Duke Power

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September 1, 2005

U. S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Duke Energy Corporation
Oconee Nuclear Station, Units 1, 2, & 3
Docket Nos. 50-269, 50-270, 50-287
McGuire Nuclear Station, Units 1 & 2
Docket Nos. 50-369, 50-370
Catawba Nuclear Station, Units 1 & 2
Docket Nos. 50-413, 50-414
Response to NRC Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors

On September 13, 2004, the NRC issued Generic Letter (GL) 2004-02. The NRC issued the Generic Letter to request licensees to perform an evaluation of the emergency core cooling system and containment spray system recirculation functions in light of the information provided in the GL and, if appropriate, take additional actions to ensure system function.

The Generic Letter requests that licensees submit information regarding planned actions and the schedule for completing the requested evaluation within 90 days of the date of the safety evaluation report providing guidance for performing the requested evaluation. The staff safety evaluation was issued by NRC letter to NEI dated December 6, 2004. Duke Energy Corporation (Duke) submitted the 90 day response to the GL on March 1, 2005. The GL also requested that more detailed information regarding the resolution of GSI 191, as described in the GL, be submitted to the NRC by September 1, 2005.

In the March 1, 2005 response, Duke committed to address the adverse effects relevant to GSI-191 as addressed in Generic Letter 2004-02 by September 1, 2005. At this time, Duke has not fully completed this work. The schedule for addressing the adverse effects relevant to GSI-191 is described in Attachments 1, 2, and 3 for Oconee, McGuire and Catawba, respectively.

Pursuant to 10 CFR 50.54(f), Duke's September 1, 2005 response to GL 2004-02 is provided in Attachments 1, 2, and 3.

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This letter contains regulatory commitments. The regulatory commitments are provided in Attachments 4, 5, and 6 for Oconee, McGuire, and Catawba, respectively . If you have questions or need additional information, please contact Mary Hazeltine at 704-382-5880.

Very truly yours,

James R. Morris
Vice President, Nuclear Support

Attachments

I affirm that I, James R. Morris, am the person who subscribed my name to the foregoing, and that all the matters and facts herein are true and correct to the best of my knowledge.

Vice President, Nuclear Support

Subscribed and sworn to me: September 1, 2005
Date

Notary Public

My Commission Expires: August 17, 2006
Date

SEAL

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MNS MasterFile MC-801.01 (MG01DM)
CNS MasterFile CN-801.01 (CN04DM)
ONS MasterFile ON-801.01 (ON03DM)
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2. NRC Request:
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.

Oconee confirms that ECCS and Containment Spray System (CSS) recirculation functions under debris loading conditions will be in compliance with the regulatory requirements listed in the applicable Regulatory Requirements Section of this Generic Letter. The existing sump screens, trash racks and supporting structural members will be replaced with a new passive strainer assembly. The new strainer will be designed by CCI, incorporating CCI's patented "Pocket Cassette" design. The new assembly will provide approximately 5000 square feet of surface area for the strainer, utilizing perforated plate with a hole size of approximately 1/12 inch. Existing trash racks will be removed.

Duke has contracted with Stone & Webster to perform evaluations of the effects of operation with debris-laden fluid on downstream components. There is ongoing work in the area of chemical effects as well. Should these ongoing analyses indicate a need for additional plant modifications; these will be implemented to ensure continued compliance with all applicable regulations. Status and schedule information are presented in Item 2 (b) below.

(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.

The corrective actions required by this Generic Letter will be completed on or before December 31, 2007 as follows:

1. A baseline evaluation has been performed for Oconee by ENERCON Services, Inc. This evaluation was performed using the guidance of NEI 04-07, "Pressurized Water Reactor Sump Performance Evaluation Methodology, Revision 0" (NEI 04-07) as amended by the NRC SER for that methodology. The evaluation is currently under review by Oconee and will be complete by June 30, 2006.

2. A downstream effects evaluation will be completed for Oconee by Stone & Webster. This evaluation will be performed using the methodology provided by WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191," (WCAP-16406-P). Some exceptions to the WCAP-16406-P methodology may

be taken. The evaluation is currently in progress and will be complete by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

3. Chemical effects will be evaluated to confirm that sufficient margin exists in the final sump design to account for this head loss. The evaluation will be complete by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

4. A modified containment sump strainer and supporting structure will be installed in the fall of 2005 for Oconee Unit 2, the spring of 2006 for Oconee Unit 3 and the fall of 2006 for Oconee Unit 1.

5. A walkdown of containment using the guidance of NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments" was completed for Oconee Unit 3 in the fall of 2004 and a confirmatory walkdown of Unit 1 was completed in the spring of 2005. A similar confirmatory walkdown will be performed for Unit 2 in the fall of 2005.

6. The plant labeling process will be enhanced to ensure that any additional labels or signs placed inside containment are evaluated to ensure that potential debris sources are evaluated for impact to RBES/ECCS function. This corrective action will be completed by December 31, 2007.

7. Enhancements will be made to the Oconee coatings program. These enhancements include: increased programmatic control to clearly document and trend evaluations performed on degraded coatings and to ensure that potential coating debris is evaluated for impact on ECCS and Reactor Building Emergency Sump function. This corrective action will be completed by December 31, 2007.

8. Fibrous insulation installed on the cooling water piping associated with each unit's 'B' Auxiliary Reactor Building Cooling Unit will be removed. This insulation removal is complete for Unit 1. The insulation will be removed in the fall of 2005 for Unit 2 and the spring of 2006 for Unit 3.

9. Duke will evaluate the modification process to determine if additional controls are needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns. This evaluation will be completed by June 30, 2006.

(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.)

Oconee has used the methodology contained in NEI 02-01 for assessment of potential debris sources inside containment. A thorough walkdown of Oconee Unit 3 was performed by ENERCON Services, Inc. in the fall of 2004. A confirmatory walkdown of Unit 1 was performed in spring of 2005. A similar confirmatory walkdown of Oconee Unit 2 will be completed in fall of 2005. Results from the Unit 3 assessment show that the potential debris sources include reflective metallic insulation, coating debris, tape, tags, stickers, cable ties, small quantities of fiberglass insulation, caulk, and latent debris in the form of particulate and fiber.

Susceptibility of the ECCS and CSS recirculation functions to the adverse effects of post-accident debris blockage and operation with debris-laden fluids will be evaluated using the methodology contained in NEI 04-07, as amended by the NRC SER for that methodology. The methodology for evaluation of debris blockage susceptibility includes consideration of debris generation, transport, and head loss across the sump strainer. No exceptions to the methodology are taken.

Evaluation of susceptibility to adverse effects of operation with debris-laden fluids will be completed using the methodology provided in WCAP 16406-P with minor exceptions.

Structural analyses and vortex analyses were performed by CCI using commonly accepted engineering practice.

Integrated Chemical Effects Testing (ICET) performed at the University of New Mexico has been on-going to identify the chemical reaction products that are intended to be representative of a PWR sump in a post-LOCA environment. This information as well as any other publicly available chemical effects testing information will be used to evaluate head loss effects of chemical precipitants.

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.

Oconee credits containment overpressure in support of NPSH analyses for the Low Pressure Injection (LPI) and Reactor Building Spray (BS) pumps. Since containment overpressure credit could only be applied to the extent necessary, no NPSH margin for the LPI and BS pumps exists.

Containment overpressure credit in support of LPI and BS pumps was initially approved in 1999. However, Oconee currently has an Operable but Degraded/Nonconforming condition with respect to the containment overpressure credited in support of the Building Spray pumps NPSH. During the course of revisiting the safety analyses in support of NPSH calculations, Oconee discovered a non-conservative single failure assumption in the safety analysis supporting containment overpressure. This analysis has been corrected, but the licensing basis for overpressure credit needs to be revised. We will submit this LAR prior to March 31, 2006.

Critical inputs to the containment response analysis are controlled in a Selected Licensee Commitment (SLC). A revision to this SLC, potential modifications to improve instrumentation accuracy, and reanalysis incorporating the modified Reactor Building Emergency Sump strainer head loss are planned to resolve the Operable but Degraded/Nonconforming condition. As discussed in Item 2(e) below, a License Amendment Request is planned following completion of the reanalysis.

(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.

The submerged area of sump screen at the time of switchover to sump recirculation is approximately 5000 ft^2. The Oconee sump strainer will be 100% submerged at the time of switchover to sump recirculation (defined as the time when BWST isolation valves are closed).

(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.

The maximum head loss postulated from debris accumulation on the submerged sump screen is less than 0.1 feet at a sump temperature of 104°F. Confirmatory testing has been performed to ensure the postulated debris bed head loss and clean strainer head loss combined do not exceed 0.1 feet. The debris bed will consist of fiber and particulate debris. The primary constituent of the fiber debris will be fibers from Owens Corning SSL II piping insulation. The primary constituents of the particulate debris are paint chips, dirt, concrete, and rust particles. Reflective Metallic Insulation (RMI) debris was not included as a debris bed constituent for analytical purposes, as our site-specific test results show that RMI debris reduces the debris bed head loss. A hydraulic analysis has been performed by CCI. This analysis is currently under review by Oconee.

(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 flow paths.

Water inventory for containment sump operation is provided by a combination of the Borated Water Storage Tank (BWST) and Core Flood Tanks while ignoring any contribution from the Reactor Coolant System. Minimum post-accident water level calculations also conservatively account for identified areas of water holdup, such as sumps, fuel transfer canals, vessel cavities, floor areas, vaporization of fluids, and water retained in Reactor Building Spray System piping.

Oconee containments are non-compartmentalized for the most part, and do not lend themselves to water holdup or choke points. This was further verified as part of the containment walkdown performed by ENERCON Services on Unit 3 in the fall of 2004 to satisfy the NEI 02-01 Condition Assessment Guidelines for Debris Sources Inside PWR Containments. A confirmatory walkdown of Unit 1 was completed in the spring of 2005. A similar confirmatory walkdown will be performed for Unit 2 in the fall of 2005.

(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.

An analysis of downstream effects will be completed using the methodology in WCAP-16406-P with minor exceptions. This analysis will take into account the design of the new containment sump strainer perforations. The effects of debris penetrating the strainer on downstream equipment will be evaluated to confirm intended functions during ECCS recirculation.

Inspections of the sump strainer will continue to be performed each refueling outage as required by Technical Specification Surveillance Requirements 3.5.2.6 and 3.5.3.6 to ensure that the sump strainers are being maintained in an acceptable condition and that no adverse gaps or breaches exist.

(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.

As discussed in Item 2(c) above, evaluation of downstream effects of operation with debris-laden fluids is being performed utilizing the methodology provided in WCAP-16406-P with minor exceptions. This analysis will evaluate ECCS and Containment Spray System components to confirm that they are not susceptible to plugging or excessive wear due to extended post-accident operation with debris-laden fluids. Corrective actions will be implemented as appropriate.

(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.

The Oconee replacement strainer design will be installed in essentially the same footprint as the existing reactor building emergency sump. It extends above the floor level and does not include a trash rack. The front face of the strainer will serve essentially the same function as a trash rack, by virtue of its pocket design. Large debris will be kept away from the strainer surfaces by the pocket opening, which is approximately 3 by 5 inches. The strainer vendor (CCI) has performed structural analyses for the new strainer assembly design which includes loading from debris accumulation and resultant head loss. The approach velocity at the strainer face is reduced by a factor of about 3.5; therefore greatly reducing the potential adverse effects of impact from objects entrained in the flow stream.

Analyses of break jets and the potential for missile generation were performed by Stone & Webster using methodologies that have been previously incorporated into the ONS licensing basis. Oconee is currently reviewing these analyses. The analyses demonstrated that a separate trash rack was unnecessary. The jet impingement evaluation of the new strainer design, crediting Leak Before Break, concluded that there are no credible HELB jets that could damage the strainer when needed during a LOCA. The missile evaluation of the new strainer design concluded that there is no credible missile that could damage the strainer when needed during a LOCA.

(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 analysis.

No active strategies for enhanced containment sump performance are planned for Oconee.

(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.

Oconee has prepared a License Amendment Request (LAR) for a change to Technical Specification Surveillance Requirements 3.5.2.6 and 3.5.3.6. The wording in these Surveillance Requirements makes specific reference to "screens and trash racks", which are not present in the new strainer design. References to screens and trash racks will be replaced with the term "strainer". With this more generic component terminology, the SR can be uniformly applied to both future and present sump strainer designs. This LAR was submitted on August 18, 2005.

An additional LAR is needed to revise our current licensing basis with respect to containment overpressure credit. In May 2005, during the course of revisiting our safety analyses in support of NPSH calculations, Oconee discovered a non-conservative single failure assumption in the safety analysis supporting containment overpressure. The analysis has been corrected, but the licensing basis for overpressure credit needs to be revised. We will submit this LAR prior to March 31, 2006.

Additional modifications may be identified by the evaluation of downstream effects. Any additional modifications will be identified by June 30, 2006. There are no licensing actions or exemptions anticipated in association with addressing downstream effects.

(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.

Oconee has several programmatic controls in place to ensure that potential sources of debris introduced into containment will be assessed for adverse effects on the ECCS and Containment Spray System recirculation functions. These programmatic controls consist of requirements related to coatings, containment housekeeping, FME, materiel condition, debris source control, modifications, and station labeling.

Coatings Maintenance Program

This program has been described in detail in prior correspondence to the NRC including Oconee's responses to 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" and Bulletin 03-01 "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors" as well as a response to a RAI associated with Bulletin 03-01 dated April 29, 2005. Recent discussions with the NRC, a review of historical licensing correspondence, and evaluation of current programmatic practices revealed the need for the following programmatic revisions:

1) Increase programmatic control to clearly document the evaluation performed on degraded coatings identified during the periodic inspections. Different evaluation approaches are contained in EPRI document TR-109937 (Guideline on Nuclear Safety-Related Coatings).
2) Institute a programmatic requirement for engineering to verify any potential coating debris will remain within the design assumptions for the ECCS and Reactor Building Emergency Sump operation in the recirculation mode. The

coating inspection findings and resultant actions will be reviewed every refueling outage and any coating degradation trends will be appropriately considered.

Containment Housekeeping/Materiel Condition

Duke's August 7, 2003 response to Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," described practices regarding containment cleanliness.

As a general practice extensive containment cleaning is performed using water spray. The Reactor Building, from the fourth floor to basement, is washed down with high pressure water spray every refueling outage. Comprehensive Containment Cleanliness and Foreign Material Exclusion controls are established and maintained in Modes 4 through 1. Controls are also in place to maintain personnel, material, and tool accountability on any system or component opened for maintenance during the entire refueling outage. The reactor building refueling canal and reactor head area is controlled similarly throughout reactor head removal/replacement and refueling. These controls are implemented using administrative procedures.

A Selected Licensing Commitment (SLC) is implemented through administrative procedures that control materials which could have adverse impact to post-LOCA sump recirculation capability. The SLC requires, for every containment entry in Modes 4 through 1, surveillance of containment areas occupied or traversed during containment entry to verify that no potential debris sources exist that could impact operability of the containment emergency sump. It also requires periodic inspection of the accessible areas of containment for potential debris sources on a frequency of 18 months.

Modification Process

Duke's modification process currently includes an administrative procedure that directs the design and implementation of engineering changes to the plant. This procedure directs that engineering changes be evaluated for system interactions. As part of this evaluation, there is direction to include consideration of any potential adverse effect with regard to debris sources and/or debris transport paths associated with the containment sump.

While these existing controls provide assurance that modifications to the plant will be assessed for potential adverse affects on the containment sump, Duke plans to provide further evaluation to determine if additional controls are needed. Duke will identify any additional controls that may be needed regarding appropriately maintaining the validity of inputs to analyses that are being performed in resolving GSI-191 concerns.

Plant Labeling Process

Oconee has a site directive which requires that label installation materials be approved by engineering to ensure material compatibility. Restrictions are included on material types which can be used for labels inside containment. However, there is no requirement in this directive to document an engineering evaluation for potential

containment sump blockage and no provisions to ensure that our analytical limit on tape, tags, and stickers is not exceeded. Also, other signs in the reactor building (ie, RP postings, Housekeeping signs, etc) are not addressed in this directive. We have identified these programmatic weaknesses in our site corrective action program. Corrective measures will be in place by December 31, 2007.

2. NRC REQUEST:
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.

McGuire confirms that Emergency Core Cooling System (ECCS) and Containment Spray System recirculation functions under debris loading conditions will be in compliance with the regulatory requirements listed in the applicable Regulatory Requirements Section of this generic letter. The containment sump will be modified to increase the effective containment sump strainer area to a total of approximately 2,000 ft^2 of perforated plate with maximum 1/8 inch diameter perforations.

The design of the modified containment sump will accommodate the effects of debris loading as determined by the baseline evaluation, which is currently under review by Duke, and the ongoing refined evaluation for McGuire. These evaluations use the guidance of NEI 04-07, "Pressurized Water Reactor Sump Performance Evaluation Methodology, Revision 0" (NEI 04-07), dated December 2004. Enercon Services, Inc. has performed the baseline evaluation and is performing the refined evaluations for McGuire.

There is ongoing work in the area of chemical effects and the effects of operation with debris-laden fluids on downstream components. Should the ongoing analyses indicate a need for additional plant modifications, these will be implemented to ensure compliance with all applicable regulations. Status and schedule information are presented in Item 2 (b) below.

(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.

The corrective actions required by this Generic Letter will be completed on or before December 31, 2007 as follows:

1. A baseline evaluation has been performed for McGuire by Enercon Services, Inc. This evaluation was performed using the guidance of NEI 04-07. The evaluation is currently under review by McGuire and will be completed by June 30, 2006.

2. A refined evaluation using the guidance of NEI 04-07 will be completed for McGuire by Enercon Services, Inc. The evaluation is currently in progress and will be

completed by June 30, 2006. This evaluation will provide plant-specific refinements to the baseline evaluation that can be justified for McGuire. This evaluation is expected to provide additional head loss margin for the containment sump.

3. A downstream effects evaluation will be completed for McGuire by Enercon Services, Inc. This evaluation will be performed using the methodology provided by WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191," (WCAP-16406-P). The evaluation is currently in progress and will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

4. Chemical effects will be evaluated to confirm that sufficient margin exists in the final sump design to account for any associated head loss. The evaluation will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

5. A confirmatory walkdown of containment using the guidance of NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments" (NEI 02-01) was completed for McGuire Unit 2 in the Spring of 2005. A confirmatory walkdown of containment using the guidance of NEI 02-01 will be performed for McGuire Unit 1 in the Fall of 2005.

6. A confirmation of the conservatism of the 200 pound latent debris assumption used in the baseline analysis will be performed by latent debris surveys/sampling during the McGuire Unit 1 Fall refueling outage in 2005.

7. The plant labeling process will be enhanced to require that any additional labels or signs placed inside containment are evaluated to ensure that the design basis for transportable debris is not invalidated. This corrective action will be completed by December 31, 2007.

8. Testing will be performed to confirm that the replacement strainer head loss is acceptable under design basis debris loaded conditions. This testing will be conducted prior to installation of the replacement strainers.

9. A modified containment sump strainer and supporting structure will be installed in the Fall of 2006 for McGuire Unit 2 and in the Spring of 2007 for McGuire Unit 1.

10. Replacement of the Microtherm® insulation (currently installed on portions of the reactor vessel heads) will be completed in the Fall of 2006 for McGuire Unit 2 and in the Spring of 2007 for McGuire Unit 1. The replacement of this insulation will reduce the postulated post-accident debris loading on the sump strainer.

11. Duke will evaluate the modification process to determine if additional controls are needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns. This evaluation will be completed by June 30, 2006.

(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.)

McGuire has used the methodology contained in NEI 02-01 for assessment of potential debris sources inside containment. As noted in McGuire's response to Item 1 of GL 2004-02 submitted on March 1, 2005, a walkdown of Unit 2 was completed by Enercon Services, Inc. in the Spring of 2005. The results of this walkdown were documented in a debris assessment report. These results have been included as input to both the baseline and refined evaluations. A confirmatory walkdown of Unit 1 will be completed by Enercon in the Fall of 2005.

Susceptibility of the ECCS and Containment Spray System recirculation functions to the adverse effects of post-accident debris blockage and operation with debris-laden fluids will be evaluated using the methodology contained in NEI 04-07, as amended by the NRC SER for that methodology. The methodology for evaluation of debris blockage susceptibility includes consideration of debris generation, transport, and head loss across the sump strainer.

As discussed in Item 2(b), evaluation of downstream effects with debris-laden fluids is being performed utilizing the methodology provided in WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191."

Integrated Chemical Effects Testing (ICET) performed at the University of New Mexico has been on-going to identify the chemical reaction products that are intended to be representative of a PWR sump in a post-LOCA environment. This information, as well as any other publicly available chemical effects testing information, will be used to evaluate head loss effects of chemical precipitants.

(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.

When the ECCS and Containment Spray System pumps are operated with Residual Heat Removal and Containment Spray system suctions aligned to the containment sump, the available NPSH margin is 14 feet for the Containment Spray pumps and 15 feet for the Residual Heat Removal pumps.

(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.

For design basis accidents, the modified containment sump will be fully submerged at the initiation and throughout the entire period of recirculation. The area of the sump debris strainer will be approximately 2000 ft^2.

(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 analysis. 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.

The refined analysis will be completed by June 30, 2006. This analysis will determine the limiting break and therefore identify the primary constituents of the debris bed. Upon completion of the design for the replacement sump, the maximum head loss will be determined. This head loss will be less than the available NPSH margins.

(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.

Water inventory for containment sump operation is provided by a combination of the refueling water storage tank, cold leg accumulators and ice melt. Review of architectural design, supplemented by walkdowns conducted using the guidance of NEI 02-01, ensured that no choke points exist that would challenge the flow of containment water inventory to the containment sump.

The design of the McGuire containments is compartmentalized and provides diverse flow paths to the containment sump. Flowpaths include six 8-inch diameter refueling cavity drains and multiple penetrations (greater than 35) through the crane wall. An evaluation has been completed that assures the containment sump water level will be maintained adequately during ECCS recirculation when accounting for potential blockages and hold-up volumes associated with these flow paths.

(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.

An analysis of downstream effects will be completed using the methodology in WCAP-16406-P. This analysis will take into account the design of the new containment sump strainer perforations. The effects of debris penetrating the strainer on downstream equipment will be evaluated to confirm safety related functions will be fulfilled during ECCS recirculation.

Inspections of the sump strainer will continue to be performed each refueling outage pursuant to Technical Specification Surveillance Requirement 3.5.2.8 to ensure that the sump strainers are being maintained in an acceptable condition and that no adverse gaps or breaches exist.

(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.

As discussed in Item 2(c) above, an evaluation of downstream effects with debris-laden fluids is being performed utilizing the methodology provided in WCAP-16406-P. This analysis will evaluate ECCS and Containment Spray System components to confirm that they are not susceptible to plugging or excessive wear due to extended post-accident operation with debris-laden fluids. Corrective actions will be implemented if necessary.

(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.

The replacement sump strainer and trash racks will be designed to be structurally 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 analysis.

No active strategies for enhanced containment sump performance are planned for McGuire.

(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.

In conjunction with the implementation of the replacement containment sump strainers and the adoption of the revised licensing basis for sump debris loading assumptions, the UFSAR will be revised to reflect the new analysis and sump design as required by 10 CFR 50.71 (e).

Currently, no issues have been identified, and no issues are anticipated, that would indicate that a license amendment would be required in association with these UFSAR changes and planned modifications to resolve GSI-191. However, the associated

10 CFR 50.59 evaluations are not complete. Similarly, at this time no issues requiring an exemption request have been identified and none are anticipated.

Additional modifications may be identified by the evaluation of downstream effects. Any necessary modifications will be identified by June 30, 2006. There are no licensing actions or exemptions anticipated in association with addressing downstream effects.

(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 affects 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.

McGuire has several programmatic controls in place to ensure that potential sources of debris introduced into containment will be assessed for adverse effects on the ECCS and Containment Spray System recirculation functions. These programmatic controls include requirements related to coatings, containment housekeeping, materiel condition and modifications. Some programmatic controls are described in more detail below.

Coatings Program

As described in Duke's November 11, 1998 response to 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," Duke has established controls for the procurement, application, and maintenance of Service Level 1 protective coatings used inside the containment. The requirements of 10 CFR 50, Appendix B are implemented through the specification of appropriate technical and quality requirements for the Service Level 1 coatings program. For Service Level 1 coatings, Duke is committed to comply with Regulatory Guide 1.54 at McGuire. As described in the Generic Letter 98-04 response, vendor-coated mechanical and electrical equipment coatings are considered unqualified.

Containment Housekeeping/Materiel Condition

Duke's August 7, 2003 response to Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," described planned actions regarding containment cleanliness. These actions have been implemented and involve containment cleaning and visual inspections.

Extensive containment cleaning is performed during refueling outages using water spray, vacuuming, and hand wiping. In general, this is limited to the space in lower containment that would be submerged under large break LOCA conditions. Additionally, localized washdowns are performed as needed. Visual inspections are performed on the remaining areas of containment. Foreign material is removed as necessary. Material accountability logs are maintained in Modes 1 through 4 for items

carried into and out of containment. These controls are implemented using administrative procedures.

Modification Process

Duke's modification process currently includes an administrative procedure that directs the design and implementation of engineering changes to the plant. This procedure directs that engineering changes be evaluated for system interactions. As part of this evaluation, there is direction to include consideration of any potential adverse effect with regard to debris sources and/or debris transport paths associated with the containment sump.

While these existing controls provide assurance that modifications to the plant will be assessed for potential adverse affects on the containment sump, Duke plans to provide further evaluation to determine if additional controls are needed. Duke's will identify any additional controls that may be needed regarding appropriately maintaining the validity of inputs to analyses that are being performed in resolving GSI-191 concerns.

Plant Labeling Process

The plant labeling process will be enhanced to ensure that any additional labels or signs placed inside containment are evaluated to ensure that the design basis for transportable debris is not invalidated. This corrective active will be completed by December 31, 2007.

2. NRC REQUEST:
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.

Catawba confirms that Emergency Core Cooling System (ECCS) and Containment Spray System recirculation functions under debris loading conditions will be in compliance with the regulatory requirements listed in the applicable Regulatory Requirements Section of this generic letter. The containment sump will be modified to increase the effective containment sump strainer area to a total of approximately 2,000 ft^2 of perforated plate with maximum 1/8 inch diameter perforations.

The design of the modified containment sump will accommodate the effects of debris loading as determined by the baseline evaluation, which is currently under review by Duke, and the ongoing refined evaluation for Catawba. These evaluations use the guidance of NEI 04-07, "Pressurized Water Reactor Sump Performance Evaluation Methodology, Revision 0" (NEI 04-07), dated December 2004. Enercon Services, Inc. has performed the baseline evaluation and is performing the refined evaluations for Catawba.

There is ongoing work in the area of chemical effects and the effects of operation with debris-laden fluids on downstream components. Should the ongoing analyses indicate a need for additional plant modifications, these will be implemented to ensure compliance with all applicable regulations. Status and schedule information are presented in Item 2 (b) below.

(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.

The corrective actions required by this Generic Letter will be completed on or before December 31, 2007 as follows:

1. A baseline evaluation has been performed for Catawba by Enercon Services, Inc. This evaluation was performed using the guidance of NEI 04-07. The evaluation is currently under review by Catawba and will be completed by June 30, 2006.

2. A refined evaluation using the guidance of NEI 04-07 will be completed for Catawba by Enercon Services, Inc. The evaluation is currently in progress and will be

completed by June 30, 2006. This evaluation will provide plant-specific refinements to the baseline evaluation that can be justified for Catawba. This evaluation is expected to provide additional head loss margin for the containment sump.

3. A downstream effects evaluation will be completed for Catawba by Enercon Services, Inc. This evaluation will be performed using the methodology provided by WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191," (WCAP-16406-P). The evaluation is currently in progress and will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

4. Chemical effects will be evaluated to confirm that sufficient margin exists in the final sump design to account for any associated head loss. The evaluation will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

5. Confirmatory walkdowns of containment using the guidance of NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments" (NEI 02-01) were completed for Catawba Unit 2 in the Fall of 2004 and for Catawba Unit 1 in the Spring of 2005.

6. A confirmation of the conservatism of the 200 pound latent debris assumption used in the baseline analysis will be performed by latent debris surveys/sampling during the Catawba Unit 2 Spring refueling outage in 2006.

7. The plant labeling process will be enhanced to require that any additional labels or signs placed inside containment are evaluated to ensure that the design basis for transportable debris is not invalidated. This corrective action will be completed by December 31, 2007.

8. Testing will be performed to confirm that the replacement strainer head loss is acceptable under design basis debris loaded conditions. This testing will be conducted prior to installation of the replacement strainers.

9. A modified containment sump strainer and supporting structure will be installed in the Fall of 2006 for Catawba Unit 1 and in the Fall of 2007 for Catawba Unit 2.

10. Replacement of the Microtherm® insulation (currently installed on portions of the reactor vessel heads) will be completed in the Fall of 2006 for Catawba Unit 1 and in the Fall of 2007 for Catawba Unit 2. The replacement of this insulation will reduce the postulated post-accident debris loading on the sump strainer.

11. Duke will evaluate the modification process to determine if additional controls are needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns. This evaluation will be completed by June 30, 2006.

(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.)

Catawba has used the methodology contained in NEI 02-01 for assessment of potential debris sources inside containment. As noted in Catawba's response to Item 1 of GL 2004-02 submitted on March 1, 2005, a walkdown of Unit 2 was completed by Enercon Services, Inc. in the Fall of 2004. The results of this walkdown were documented in a debris assessment report, which is under review with the associated baseline evaluation. These results have been included as input to both the baseline and refined evaluations. A subsequent confirmatory walkdown of Unit 1 was completed by Enercon in the Spring of 2005.

Susceptibility of the ECCS and Containment Spray System recirculation functions to the adverse effects of post-accident debris blockage and operation with debris-laden fluids will be evaluated using the methodology contained in NEI 04-07, as amended by the NRC SER for that methodology. The methodology for evaluation of debris blockage susceptibility includes consideration of debris generation, transport, and head loss across the sump strainer.

As discussed in Item 2(b), evaluation of downstream effects with debris-laden fluids is being performed utilizing the methodology provided in WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191."

Integrated Chemical Effects Testing (ICET) performed at the University of New Mexico has been on-going to identify the chemical reaction products that are intended to be representative of a PWR sump in a post-LOCA environment. This information, as well as any other publicly available chemical effects testing information, will be used to evaluate head loss effects of chemical precipitants.

(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.

When the ECCS and Containment Spray System pumps are operated with Residual Heat Removal and Containment Spray system suctions aligned to the containment sump, the available NPSH margin with an unblocked sump strainer is 7 feet for the Containment Spray pumps and 14 feet for the Residual Heat Removal pumps.

(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.

For design basis accidents, the modified containment sump will be fully submerged throughout the entire period of recirculation flow. The area of the sump debris strainer will be approximately 2,000 ft^2.

(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 analysis. 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.

The refined analysis will be completed by June 30, 2006. This analysis will determine the limiting break and therefore identify the primary constituents of the debris bed. Upon completion of the design for the replacement sump, the maximum head loss will be determined. This head loss will be less than the available NPSH margins.

(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.

Water inventory for containment sump operation is provided by a combination of the refueling water storage tank, cold leg accumulators and ice melt. Review of architectural design, supplemented by walkdowns conducted using the guidance of NEI 02-01, ensured that no choke points exist that would challenge the flow of containment water inventory to the containment sump.

The design of the Catawba containments is compartmentalized and provides diverse flow paths to the containment sump. Flowpaths include six 8-inch diameter refueling cavity drains and multiple penetrations (greater than 35) through the crane wall. The refined analysis demonstrating that the containment sump water level will be maintained adequately during ECCS recirculation when accounting for potential blockages and hold-up volumes associated with these flow paths will be completed by June 30, 2006.

(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.

As discussed above, an analysis of downstream effects will be completed using the methodology in WCAP-16406-P. This analysis will take into account the design of the new containment sump strainer perforations. The effects of debris penetrating the strainer on downstream equipment will be evaluated to confirm safety related functions will be fulfilled during ECCS recirculation.

Inspections of the sump strainer will continue to be performed each refueling outage pursuant to Technical Specification Surveillance Requirement 3.5.2.8 to ensure that the

sump strainers are being maintained in an acceptable condition and that no adverse gaps or breaches exist.

(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.

As discussed in Item 2(c) above, an evaluation of downstream effects with debris-laden fluids is being performed utilizing the methodology provided in WCAP-16406-P. This analysis will evaluate ECCS and Containment Spray System components to confirm that they are not susceptible to plugging or excessive wear due to extended post-accident operation with debris-laden fluids. Corrective actions will be implemented if necessary.

(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.

The replacement sump strainer and trash racks will be designed to be structurally 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 analysis.

No active strategies for enhanced containment sump performance are planned for Catawba.

(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.

In conjunction with the implementation of the replacement containment sump strainers and the adoption of the revised licensing basis for sump debris loading assumptions, the UFSAR will be revised to reflect the new analysis and sump design as required by 10 CFR 50.71 (e).

Currently, no issues have been identified, and no issues are anticipated, that would indicate that a license amendment would be required in association with these UFSAR changes and planned modifications to resolve GSI-191. However, the associated 10 CFR 50.59 evaluations are not complete, these evaluations will be completed after the designs are finalized. Similarly, at this time no issues requiring an exemption request have been identified and none are anticipated.

Additional modifications may be identified by the evaluation of downstream effects. Any necessary modifications will be identified by June 30, 2006. There are no licensing actions or exemptions anticipated in association with addressing downstream effects.

(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 affects 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.

Catawba has several programmatic controls in place to ensure that potential sources of debris introduced into containment will be assessed for adverse effects on the ECCS and Containment Spray System recirculation functions. These programmatic controls include requirements related to coatings, containment housekeeping, materiel condition and modifications. Some programmatic controls are described in more detail below.

Coatings Program

As described in Duke's November 11, 1998 response to 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," Duke has established controls for the procurement, application, and maintenance of Service Level 1 protective coatings used inside the containment. The requirements of 10 CFR 50, Appendix B are implemented through the specification of appropriate technical and quality requirements for the Service Level 1 coatings program. For Service Level 1 coatings, Duke is committed to comply with Regulatory Guide 1.54 at Catawba. Per the GL 98-04 response, vendor supplied mechanical equipment (valves, pumps, hoists, tanks, etc.) that was procured prior to the issuance of Reg Guide 1.54 (or that are impractical to purchase with qualified coatings) all have coatings that cannot be certified to comply with the standards, and are thus defined as unqualified.

Containment Housekeeping/Materiel Condition

Duke's August 7, 2003 response to Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors," described planned actions regarding containment cleanliness. These actions have been implemented and involve containment cleaning and visual inspections.

Extensive containment cleaning is performed during refueling outages using water spray, vacuuming and hand wiping. In general, this is limited to the space in lower containment that would be submerged under large break LOCA conditions. Additionally, localized washdowns are performed as needed. Visual inspections are performed on the remaining areas of containment. Foreign material is removed as necessary. Material accountability logs are maintained in Modes 1 through 4 for items

carried into and out of containment. These controls are implemented using administrative procedures.

Modification Process

Duke's modification process currently includes an administrative procedure that directs the design and implementation of engineering changes to the plant. This procedure directs that engineering changes be evaluated for system interactions. As part of this evaluation, there is direction to include consideration of any potential adverse effect with regard to debris sources and/or debris transport paths associated with the containment sump.

While these existing controls provide assurance that modifications to the plant will be assessed for potential adverse affects on the containment sump, Duke plans to provide further evaluation to determine if additional controls are needed. Duke will identify any additional controls that may be needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns.

Plant Labeling Process

The plant labeling process will be enhanced to ensure that any additional labels or signs placed inside containment are evaluated to ensure that the design basis for transportable debris is not invalidated. This corrective action will be completed by December 31, 2007.

Attachment 4
Commitments
Generic Letter 2004-02 Response

Oconee Nuclear Station GL 2004-02 Commitments

1. A baseline evaluation has been performed for Oconee by ENERCON Services, Inc. This evaluation was performed using the guidance of NEI 04-07, "Pressurized Water Reactor Sump Performance Evaluation Methodology, Revision 0" (NEI 04-07) as amended by the NRC SER for that methodology. The evaluation is currently under review by Oconee and will be complete by June 30, 2006.

2. A downstream effects evaluation will be completed for Oconee by Stone & Webster. This evaluation will be performed using the methodology provided by WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191," (WCAP-16406-P). Some exceptions to the WCAP-16406-P methodology may be taken. The evaluation is currently in progress and will be complete by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

3. Chemical effects will be evaluated to confirm that sufficient margin exists in the final sump design to account for this head loss. The evaluation will be complete by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

4. A modified containment sump strainer and supporting structure will be installed in the fall of 2005 for Oconee Unit 2, the spring of 2006 for Oconee Unit 3 and the fall of 2006 for Oconee Unit 1.

5. A walkdown of containment using the guidance of NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments" was completed for Oconee Unit 3 in the fall of 2004 and a confirmatory walkdown of Unit 1 was completed in the spring of 2005. A similar confirmatory walkdown will be performed for Unit 2 in the fall of 2005.

6. The plant labeling process will be enhanced to ensure that any additional labels or signs placed inside containment are evaluated to ensure that potential debris sources are evaluated for impact to RBES/ECCS function. This corrective action will be completed by December 31, 2007.

7. Enhancements will be made to the Oconee coatings program. These enhancements include: increased programmatic control to clearly document and trend evaluations performed on degraded coatings and to ensure that potential coating debris is evaluated for impact on ECCS and Reactor Building Emergency Sump function. This corrective action will be completed by December 31, 2007.

8. Fibrous insulation installed on the cooling water piping associated with each unit's 'B' Auxiliary Reactor Building Cooling Unit will be removed. This insulation removal is complete for Unit 1. The insulation will be removed in the fall of 2005 for Unit 2 and the spring of 2006 for Unit 3.

9. Duke will evaluate the modification process to determine if additional controls are needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns. This evaluation will be completed by June 30, 2006.

Attachment 5
Commitments
Generic Letter 2004-02 Response

McGuire Nuclear Station GL 2004-02 Commitments

1. A baseline evaluation has been performed for McGuire by Enercon Services, Inc. This evaluation was performed using the guidance of NEI 04-07. The evaluation is currently under review by McGuire and will be completed by June 30, 2006.

2. A refined evaluation using the guidance of NEI 04-07 will be completed for McGuire by Enercon Services, Inc. The evaluation is currently in progress and will be completed by June 30, 2006. This evaluation will provide plant-specific refinements to the baseline evaluation that can be justified for McGuire. This evaluation is expected to provide additional head loss margin for the containment sump.

3. A downstream effects evaluation will be completed for McGuire by Enercon Services, Inc. This evaluation will be performed using the methodology provided by WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191," (WCAP-16406-P). The evaluation is currently in progress and will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

4. Chemical effects will be evaluated to confirm that sufficient margin exists in the final sump design to account for any associated head loss. The evaluation will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

5. A confirmatory walkdown of containment using the guidance of NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments" (NEI 02-01) was completed for McGuire Unit 2 in the Spring of 2005. A confirmatory walkdown of containment using the guidance of NEI 02-01 will be performed for McGuire Unit 1 in the Fall of 2005.

6. A confirmation of the conservatism of the 200 pound latent debris assumption used in the baseline analysis will be performed by latent debris surveys/sampling during the McGuire Unit 1 Fall refueling outage in 2005.

7. The plant labeling process will be enhanced to require that any additional labels or signs placed inside containment are evaluated to ensure that the design basis for transportable debris is not invalidated. This corrective action will be completed by December 31, 2007.

8. Testing will be performed to confirm that the replacement strainer head loss is acceptable under design basis debris loaded conditions. This testing will be conducted prior to installation of the replacement strainers.

9. A modified containment sump strainer and supporting structure will be installed in the Fall of 2006 for McGuire Unit 2 and in the Spring of 2007 for McGuire Unit 1.

10. Replacement of the Microtherm® insulation (currently installed on portions of the reactor vessel heads) will be completed in the Fall of 2006 for McGuire Unit 2 and in the Spring of 2007 for McGuire Unit 1. The replacement of this insulation will reduce the postulated post-accident debris loading on the sump strainer.

11. Duke will evaluate the modification process to determine if additional controls are needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns. This evaluation will be completed by June 30, 2006.

Attachment 6
Commitments
Generic Letter 2004-02 Response

Catawba Nuclear Station GL 2004-02 Commitments

1. A baseline evaluation has been performed for Catawba by Enercon Services, Inc. This evaluation was performed using the guidance of NEI 04-07. The evaluation is currently under review by Catawba and will be completed by June 30, 2006.

2. A refined evaluation using the guidance of NEI 04-07 will be completed for Catawba by Enercon Services, Inc. The evaluation is currently in progress and will be completed by June 30, 2006. This evaluation will provide plant-specific refinements to the baseline evaluation that can be justified for Catawba. This evaluation is expected to provide additional head loss margin for the containment sump.

3. A downstream effects evaluation will be completed for Catawba by Enercon Services, Inc. This evaluation will be performed using the methodology provided by WCAP-16406-P, "Evaluation of Downstream Sump Debris Effects in Support of GSI 191," (WCAP-16406-P). The evaluation is currently in progress and will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

4. Chemical effects will be evaluated to confirm that sufficient margin exists in the final sump design to account for any associated head loss. The evaluation will be completed by June 30, 2006. Any additional plant modifications or procedure changes associated with this evaluation will be completed by December 31, 2007.

5. Confirmatory walkdowns of containment using the guidance of NEI 02-01, "Condition Assessment Guidelines: Debris Sources Inside PWR Containments" (NEI 02-01) were completed for Catawba Unit 2 in the Fall of 2004 and for Catawba Unit 1 in the Spring of 2005.

6. A confirmation of the conservatism of the 200 pound latent debris assumption used in the baseline analysis will be performed by latent debris surveys/sampling during the Catawba Unit 2 Spring refueling outage in 2006.

7. The plant labeling process will be enhanced to require that any additional labels or signs placed inside containment are evaluated to ensure that the design basis for transportable debris is not invalidated. This corrective action will be completed by December 31, 2007.

8. Testing will be performed to confirm that the replacement strainer head loss is acceptable under design basis debris loaded conditions. This testing will be conducted prior to installation of the replacement strainers.

Attachment 6
Commitments
Generic Letter 2004-02 Response

9. A modified containment sump strainer and supporting structure will be installed in the Fall of 2006 for Catawba Unit 1 and in the Fall of 2007 for Catawba Unit 2.

10. Replacement of the Microtherm® insulation (currently installed on portions of the reactor vessel heads) will be completed in the Fall of 2006 for Catawba Unit 1 and in the Fall of 2007 for Catawba Unit 2. The replacement of this insulation will reduce the postulated post-accident debris loading on the sump strainer.

11. Duke will evaluate the modification process to determine if additional controls are needed in order to maintain the validity of inputs to analyses performed in resolving GSI-191 concerns. This evaluation will be completed by June 30, 2006.