

August 18, 2005

Mrs. Mary G. Korsnick
Vice President R.E. Ginna Nuclear Power Plant
R. E. Ginna Nuclear Power Plant, LLC
1503 Lake Road
Ontario, NY 14519-9364

SUBJECT: R. E. GINNA NUCLEAR POWER PLANT - RESPONSE TO NRC BULLETIN 2003-01, "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY SUMP RECIRCULATION AT PRESSURIZED-WATER REACTORS" (TAC NO. MB9555)

Dear Mrs. Korsnick:

On June 9, 2003, the Nuclear Regulatory Commission (NRC) issued Bulletin (BL) 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors." This letter acknowledges receipt of the response from Rochester Gas and Electric (the former licensee) dated August 8, 2003, as supplemented by letters on November 8 and December 23, 2004, and April 14, 2005, from Ginna Nuclear Power Plant, LLC (the licensee), for the Ginna Nuclear Power Plant (Ginna). The November 8 supplement provided information in response to a request for additional information (RAI) dated September 9, 2004, from the NRC staff. In BL 2003-01, the NRC requested that all pressurized-water reactor (PWR) licensees provide a response, within 60 days of the date of BL, to either Option 1 or Option 2 as follows:

- Option 1: State that the emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions have been analyzed with respect to the potentially adverse post-accident debris blockage effects identified in this bulletin, taking into account the recent research findings described in the Discussion section, and are in compliance with all existing applicable regulatory requirements.
- Option 2: Describe any interim compensatory measures that have been implemented or that will be implemented to reduce the risk which may be associated with potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance is complete. If any of the interim compensatory measures listed in the Discussion section will not 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 their implementation is not practical until a later date.

In this regard, the licensee provided a response to BL 2003-01 Option 2.

In BL 2003-01, the NRC staff discussed 6 categories of possible interim compensatory measures (ICMs):

- (1) operator training on indications of and responses to sump clogging;
- (2) procedural modifications if appropriate, that would delay the switchover to containment sump recirculation (e.g., shutting down redundant pumps that are not necessary to provide required flows to cool the containment and reactor core, and operating the CSS intermittently);
- (3) ensuring that alternative water sources are available to refill the refueling water storage tank (RWST) or to otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere;
- (4) more aggressive containment cleaning and increased foreign material controls;
- (5) ensuring containment drainage paths are unblocked; and
- (6) ensuring sump screens are free of adverse gaps and breaches.

In the August 8, 2003, response, the licensee provided the current status of its implementation and any additional planned activities as follows:

- (1) during the Operator Requalification Cycle 2003-01 ending April 5, 2003, Ginna Station licensed operators received classroom and simulator training on the containment recirculation sump clogging issue, including debris sources, sump design, sump blockage issue history, indications of sump blockage, operator responses to sump blockage, and practical simulator training - ICM category #1;
- (2) procedural control of recirculation flow rates to less than 1500 gpm for each operating residual heat removal (RHR) pump to decrease the amount of debris that could be transported to the sump screens - ICM category #1;
- (3) for small- to medium-loss-of-coolant accident (LOCAs), procedural guidance exists to delay depletion of the RWST before switchover to sump recirculation, including actions to cooldown and depressurize the reactor coolant system (RCS) to reduce break flow (thereby reducing injection flow necessary to maintain RCS subcooling and inventory), and sequential stopping of safety injection (SI) pumps based on pre-established criteria that maintain core cooling, resulting in less outflow from the RWST (for smaller LOCAs cold shutdown can be attained before switchover) - ICM category #2;
- (4) procedural direction to refill the RWST once it has been determined that a loss of sump recirculation exists (not assumed in the safety analysis or plant design basis, and introduces the potential for containment flooding and loss of instrumentation and equipment inside containment) - ICM category #3;

- (5) an existing aggressive proceduralized program to maintain containment cleanliness and foreign material control, thereby managing dust, dirt and debris inside containment - ICM category #4;
- (6) proceduralized inspections to ensure that containment drainage paths to the sump are unblocked, and no unrestrained items are placed such that they could block a drainage path - ICM category #5; and
- (7) proceduralized evaluation of the sump screens for adverse gaps or breaches - ICM category #6.

In addition, the licensee stated in the August 8, 2003, response that it would implement the following ICMs:

- (1) investigate the possibility of modifying the existing low-loop, non-power operations residual heat removal (RHR) net-positive suction head (NPSH) calculation instrumentation to reduce the risk associated with operator diagnoses of sump fouling and subsequent follow-up actions (detailed technical evaluations to be completed by December 31, 2003, feasible modifications with procedural and training changes by December 31, 2004) - ICM category #1;
- (2) containment cleanliness assessments to be performed prior to startup from the next refueling outage (then scheduled for October 2003) - ICM category #4;
- (3) additional efforts to be completed prior to startup from the October 2003, refueling outage to quantify and remove paper equipment tags, weak tie wraps, and other sources of debris - ICM category #4; and
- (4) additional inspection to confirm that there are no adverse gaps or breaches in the sump screens (to be completed prior to startup from the refueling outage scheduled to begin October 2003 - ICM category #6.

The licensee further stated that, after the generic Westinghouse Owner's Group (WOG) guidance on sump blockage (WCAP-16204, "Evaluation of Potential ERG [Emergency Response Guideline] and EPG [Emergency Procedure Guideline] Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085), Revision 1") was approved and issued, Ginna LLC would evaluate which changes, if any, were appropriate to Ginna station's configuration. The licensee stated that it would complete this activity by October 31, 2004, and provide the NRC with a detailed implementation schedule or inform the NRC staff if it was determined that no additional changes were required.

In a November 8, 2004, RAI response, the licensee discussed the following considerations and actions:

- (1) addition of a new post-LOCA procedural step directing operators to monitor for signs of sump blockage, reduce flow as low as possible, and consult with the Technical Support Center (TSC) - ICM category #1;

- (2) existing procedures require that if recirculation capability is lost, seven separate categories of actions are identified as responses: continued attempts to restore recirculation, attempts to increase RWST level, initiation of cooldown to cold shutdown, RCS depressurization, alternate source RCS makeup, steam generator cooldown and depressurization, and RCS heat removal maintenance - ICM category #1;
- (3) selected Candidate Operator Actions (COAs) from WCAP-16204, Revision 1 (as discussed below);
- (4) a change to the step sequence in ES-1.3 such that existing steps that stop one RHR pump, all but one spray pump, and all but two SI pumps, are moved to earlier in the procedure (expected to extend the time until switchover to sump recirculation while still providing adequate injection flow) - ICM category #2; and
- (5) a change to ES-1.3 which starts one, instead of two, RHR pumps at recirculation initiation at less than full flow (expected to reduce debris transport during sump recirculation) - ICM category #1.

With respect to the COAs in WCAP-16204, Revision 1, the licensee stated that:

- (1) COA 1A, "Operator Action to Secure One Spray Pump," and COA 1B, "Operator Action to Secure Both Spray Pumps," appeared to be acceptable at Ginna, but significant analysis must yet be performed before implementation can be accomplished (listing a number of reasons relating to containment chemistry and operating environment), with study performed in the first quarter of CY 2005, and implementation to be considered following evaluation of results against accident analysis design and licensing basis - ICM category #2;
- (2) COA 5, "Refill of Refueling Water Storage Tank," (upon switchover to recirculation) is contained in the new out-of-ERG-network Sump Blockage Control Room Guideline (SBCRG) which, pending the required analyses, reviews and approvals, Ginna will implement - ICM category #3;
- (3) COA 8, "Provide Guidance on Symptoms and Identification of Containment Sump Blockage," will be accomplished through transitional steps to the loss of recirculation procedure based on RHR pump cavitation, erratic motor current and discharge flow - ICM category #1;
- (4) COA 9, "Develop Contingency Actions in Response to Containment Sump Blockage, Loss of Suction, and Cavitation," is contained in the new SBCRG which, pending the required analyses, reviews and approvals, Ginna will implement - ICM category #1.

The NRC staff understands that all of the COA-related and ES 1.3-related changes discussed above are targeted for implementation by August 1, 2005, based on a December 23, 2004, letter.

In an April 14, 2005, response to a March 16, 2005, phone conversation with the NRC staff, the licensee elaborated on its considerations regarding WOG COAs 2, 3, 4, 6, 7, 10, and 11. Specifically, the licensee stated that for:

- (1) COA 2, "Manually Establish One Train of Containment Sump Recirculation Prior to Automatic Actuation," the Ginna design is such that ECCS cannot have one train aligned for recirculation while the second train is aligned for injection, and that, therefore, COA 2 is not applicable to Ginna;
- (2) COA 3, "Terminate One Train of Safety Injection after Recirculation Alignment," the Ginna emergency operating procedures stop all high head SI pumps upon switchover to sump recirculation, and initially start the RHR (low head SI) pumps (with restart of the high head SI pumps only if core cooling is insufficient), and that Ginna is considering starting only one RHR pump during initial sump recirculation, and that these actions are equivalent to the WOG recommendations of COA 3 - ICM category #1;
- (3) COA 4, "Early Termination of One LPSI/RHR Pump Prior to Recirculation Alignment," as discussed in your November 8, 2004, response, Ginna is considering moving a step sequence that stops RHR pumps, all but one spray pump, and all but two SI pumps to earlier in procedure ES 1.3, expecting this change to extend the time until sump recirculation is established - ICM category #2;
- (4) COA 6, "Inject More than One RWST Volume from a Refilled RWST or by Bypassing the RWST," the new Ginna-specific version of the WOG SBCRG includes this action - ICM category #3;
- (5) COA 7, "Provide More Aggressive Cooldown and Depressurization Following a Small Break LOCA," Ginna's Westinghouse ERGs already address maximizing the cooldown rate up to Technical Specifications limits - ICM category #2;
- (6) COA 10, "Early Termination of One Train of HPSI/High-Head Injection Prior to Recirculation Alignment," this COA is applicable only to CE plants;
- (7) COA 11, "Prevent or Delay Containment Spray for Small Break LOCAs (<1 Inch Diameter) in Ice Condenser Plants," Ginna is not an ice condenser containment plant and this COA is, therefore, not applicable.

In a July 25, 2005, e-mail, the licensee stated that Ginna intends to implement WOG COA 1A, "Operator Action to Secure one Spray Pump" (before switchover to sump recirculation).

The NRC staff has considered the licensee's response to Option 2 for compensatory measures that were or were to have been implemented to reduce the interim risk associated with potentially degraded or nonconforming ECCS and CSS recirculation functions. Based on the response, the NRC staff considers these actions to be responsive to and meet the intent of BL 2003-01. The NRC staff requests that the licensee retain any records of its actions in response to BL 2003-01, as the NRC staff may conduct subsequent inspection activities regarding this issue.

M. Korsnick

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Should you have any questions, please contact me at 301-415-1457 or the lead project manager for this issue, Alan Wang, at 301-415-1445.

Sincerely,

/RA/

Patrick D. Milano, Sr. Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-244

cc: See next page

M. Korsnick

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Should you have any questions, please contact me at 301-415-1457 or the lead project manager for this issue, Alan Wang, at 301-415-1445.

Sincerely,

/RA/

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