. 50.109(a)(4). The documented evaluation must include a statement of the objectives of and reasons for the modification and the basis for invoking the exception, 10 C.F.R. 50.109(a)(6).</p> <p>The proposed generic letter does not adequately justify that the information request is necessary for assuring compliance with existing requirements or commitments. The Staff, therefore, should modify the "Backfit Discussion" to include adequate justification for its position that the information is necessary for it to make a determination that the affected licensees comply with the referenced regulatory requirements for assuring post-accident long- term cooling. If the Staff cannot make this finding, then it must justify the backfit otherwise, or perform a backfit analysis to demonstrate that there will be a substantial increase in the overall health and safety of the public in view of the burden imposed through the information request. 10 C.F.R. 50.109(a)(3).</p>	<p>generic letter are considered compliance exceptions to the backfit rule. Accordingly, in the revised generic letter, the staff has provided a documented determination that the generic letter now falls within the compliance exception to the backfit rule.</p> <p>The "Backfit Discussion" section of the this generic letter clearly delineates the basis for the staff's backfit determination in accordance with NRR Office Instruction LIC-503.</p>
3	U-3	<p>The section of the draft generic letter titled Related Generic Communications (beginning on page 16985, col. 3 and continuing through page 16986, col. 2) lists more than two dozen bulletins, generic letters, and information notices relevant to the subject. This listing is incomplete because it does not include NRC Generic Letter 91-18, Rev. 1, dated October 8, 1997, " Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions." This generic communication is pertinent to the PWR containment sump issue. As stated in GL 91-18, Rev. 1, its stated purpose included guidance for resolving degraded and nonconforming</p>	<p>F - This generic letter was revised to include GL 91-18 in the list of related generic communications.</p> <p>If an addressee determines that while responding to the GL that its current sump configuration does not support its current licensing basis, the staff expects the addressee to take the appropriate steps</p>

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		<p>conditions at nuclear power plants:</p> <p><i>This guidance provided a process for licensees to develop a basis to continue operation or to place the plant in a safe condition and to take prompt corrective action.</i></p> <p>GL 91-18, Rev. 1 had NRC Inspection Manual Part 9900, “ Technical Guidance,” attached. Thus, the NRC provided PWR owners with its rulebook on handling degraded and nonconforming conditions. Section 4.4. of Part 9900 states:</p> <p>In the course of its activities, the licensee may discover a previously unanalyzed condition or accident. Upon discovery of an existing but previously unanalyzed condition that significantly compromises plant safety, the licensee shall report that condition in accordance with 10 CFR 50.72 and 50.73, and put the plant in a safe condition.</p> <p>For a previously unanalyzed condition or accident that is considered a significant safety concern, but is not part of the design basis, the licensee may subsequently be required to take additional action after consideration of backfit issues (see Section 50.109(a)(5)). As noted above, the draft generic letter contains the NRC staff’s express determination that fixes to the PWR containment sump problem are not a backfit. Therefore, this significant safety concern is part of the design basis and licensees “ shall report that condition in accordance with 10 CFR 50.72 and 50.73.”</p> <p>Comment (3) overlaps with Comment (2) (U-2) above because it provides necessary guidance on how to handle the non-conforming conditions that will be identified. The draft generic letter must explicitly reference Generic Letter 91-18, Rev. 1, because this document establishes the NRC’s expectations for dealing with degraded and nonconforming conditions such as those that may be discovered in response to the generic letter.</p>	<p>outlined in GL 91-18.</p> <p>The staff considers the GL 91-18 to now be properly referenced in this generic letter.</p>

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3	N-3	<p>In the <i>Background</i> section of the draft GL it states, <i>During the process of resolving the potential concerns identified in this generic letter, the revised analysis of sump performance may affect addressees' understanding of their facilities' ECCS and CSS recirculation capabilities. In accordance with GL 91-18, Revision 1, ...addressees may find it necessary to reevaluate the adequacy of their compensatory measures in light of the new information and take further action as appropriate and necessary.</i></p> <p>Use of GL 91-18, Revision 1 is appropriate should a licensee determine that its plant fails to conform to its licensing basis. However, for an evaluation of sump performance using guidance, assumptions, and analyses that have not been approved by the NRC on a plant specific basis, use of GL 91-18 is not appropriate.</p> <p>As discussed at the May 19 public meeting on the draft GL, the changes in analytical techniques and assumptions, as well as some of the physical modifications that may be introduced as part of the resolution process can lead to a need for NRC approval before such changes can be implemented. When the new analyses are approved and the modifications installed, they become the new licensing basis and then fall under the provisions of Generic Letter 91-18. The Background section should be revised reflect this clarification on the use of GL 91-18.</p>	<p>P - The final generic letter drops the reference to GL 91-18 in the Background section since it might unnecessarily confuse addressees. This section of the GL has been revised to read: <i>“During the process of resolving the potential concerns identified in this generic letter, the revised analysis of sump performance may affect addressees' understanding of their facilities' ECCS and CSS recirculation capabilities,. Therefore, addressees may find it necessary to reevaluate the adequacy of their compensatory measures in light of the new information and take further action as appropriate and necessary. Upon resolution of the potential concerns identified in this generic letter and the completion of any corrective actions resulting from that resolution, addressees may consider continuing, revising, or retiring their compensatory measures as appropriate.”</i></p> <p>The GL requests that addressees evaluate their compliance with the applicable regulations after all actions are complete and the licensing basis has been updated. If an addressee determines with the new methodology that there are concerns with the ECCS and CSS recirculation functions, the GL provides a justification for continued operation while addressees are implementing the corrective actions</p>

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			identified while responding to this generic letter.
3	T-1	<p>TVA considers that the GL should identify that new research information has identified that the current licensing basis for sump blockage should be re-evaluated and substituted with a more rigorous evaluation. The new methodology, currently being proposed by NEI, would become the new licensing basis once completed and modifications implemented, if they are required.</p> <p>Therefore, the need for PWRs to evaluate operability for a degraded or non-conforming condition in accordance with GL 91-18 as provided in this draft GL is inappropriate because there is no deviation at this time from the current licensing basis. If a plant fails to conform to its current licensing basis, then using GL 91-18 would be appropriate. However, it is difficult to envision how a plant would deviate from the current 50 percent sump blockage assumption which is the basis for most sump designs and which is implicit compliance with 10 CFR 50.46 and the associated general design criteria of Appendix A are based on analyses and assumptions that have NRC approval and are part of the plant licensing basis. However, for an evaluation of sump performance using new regulatory requirements, assumptions, and analyses that have not been approved by the NRC on a plant-specific basis is beyond the requirements of GL 91-18. The changes in analytical techniques and assumptions and some of the physical modifications that have been discussed are likely to require NRC approval before such changes can be implemented. As noted earlier, when the new analyses are approved and the modifications installed, they become the new licensing basis and then fall under the provisions of GL 91-18.</p> <p>NRC should note that this GL identifies potential problems with the original licensing basis. That is, original design assumptions may need to be re-evaluated in light of new information. As such, new design assumptions would be backfitted into the licensing basis of operating reactors. While this may be warranted in light of current research and operational data, it is</p>	See the response to comment N-3.

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		important that the transition be properly managed to avoid improper assessment of emergency core cooling system (ECCS) systems operability. New design assumptions, more conservative than those used during the original design, may prompt design modifications to current systems and structures. However, those assumptions should not come into consideration until after the design modifications are implemented.	
3	W-3	<p><u>Background Section</u></p> <p>To resolve potential concerns identified in the proposed GL, the GL suggests that licensees may need to "reevaluate the adequacy of their compensatory measures in light of the new information and take further action as appropriate and necessary" in accordance with GL 91-18, Revision 1. Operability determinations performed in accordance with GL 91-18 are performed based on a plant's current licensing basis. The methods for evaluating the condition under the proposed GL have not been reviewed and approved by the NRC, and as such, are not part of any plant's current licensing basis. Therefore, this is an inappropriate reference to the use of GL 91-18. When the evaluation methods are approved by the NRC, and any plant modifications, if necessary are completed, these changes will then become the new (current) licensing basis, and operability determinations performed in accordance with GL 91-18 will be based on the new licensing basis.</p> <p>The Background section of the GL should be revised to delete the discussion with respect to the application of GL 91-18.</p> <p>Please also see the discussion for Comment I (Comment W-1) above, regarding compliance with 10 CFR 50.46(b)(5).</p>	See the response to comment N-3.
4	T-6	The estimate of 1000 hours per response for the burden to the public is very low. TVA's estimate for in-house work, not including major physical modifications is approximately 5000 man-hours. Considering contractor costs	P - In light of the information provided in this and similar comments, the staff is changing the burden estimate to 7000 hrs. The new

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		as a man-hour equivalent, we estimate that the project will require 10,000 man-hours per site, not including the cost and installation of a new sump screen design.	staff estimate is based on information provided by nine addressees on their estimated burden.
4	N-8	In the <i>Paperwork Reduction Act Statement</i> section of the draft GL a burden estimate of <i>1000 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the necessary data, and completing and reviewing the information collections</i> is provided. This estimate is low and does not adequately capture the effort necessary to respond to the information requested by the draft GL. We estimate between 5000 and 10000 man-hours to accomplish the work necessary to collect and analyze necessary plant information (including containment walkdowns), perform mechanistic analyses, documentation and review. This estimate does not include the cost and time necessary to implement any plant changes resulting from the analysis, such as procedural changes, plant modifications and revision to the plant licensing basis. The burden estimate should be revised to better reflect the estimated impact of the generic letter requests.	See the response to Comment T-6.
5	W-1	<p><u>Purpose Section</u></p> <p>Item (1) in the draft GL requests that addressees submit information "to confirm compliance with 10 CFR 50.46(b)(5), which requires long-term core cooling, and other existing regulatory requirements listed in this generic letter."</p> <p>The purpose of the GL should be revised to clarify that the intent of the GL is to confirm compliance with 10 CFR 50.46(b)(5) and the other existing requirements listed in the GL, based on the new information (test data and analyses) utilized in the parametric study and technical assessment of GSI-191, that was completed on June 9, 2003. Licensees may be required to revise their "current design and licensing basis," to be in compliance with 10 CFR 50.46(b)(5) based on this new information, and performing a mechanistic analysis that addresses</p>	<p>F - The staff assumes that the addressees current design and licensing basis are adequate to show compliance with the regulatory requirements listed in Applicable Regulatory Requirements section of this generic letter.</p> <p>However, based on new information identified during the efforts to resolve GSI-191, the staff has determined that the previous guidance used to develop current licensing-basis analyses does not adequately and completely model sump</p>

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		<p>debris generation and transport. A schedule for revising the design and licensing basis, if required, which may include NRC approval, would be provided in the response to the GL.</p> <p>The GL should be revised to acknowledge that all licensees are in compliance with 10 CFR 50.46(b)(5) and the applicable regulatory requirements that form their current design and licensing basis.</p>	<p>screen debris blockage and related effects. The staff is revising its guidance for determining the susceptibility of PWR recirculation sump screens to the adverse effects of debris blockage during design basis accidents requiring recirculation operation of the ECCS or CSS.</p> <p>An addressee may determine while evaluating the recirculation function of the ECCS and CSS using the new staff guidance that the addressee needs to revise its licensing basis and update its design to ensure compliance with the regulatory requirements .</p>
5	S-1	The STARS plants believe that the generic letter must allow for the incorporation of identified changes to the licensing basis when applying the new guidance while not affecting current operability.	See the response to Comment W-1.
5	P-1	In a manner similar to Bulletin 96-03, the proposed generic letter should clearly acknowledge the continued safe operation of the plants under the current licensing basis until this issue can be resolved.	See the response to Comment W-1.
5	W-7	<p><u>Applicable Regulatory Requirements</u></p> <p>The proposed GL states: "If, in the course of preparing a response to the requested information, an addressee determines that its facility is not in compliance with the Commission's requirements, the addressee is expected to take appropriate action in accordance with the requirements of Appendix B to 10 CFR Part 50 and the plant technical specifications to restore the facility to</p>	P- The generic letter was revised to reflect the staff's expectation that addressees will not evaluate their current sump configuration using the new methodology and the section of the generic letter referenced in the comment was removed.

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		<p>compliance."</p> <p>Please see the discussion for Comment I (Comment W-1) regarding compliance.</p>	<p>While not explicitly addressed in this generic letter, the staff does expect addressees to take the appropriate actions if they determine that while responding to the generic letter their current sump configuration does not support their current licensing basis. The staff expects the addressees to take the appropriate steps outlined in GL 91-18.</p>
5	D-4	<p>On page 16, last Paragraph, it should be clarified that noncompliance with the Commission's requirements does not imply entry into Technical Specification 3.0.3 (ie, this analysis does not constitute a formal operability evaluation). The provision of appropriate Justification for Continued Operation would be the responsibility of the licensee.</p>	<p>See the response to Comment W-1.</p>
5	W-6	<p><u>Discussion Section</u></p> <p>The proposed GL states: "To assist in determining on a plant-specific basis whether compliance exists with 10 CFR 50.46(b)(5), addressees may use the guidance contained in Regulatory Guide 1.82, (RG 1.82), Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident," dated November 2003."</p> <p>Please see the discussion for Comment I regarding compliance.</p>	<p>See the response to Comment W-1.</p>
5	W-4	<p><u>Discussion Section</u></p> <p>The proposed GL states: In light of the credibility of the concerns identified above, the NRC staff has determined that it is appropriate to request that addressees submit information to confirm their plant-specific compliance with NRC regulations and other existing regulatory requirements listed in this generic letter pertaining to post-accident debris blockage."</p>	<p>See the response to Comment W-1.</p>

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		Please see the discussion for Comment I regarding compliance.	
6	N-9	The <i>Requested Information</i> section of the draft GL (section 1b) requests as part of the 60-day response, the results of any completed containment surveillance walkdowns. This request for results should be a) modified to identify the specific results or derived conclusions that are to be addressed in the response and b) moved to be incorporated as part of the detailed information request following completion of the evaluation (section 2 of <i>Requested Information</i>).	F - The requested information on the results of completed containment surveillance walkdowns has been removed from the 90-day response and incorporated in item 2(c) of the Requested Information section.
6	D-1	On page 7, second paragraph, delete "...were unable to confirm regulatory compliance implemented" and replace with "chose to implement". The focus of NRC Bulletin 2003-01 was to suggest various interim actions to reduce risk. Actions taken were selected based on actual impact on plant risk.	F - The generic letter was changed to reflect this comment. The change reflects the fact that Bulletin 2003-01 gave addressees another option if they chose not to confirm regulatory compliance.
5	W-2	<p><u>Background Section</u></p> <p>The draft GL states "Addressees who were unable to assure regulatory compliance pending further analysis were asked to describe any interim compensatory measures that have been or will be implemented to reduce risk until the analysis could be completed."</p> <p>This statement should be revised to reflect that NRC Bulletin 2003-01 provided two options for the Requested Information and the second option was describe what interim compensatory measures that have been or would be implemented. Option 2 was provided in Bulletin 2003-01, because the methodology necessary to perform the mechanistic analysis to address debris generation and transport was not available.</p> <p>Please also see the discussion for Comment I above, regarding compliance with 10 CFR 50.46(b)(5).</p>	See the response to Comment D-1.
6	U-4	The draft generic letter mentions revisiting the adequacy of compensatory	N - In the referenced April 22, 2004, letter

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		<p>measures taken in response to last year' s bulletin and to revise/supplement them as applicable. By letter dated April 22, 2004, Mr. James Dyer of the NRC informed Mr. Jim Riccio of Greenpeace that the NRC believes " failure to meet a commitment in itself does not constitute a violation of a legally binding requirement." If that indeed is the NRC' s position (as unbelievable as it seems), then the compensatory measures that licensees commit to take, either in response to the bulletin or generic letter) are unenforceable by NRC and therefore little or no credit in safety space should be accorded to them. If the NRC is to place any reliance on compensatory measures as risk reduction features, the NRC must issue Confirmatory Orders to ensure the agency can compel licensees to do them.</p>	<p>from Mr. Dyer to Mr. Riccio, it is stated that the NRC in most cases cannot take formal enforcement actions solely on the basis of whether licensees fulfill commitments, since failure to meet a commitment in itself does not constitute a violation of a legally binding requirement such as a rule, order, license condition, or technical specification. It is also stated that if failures to meet commitments result in violations of the Commission's health and safety regulations, the staff will take the appropriate enforcement actions.</p> <p>In this case, the staff continues to work with addressees and does not believe it is necessary to take additional actions to ensure addressees carry out the compensatory measures identified in their responses to Bulletin 2003-01. These compensatory measures are temporary measures to reduce risk only until an evaluation to determine compliance is complete and are not being used to show compliance with any regulation. These compensatory measures will no longer be necessary once an addressee has responded to the generic letter and completed all identified actions. As discussed in the reference April 22, 2004 letter, if these compensatory measures were being used to show compliance with a</p>

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			regulation, the staff could take additional action if they were not being implemented.
6	U-1	<p>According to the notice, “In response to these ECCS suction strainer plugging events, the NRC issued several general communications, including Bulletin 93-02... These bulletins requested that BWR licensees implement appropriate procedural measures, maintenance practices, and plant modifications to minimize the potential for the clogging of ECCS suction strainers by debris accumulation...” (page 16981, col. 3). And, “If, in the course of preparing a response to the requested information, an addressee determines that its facility is not in compliance with the Commission’s requirements, the addressee is expected to take appropriate action in accordance with the requirements of Appendix B to 10CFR Part 50 and the plant technical specifications to restore the facility to compliance” (page 16984, col. 2). And, “Therefore, the information requested in this generic letter is necessary to confirm plant-specific compliance with 10 CFR 50.46 and other existing regulations” (page 16985, col. 3). And, “Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10CFR 50.54(f), this generic letter transmits an information request for the purpose of verifying compliance with existing applicable regulatory requirements (see the Applicable Regulatory Requirements section of this generic letter)” (page 16986, col. 2). And finally, “No backfit is either intended or approved by the issuance of this generic letter” (page 16986, col. 2).</p> <p>In sum, the NRC will not be asking PWR owners to meet some new regulatory requirement. Instead, the NRC will be asking PWR owners to state how they do now or will in the future comply with existing regulatory requirements.</p> <p>During public meetings conducted by the NRC on May 19, 2004, members of the Nuclear Energy Institute (NEI) and representatives of NRC licensees asserted that the language in the draft generic letter placed an undue burden on them. They argued that the draft generic letter would have them conduct two sets of analyses: (1) to determine if the existing containment sump configuration</p>	<p>P-The staff remains committed to making addressees comply with the regulations. The primary reason this generic letter is being issued is to ensure that addressees continue to comply with regulations in light of the information coming from the resolution of GSI-191.</p> <p>Currently, addressees are assumed to be in compliance with their licensing basis and should remain in compliance until the licensing basis has been updated.</p> <p>Based on the new information identified during the efforts to resolve GSI-191, the staff has determined that the previous guidance used to develop current licensing-basis analyses does not adequately and completely model sump screen debris blockage and related effects. The deficiencies in the previous guidance potentially resulted in an analytical error that could result in ECCS performance that does not conform with the requirements in 10 CFR 50.46(b)(5). As a result, the staff revised the guidance for determining the susceptibility of PWR recirculation sump screens to the adverse effects of debris blockage during design basis accidents</p>

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		<p>complied with regulations, and (2) to determine if the existing containment sump configuration conformed with net positive suction head margins as calculated using some methodology allegedly to be submitted by NEI and approved by NRC later this year. They asserted that they would perform the second analysis, but opposed doing the first analysis because it was, in the words of Mr. Tony Pietrangelo of NEI, “distracting.”</p> <p>The industry representatives also asserted that the second analysis was overly conservative and would lead to a gross over-design of the containment sump.¹ Consequently, it was their stated view that results from the second analysis indicating that plant modifications were necessary did not constitute proof that the existing configuration did not comply with regulations.</p> <p>The approach advocated by industry is flawed because it would omit any determination as to the compliance of the existing configuration to the regulations. According to the industry representatives, the analysis using the to-be-approved methodology has the remarkable quality of demonstrating compliance with the regulations (a) if the initial screening shows no modifications are necessary, (b) if the initial screening plus “refinements” shows no modifications are necessary, or (c) once modifications to the plant are completed. They contend (or pretend) that results from this methodology can only show “goodness,” not “badness.” That’s preposterous and/or absurd.</p> <p>The industry argues that the determination of whether the existing configuration complies with regulations is an undue burden on them. Yet in the same breath, they talk about using methodology that biases them towards installing grossly over-designed containment sumps. This cognitive dissonance strains credibility to the point of disbelief.</p> <p>If the NRC buckles to this industry pressure, there will be adverse consequences. First, absent a plant specific determination of non-compliance, the NRC lacks the means to compel any licensee who balks about upgrading</p>	<p>requiring recirculation operation of the ECCS or CSS. The staff expects that once the evaluation requested in this GL has been performed, addressees will update their licensing basis. The staff has developed a schedule for addressees to evaluate the impact of the revised guidance on sump screen performance and other related effects of extended post-accident operation with debris-laden fluids, make any necessary modifications, and update their licensing basis. In the interim period, while addressees are responding to the generic letter and updating their licensing bases, the staff believes that continued operation of PWRs is justified. The justification for continued operation is documented in this generic letter. The results of the evaluation requested in this generic letter will only be used to determine nonconformance with the regulation once the addressees’ licensing basis has been updated. Therefore, the staff does not expect addressees to evaluate their current configuration using the new methodology.</p> <p>If an addressee determines while responding to the GL that its current sump configuration does not support its current licensing basis, the staff expects the addressee to take the appropriate steps outlined in GL 91-18.</p>

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		<p>the containment sump to do so. If the to-be-submitted-and-approved methodology is considered to be “ overkill,” any analysis using it showing that a plant lacks adequate net positive suction head does not provide the NRC staff with sufficient grounds for compelling that licensee to implement the modifications suggested by the results. After all, the NRC cannot impose such a requirement without a full-fledged cost-benefit backfit analysis.</p> <p>The other major adverse safety implication from failure to make compliance determinations stems from the NRC’s move to risk-informed regulation. Absent a plant-specific determination of noncompliance, there will be no licensee event reports (LERs) about operability impairments. Thus, no LERs will go into the databases on equipment and system reliability/performance. Thus, no LERs will go into the NRC’s Accident Sequence Precursor program. Thus, this longstanding safety problem will not appear on the risk radar and future risk-informed regulatory decisions will be based on incomplete information. The fact is that many reactors operated for many years with inadequate net positive suction head for emergency core cooling systems under certain design basis conditions. Compliance determinations are absolutely necessary so as to provide information to the risk databases on which reactors and for how long. Had the NRC stayed with deterministic regulation, then fixing the containment sump problem without compliance determinations would not little consequence. The shift to risk-informed regulation carries with it the obligation on the part of NRC and industry to collect and apply all plant information – not just that information that yields favorable results.</p> <p>Another adverse consequence from failure to make compliance determinations relates to the to-be submitted- and-approved methodology being advertised as overly conservative and yielding grossly over-designed containment sumps. Left unchallenged by compliance determinations showing the extent of the safety problem, this would permit the industry from pointing to this matter as an example of NRC’ s alleged regulatory excess. The compliance determinations are necessary to shield the NRC from industry’ s future charges of NRC “</p>	<p>For this issue, the information in any LER will be of little value because this generic issue is known, the generic implications have been assessed, and the issue is being resolved. Additionally, since the addressees are complying with their current licensing basis, there is no requirement for the submittal of LERs.</p>

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		<p>ratcheting” up the safety levels.</p> <p>The NRC must either require compliance determinations or abandon its risk-informed regulatory initiatives.</p>	
6	T-3	<p>In section 2 (c) of requested information, the GL states that "the submittal may reference a guidance document (e.g., Regulatory Guide 1.82, industry guidance, or other methodology previously submitted to the NRC.)" The current industry guidance is very conservative so that it is unlikely that many, if any, plants could show acceptable ECCS performance using that guidance alone. The GL needs to have a provision to allow plant-specific analyses based on the technical considerations and assumptions presented in that analysis as a new license amendment. Plants should not be constrained to previously approved methodologies.</p>	<p>N - The generic letter does not restrict addressees to previously approved methodologies. The reference section of the generic letter allows addressees to reference guidance documents previously submitted to the NRC so that addressees will not have to duplicate information that has already been submitted.</p>
6	P-3	<p>The term “containment walkdown surveillance” under “<i>Requested Information</i>” 1 (b) should be clarified as being equivalent to the NEI 02-01 walkdown or an appropriate definition should be provided.</p>	<p>N - The staff is not endorsing specific methodology for the performance of containment walkdowns.</p>
6	P-2	<p>Throughout the proposed generic letter, greater clarity is needed in discussing the current licensing basis, Commission’s requirements, regulatory requirements, and other such terms, especially with regard to compliance.</p>	<p>See the response to Comment U-1</p>
6	R-1	<p>Mr. Rogers supports in-situ testing of containment coatings to determine their condition.</p>	<p>N - The addressees will have to take failed coatings and paint into account when performing their analysis. The NEI baseline methodology under review by the NRC addresses coatings.</p>
6	N-7	<p>In the <i>Background</i> section of the draft GL it states, <i>In response to Bulletin 2003-01, PWR licensees that were unable to confirm regulatory compliance implemented or plan to implement compensatory measures to reduce risk or otherwise enhance the capability of the ECCS and CSS recirculation functions.</i></p>	<p>P- The generic letter was revised to accurately reflect Bulletin 2003-01. Specifically, the generic letter now reflects the following from the bulletin: Option 1 in</p>

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		<p>(Emphasis added)</p> <p>Similarly, in the <i>Reasons for Information Request</i> section of the draft GL it states Bulletin 2003-01 requested information to verify addressees' compliance with NRC regulations and to ensure that any interim risks associated with post-accident debris blockage are minimized while evaluations to determine compliance proceed....(Emphasis added)</p> <p>These statements are incorrect. The Bulletin requested information and provided two options by which to respond. Option 1 requested a statement that mechanistic analyses have been performed that take into account recent research findings described in the Bulletin. Option 2 requested a description of compensatory measures that have been or will be implemented to reduce the risk associated with potentially degraded or nonconforming ECCS or CSS recirculation functions. Because reviewed and accepted guidance necessary to perform the mechanistic analyses cited in Option 1 is not currently available, most PWR licensees chose Option 2 and implemented compensatory measures. Confirmation of compliance with a plant's licensing basis was not requested and would not have served the intent of the Bulletin since the licensing bases for most plants do not include mechanistic analyses that take into account recent research findings. The draft GL statements cited above should be revised to accurately reflect the Bulletin 2003-01 information request.</p>	<p>Bulletin 2003-01 requested that addressees state that the ECCS and CSS recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in the bulletin, taking into account the recent research findings described in the Discussion section of the bulletin, and are in compliance with all existing applicable regulatory requirements. Option 2 asked addressees to describe any interim compensatory measures that have been implemented or that will be implemented to reduce the risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is completed. If none of the interim compensatory measures listed in the Discussion section will be implemented, provide a justification. Additionally, for any planned interim measures that will not be in place prior to your response to this bulletin, submit an implementation schedule and provide the basis for concluding that implementation is not practical until a later date.</p> <p>The staff reviewed the generic letter to ensure it reflected the contents of Bulletin 2003-01</p>

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6	U-2	<p>The draft generic letter discusses containment walkdowns. For example, "... provide a statement of whether or not you plan to perform a containment walkdown surveillance in support of the analysis of the susceptibility of the ECCS and CSS recirculation functions to the adverse affects of debris blockage" (page 16984, col. 3).</p> <p>The draft generic letter' s treatment of potential debris sources is unduly limited. Containment walkdowns serve a useful function in establishing the current condition of potential debris sources. Anything that should not be within containment, like the unqualified coatings applied inside the Davis-Besse containment or the " temporary" materials found lingering within the DC Cook containments, should be identified by the walkdowns and either removed or justified in-place.</p> <p>But the draft generic letter fails to look into the future so as to provide sufficient protection against potential debris sources down the road. To remedy this fundamental flaw, the draft generic letter must be supplemented with explicit requirements for PWR owners to identify the procedural measures (e.g., foreign material exclusion, housekeeping, design reviews for modifications within containment, inspection programs for containment coatings, etc.) that provide reasonable assurance that potential debris sources will continue to be properly controlled.</p>	<p>N - The generic letter already goes beyond containment walkdowns as a means to control potential debris sources. Paragraph 2(f) of the Required Information section of the generic letter requests addressees to provide a description of the existing or planned programmatic controls that will ensure that potential sources of debris introduced into containment (e.g., insulations, signs, coatings, and foreign materials) will be assessed for potential adverse effects on the ECCS and CSS recirculation functions.</p> <p>Additionally, the industry guidance addresses the need for containment cleanliness programs. The NRC staff intends to document its review of the industry guidance in a safety evaluation.</p>
6	D-3	On page 9, seventh line, "section head" should be "suction head."	F - The generic letter was changed to reflect this comment.
6	D-2	On page 8, first paragraph in "Discussion" section, delete third and fourth sentences. Chemical effects are not considered by industry to be relevant for PWRS. This will be confirmed by EPRI/industry test program currently in progress.	N - There is ongoing research on the impact of chemical effects on sump performance. The assumption remains that chemical effects may potentially affect sump performance and needs to be accounted for in modeling analyses.

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6	R-2	If GSI-191 is to be properly addressed, no credit should be taken for any paint that has been in place for 10 years.	N - See response to comment R-1.
6	W-5	<p><u>Discussion Section</u></p> <p>The proposed GL states: "NRC staff recommends the use of an analysis method that mechanistically accounts for debris generation and transport, post accident equipment and systems operation with debris laden fluid."</p> <p>This "recommendation" will be inferred by licensees as a requirement, which will limit the options licensees are likely to explore to resolve the issue. As such, the statement should be deleted from the proposed GL.</p>	N - The statement in the generic letter is a staff recommendation for the analysis method. The staff considers that a mechanistic analysis of debris generation and transport, post-accident equipment and systems operation with debris-laden fluid is the most accurate method to model sump performance. Addressees are free to use a method other than the one recommended by the staff. The staff is open to other methods of resolving this issue.

1.Used to distinguish between comment numbers from various sources. This designator is used in the table above that resolves these comments. For example, the first comment by UCS is designated U-1.