

August 8, 2003

Mr. Robert L. Clark  
Office of Nuclear Regulatory Regulation  
U. S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555-0001

Subject: 60 Day Response to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized-Water Reactors"  
R.E. Ginna Nuclear Power Plant  
Docket No. 50-244

Dear Mr. Clark,

The U. S. Nuclear Regulatory Commission (NRC) issued NRC Bulletin 2003-01 to inform licensees of the potential for additional adverse effects due to debris blockage of flowpaths necessary for Emergency Core Cooling System (ECCS) and Containment Spray System (CSS) recirculation and containment drainage. These additional adverse effects were based on NRC sponsored research that identified the potential susceptibility of pressurized-water reactor (PWR) recirculation sump screens to debris blockage in the event of a high energy line break (HELB) that would require ECCS and CSS operation in the recirculation mode.

All licensees were requested to provide a response with 60 days of the date of the NRC Bulletin to either:

- 1) 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 NRC Bulletin and are in compliance with all existing applicable regulatory requirements (Option 1), or
- 2) Describe any interim compensatory measures that have been or will be implemented to reduce the risk which may be associated with the potentially degraded or nonconforming ECCS and CSS recirculation functions until an evaluation to determine compliance has been completed (Option 2).

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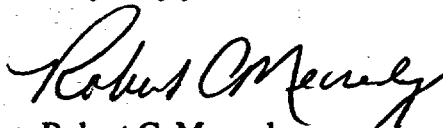
The attachment to this letter contains the Rochester Gas and Electric Corporation (RG&E) response to Bulletin 2003-01 with respect to the R.E. Ginna Nuclear Power Plant. Specifically, this response documents the information associated with Option 2.

I declare under penalty of perjury under the laws of the United States of America that I am authorized by Rochester Gas and Electric Corporation to make this request and that the foregoing is true and correct.

If you should have any question regarding this submittal, please contact Mr. Brian Flynn, Manager, Primary Reactor Systems at phone number 585-771-3734.

Very truly yours,

Executed on August 8, 2003

  
Robert C. Mecredy

- Attachments: 1. NRC Bulletin 2003-01 Requested Information  
2. List of Regulatory Commitments incurred

xc: Mr. Robert L. Clark (Mail Stop O-8-E9)  
Project Directorate I-1  
Division of Reactor Projects - I/II  
Office of Nuclear Regulatory Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Regional Administrator, Region I  
U.S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

U.S. NRC Ginna Senior Resident Inspector

**Attachment 1**

**Option 2 Response to NRC Bulletin 2003-01**

This response addresses Option 2 of the requested information specified in NRC Bulletin 2003-01. As required, this response addresses the six (6) interim compensatory measures addressed in the Bulletin. For each item, a status of its implementation is also provided.

### **1. Operator and staff training on indications of and responses to sump clogging**

#### **Current Status**

During Operator Requalification Cycle 2003-2 (2/24/03 - 4/5/03), the Ginna Station Licensed Operators received classroom and simulator training on the containment (CNMT) recirculation sump clogging issue. The classroom training was conducted under lesson plan TAPOP0302C, CNMT SUMP BLOCKAGE. The areas covered in this lesson were as follows:

- 1) What is the concern with Recirculation Sump Clogging?
  - a) This topic discussed loss of flow during recirculation due to sump blockage and,
  - b) Equipment damage due to entrained debris
- 2) Where does the debris come from?
  - a) This topic discussed the sources of debris including labeling and placecards, protective coatings, thermal insulation, fire barrier material, and other fibrous material that could be dislodged during a loss of coolant accident (LOCA).
- 3) CNMT recirculation sump design
  - a) This topic was a brief review of the design of the recirculation sump, the sump screens, and how the screens functioned to remove debris from the recirculation water.
- 4) Review of the History of the Sump Blockage Issues
  - a) This topic reviewed various correspondence including NRC Generic Letters 85-22 and 98-04, Information Notices (IN) 90-07, 95-06, and 97-13, Bulletin 93-02, and Generic Safety Issue (GSI) - 191
- 5) Indications of Sump Blockage
  - a) This topic reviewed information available on the plant process computer (e.g., RHR motor currents) and the main control board (e.g., RHR pump discharge flows).
- 6) Operator response to sump blockage
  - a) This topic reviewed changes to Emergency Operating Procedure (EOP) ES-1.3, "Transfer to Cold Leg Recirculation." Specifically, a new step was added to address operator actions for sump blockage including:
    - (1) If blockage is indicated reduce flow to minimum for decay heat removal
    - (2) Consult with the Technical Support Center (TSC) for further actions.

In addition to the above classroom training, simulator training was also conducted on CNMT sump blockage using Simulator Scenario 03-02-03. The Ginna simulator has a feature which allows simulation of plugging of the sump screens. This feature was utilized to show the operators the indications of sump screen blockage and to allow them to respond using the revised

procedure ES-1.3 as discussed above.

#### Additional Planned Activities

During the reviews performed in response to Bulletin 2003-01 the possibility of modifying the existing Residual Heat Removal (RHR) NPSH calculation instrumentation configuration was identified as a change which could reduce the risk associated with operator diagnoses of sump fouling and subsequent follow up actions. This instrumentation (currently used only during low loop, non-power operations) has the potential, after modification, for availability and use as a non-safety related sump fouling diagnostic tool following a loss of coolant accident. Detailed technical evaluations are scheduled to be completed by December 31, 2003. If the modifications are feasible, the change will be implemented, including operating procedure changes and operator training, by December 31, 2004.

#### Plant Specific Information Appropriate for Staff Consideration

The Staff should note that contrary to the 5600 gpm RHR flow rates assumed for the configuration matching Ginna Station in NUREG/CR-6762, actual flow rates are controlled to less than 1500 gpm per operating RHR pump (maximum of 3000 gpm total flow) per procedure ES-1.3, "Transfer to Cold Leg Recirculation." This lower flow rate during the recirculation phase would decrease the amount of debris that could be transported to the sump screens due to reduced flow velocities at the containment basement level.

#### **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)**

#### Current Status

RG&E has performed a review to identify procedural modifications that could be implemented to delay switchover to sump recirculation following a large break LOCA. No immediate compensatory procedural modifications that have the potential to delay switchover to sump recirculation have been identified that did not have adverse risk consequences. The Ginna Stations accident mitigation strategy does not allow actions on large break LOCAs that would delay refueling water storage tank (RWST) inventory depletion. Guidance to delay depletion of the RWST after switchover to sump recirculation is currently contained in procedure ECA-1.1, "Loss of Emergency Coolant Recirculation." This procedure provides actions to reduce the outflow from the RWST to preserve the RWST inventory once it has been determined that a loss of sump recirculation capability exists. The procedure determines the actions necessary for delaying RWST inventory depletion, while ensuring that adequate core cooling flow and containment heat removal is maintained as necessary. It is important to note that procedure ES-1.3 has been revised to include a step to diagnose sump blockage using available indications as described above in the response to interim compensatory measure #1. The required action if blockage is identified is to reduce flow consistent with the guidance in procedure ECA-1.1. Furthermore, procedure ES-1.3 includes instruction to transition to ECA-1.1 in the event

recirculation capability is lost. Increasing the level in the RWST is considered only if the operators have transitioned to ECA-1.1.

For small to medium LOCAs, guidance to delay depletion of the RWST before switchover to sump recirculation currently exists in procedure ES-1.2, "Post LOCA Cooldown and Depressurization". This procedure provides actions to cooldown and depressurize the reactor coolant system (RCS) to reduce the break flow, thereby reducing the injection flow necessary to maintain RCS subcooling and inventory. The operating safety injection (SI) pumps are sequentially stopped to reduce injection flow, based on pre-established criteria that maintain core cooling, resulting in less outflow from the RWST. For smaller LOCAs, it is possible to cooldown and depressurize the RCS to cold shutdown conditions before the RWST is drained to the switchover level.

#### Additional Planned Activities

RG&E will work to support the Westinghouse Owners Group (WOG) evaluation of interim compensatory measures involving the potential impact of debris blockage of the containment sump. Interim compensatory measures (e.g., shutting down one train of ECCS and/or CSS, etc.), will require changes to the generic emergency response guidelines (ERGs) and emergency procedure guidelines (EPGs). Changes to these guidelines are evaluated by formal Owners Group specific maintenance programs. The process and schedule to change and issue revisions to the WOG ERGs and EPGs to address containment sump blockage issues is scheduled to be completed by March 31, 2004. After the generic Westinghouse guidance is approved and issued, RG&E will evaluate which changes (if any) are appropriate to Ginna Station's configuration. This activity is scheduled to be completed by October 31, 2004. After completion of the applicability evaluation, RG&E will provide the NRC Staff a detailed implementation schedule or inform the Staff if it has been determined that no additional changes are required.

### **3. Ensuring that alternative water sources are available to refill the RWST or to otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere**

#### Current Status

With respect to alternate sources to refill the RWST, guidance in procedure ECA-1.1 addresses RWST refill once it has been determined that loss of sump recirculation capability exists. It should be noted that RWST refill after initial depletion is not assumed in the safety analyses and plant design bases, and introduces the potential for containment flooding and the loss of instrumentation and equipment inside containment. With respect to alternate sources to inject into the RCS, procedure ECA-1.1 provides instruction to determine the sources and available flow paths for injecting into the RCS.

#### Additional Planned Activities

Any further modification to EOPs that could result in ensuring that alternative water sources are

available to refill the RWST, or to otherwise provide inventory to inject into the reactor core and spray into the containment atmosphere, will be evaluated and implemented via the Westinghouse Owners Group process and schedule described in #2 above.

#### **4. More aggressive containment cleaning and increased foreign material controls**

##### **Current Status**

Ginna Station has an aggressive program to maintain containment cleanliness and foreign material control. The results of the implementation of procedures IP-HSC-3, "House Keeping Control", ND-HSC, "Housekeeping and System Cleanliness and Foreign Material Exclusion" and A-3.1, "Containment Storage Inspection" have received an initial review to ensure the housekeeping standards and practices are effective in managing dust, dirt and debris in containment. The initial review process consisted of examining post outage video and photographic "tours" of containment areas, interviews with station ALARA personnel and interviews with personnel responsible for containment house keeping. The results of the initial review showed containment to be well maintained and free of debris that could easily be transported to the sump.

##### **Additional Planned Activities**

Further cleanliness assessments will be performed prior to startup from the next refueling outage (currently scheduled for October 2003). Additionally, although Ginna Station has previously implemented efforts to eliminate paper equipment tags, tie wraps that can not withstand the post LOCA environment, and other sources of debris, additional effort will be expended to quantify and if possible remove any of these items remaining. This activity also will be complete prior to startup from the next refueling outage (currently scheduled for October 2003).

#### **5. Ensuring containment drainage paths are unblocked**

##### **Current Status**

Procedure A-3.1 contains inspection provisions to ensure containment drainage paths to the sump are unblocked and no unrestrained items are placed such that they could block a drainage path. There are no subcompartment doors that interdict the drain paths.

##### **Additional Planned Activities**

None other than continued implementation of current procedure.

#### **6. Ensuring sump screens are free of adverse gaps and breaches**

##### **Current Status**

An initial evaluation of the sump screens was performed using photographs taken during the last

refueling outage. Those photographs showed no obvious gaps or breaches in the sump screen. Plant procedure A-3.1 requires evaluation of the sump screen during shutdown.

**Additional Planned Activities**

Because the sump screen photos do not provide conclusive evidence that no gaps or breaches exist, additional inspections will be performed to confirm that none exist. This activity will be completed prior to startup from the next refueling outage (currently scheduled for October 2003).



**Attachment 2**  
**Regulatory Commitments**

The following table identifies those actions committed to by Rochester Gas & Electric (RG&E) in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Mr. Brian Flynn, Manager, Primary / Reactor Systems at (585) 771-3734.

REGULATORY COMMITMENT	DUE DATE
Inspect containment sump screen to verify no bypass flow exists.	Prior to startup (i.e., Mode 4 entry) from the 2003 refueling outage (RFO), October 2003
Verify the effectiveness of containment housekeeping. This includes evaluation of containment for loose debris and dissolvable items such as paper equipment tags.	Prior to startup startup (i.e., Mode 4 entry) from the 2003 RFO, October 2003
Participate in WOG EOP activities involving sump clogging diagnostics and mitigative actions.	Target Completion Date (TCD) for WOG activities is March 31, 2004
Perform plant evaluation and submit schedule for implementation of necessary procedure changes to NRC.	October 31, 2004
Evaluate use of an at-power RHR NPSH calculation aid for enhanced sump fouling diagnostics.	December 31, 2003
If feasible, implement at-power RHR NPSH calculation aid, including procedure changes and operator training.	December 31, 2004