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LINVILLE,J.C. Region 1 (Post 820201)

SUBJECT: Responds to NRC 920326 ltr re violations noted in Insp Rept 50-244/92-201.Corrective actions:analyses based on values from preliminary hydraulic model rept & that may affect plant design will be re-examined & revised as necessary.

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May 4, 1992

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U.S. Nuclear Regulatory Commission
Region I
Attn: James C. Linville
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Division of Reactor Projects
475 Allendale Road
King of Prussia, PA 19406

Subject: Response to Notice of Violations
NRC Inspection Report 50-244/92-02 (1/19/92 - 3/9/92),
dated March 26, 1992
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Linville:

This letter is in response to your March 26, 1992 Inspection Report which transmitted three Notices of Violation from the SWSOPI 50-244/91-201 dated 1/30/92.

Statement of Violations

During the NRCs Service Water System Operational Performance Inspection (IR 50-244/91-201) conducted between December 2-20, 1991, three violations were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, (1991), the violations are listed below:

A. 10 CFR 50, Appendix B, Criterion III, "Design Control," requires in part, that design interface controls be established and that design control measures be provided for verifying or checking the adequacy of design.

Ginna Quality Assurance Manual, Section 3, "Configuration Control," Rev. 13, dated November 1, 1986, states in Section 3.4.3, "Design Verification," "The design verification shall assure that the design outputs (i.e., drawings, analysis and specifications) including design outputs from equipment suppliers, meet the design input requirements and are consistent and properly integrated." Section 3.4.4, "Interface Control," states that interface procedures between RG&E engineering and contractor engineering organizations shall include "instructions regarding the contents of document transmittals with consideration for response requirements. Transmittals of design documents shall identify the status of the documents and identify, where necessary, incomplete items

which require further evaluation, review, or approval."

Contrary to the above, the licensee was not properly controlling, verifying, and accepting design reports, calculations, or analyses. Specifically,

(1) The NUS Corporation calculation supporting Engineering Work Request (EWR) 1594, "Hydraulic Analysis of the Service Water System," dated February 1988, was submitted to the licensee marked "preliminary, for review and comment" in March 1988. As of December 1991, the analysis had not been reviewed and accepted by the licensee, but was being used for hydraulic analysis and balancing of the service water system (SWS) following installation of spent fuel pool heat exchanger B.

(2) Bechtel-KWU Report, "Heat Load Capacity/Design Margin Analysis for RHRHX, CCWHX, SFPHX, Non-Regenerative HX", Job No. 20031, Rev. 1, dated January 22, 1989, did not have any indication that it had been reviewed and accepted.

(3) Two copies of the RG&E design analysis for EWR 3689, "Containment Fan Cooler Air Flow," Rev. 0, dated June 4, 1984, were in existence. One contained handwritten notes and corrections, the other did not. The licensee stated that the correct design analysis was the one with handwritten additions even though they had not been reviewed and approved as part of a new revision.

(4) Rochester Gas and Electric Corporation (RG&E) design analysis document entitled "Insitu Motor Load Determinations" for EWR 4232, "SWS Pump Motor Studies," dated July 15, 1986, included incorrect assumptions based on a low slip motor and inappropriate equations. Consequently, the results were also incorrect. The incorrect assumptions had not been identified by the design verification process.

(5) RG&E design analysis for EWR 4658-ME-009, "Minimum Diesel Generator Cooler and Lube Oil Cooler Water Flow Requirements" Rev. 0, dated July 25, 1991, was prepared to justify DG operability with high differential pressure (dP) across the coolers due to zebra mussel tube plugging. The calculations did not use the applicable design conditions for cooling water inlet temperature and heat load. The incorrect design values resulted in incorrect assumptions and results.

This is a Severity Level IV violation. (Supplement II)

B. 10 CFR 50.34(b) states, in part, "The final safety report shall include information that describes the facility, presents the design bases and the limits on its operation, and

presents a safety analysis, of the structures, systems and components...and shall include...a description and analysis of the...components of the facility, with emphasis upon performance requirements, the bases, with technical justification therefore upon which such requirements have been established, and the evaluations required to show that safety functions will be accomplished. The description shall be sufficient to permit understanding of the system designs and their relationship to safety evaluations.

10 CFR Part 50.71(e) states, in part, "Each person licensed to operate a nuclear power reactor...shall update periodically, as provided in paragraphs (e) (3) and (4) of this section, the final safety analysis report (FSAR) originally submitted as part of the application for operating license, to assure that the information included in the FSAR contains the latest material developed...The updated FSAR shall be revised to include the effects of all changes made in the facility or procedures as described in the FSAR...revisions shall be filed no less frequently than annually and shall reflect all changes up to maximum of 6 months prior to the date of filing..."

Contrary to the above, a number of discrepancies existed in the Ginna Updated Final Safety Analysis Report discussion of the SWS.

(1) UFSAR Section 9.2.1.3 stated "....the service water loop is isolated by normally closed valves to provide two independent systems with no sizable cross-connections." The SWS has been cross connected by the 14" supply header for the containment air coolers since approximately March 1988. The system is also cross-connected at the three inch equipment cooler supply headers, at the three inch SI pump supply headers, and at the four inch component cooling water cross-connect in the supply header.

(2) UFSAR Section 9.2.1.3 stated "....All engineered safety features equipment is split between the two systems so that only half of the system would be affected by a malfunction." Due to the system cross connects, the equipment is not split between two systems. Also, if the system were operated split, the three safety injection pumps would all be on one header since they cannot be divided between headers.

(3) UFSAR Sections 9.2.1.2.1 and 9.2.1.2.2 stated that the service water system is designed to isolate non-safety-related loads on an accident and a safety injection signal, respectively. The SWS does not isolate non-safety-related loads on a safety injection signal (SIS) unless an undervoltage condition also exists.

(4) UFSAR Table 9.2-2 did not accurately reflect the total flow to the containment air coolers (CACs) because it neglected the flow to the CAC fan motor.

This is a Severity Level IV violation. (Supplement VII)

C. 10 CFR 50, Appendix B, Criterion III, "Design Control," requires that design control measures"...provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program."

10 CFR 50, Appendix B, Criterion XI, "Test Control," requires, in part, that test results be documented and evaluated to ensure satisfactory completion of test requirements.

Contrary to the above, the licensee had not reviewed the preoperational test results in comparison to current system operation and configuration and determined the need for additional testing to support operation in required system configurations. This had not been done despite system operating changes since initial licensing involving the number of pumps normally operating (changed from three to two) and various changes to the system valve alignment. Specific test deficiencies include:

(1) The non-safety-related loads were isolated from the loop headers when the safety-related performance of the system was tested (single pump operation). Current operation of the plant does not isolate the non-safety-related loads during an SIS.

(2) The safety-related performance of the system was not tested with two pumps operating. Two pumps are required to handle the post-accident heat load during recirculation.

(3) The system flow balance was established based on three pump operation, not based on the limiting case of one pump operating supplying all safety-related and non-safety-related loads.

(4) Pump run-out conditions were not evaluated or considered.

This is a Severity Level IV violation. (Supplement II)

Pursuant to 10 CFR 2.201 Rochester Gas and Electric hereby submits our response to the three violations above. This response augments the response provided in our letter dated April 6, 1992, Response to Inspection Report 91-201.

Response to Violation A

1. REASONS FOR THE VIOLATION

(1) NUS Corporation Calculation, "Hydraulic Analysis of Service Water System" existed in preliminary form since Feb. 1988. It was generated to assist the Engineering Department in determining that the installation of a new spent fuel pool heat exchanger (EWR 1594) could be placed in parallel with the existing one without adversely affecting the service water system during its normal operation. (There are no accident conditions for which the spent fuel pool heat exchangers are required). The results listed in the report were utilized in our analysis supporting the opening of the containment fan cooler cross-tie line, and in an NUS analysis supporting replacement of the discharge service water valves to the component cooling water heat exchangers during the 1991 refueling outage. The computer model was also used in several scoping studies performed by RG&E that did not necessitate formal design analyses and which were not used as a basis for any plant changes. The service water hydraulic model and its report has not received widespread use. It did receive the necessary reviews by the consultant, NUS Corp., under their Appendix B program, with the exception that the cover sheet sign-off was withheld pending RG&E formal acceptance of the report. The report was reviewed by RG&E and accepted for use, however, the report was not formally finalized. There is no adverse affect on plant safety as a result of the failure to have previously formally approved the report.

(2) The Bechtel-KWU Report, "Heat Load Capacity/Design Analysis for RHRHX, CCWHX, Non-Regenerative HX" did not contain a formal indication of RG&E acceptance of the report. The results of this report were applied as a basis to establish tube plugging criteria for the CCW heat exchangers. The number of tubes plugged to date is small as compared to the criteria established in the Bechtel-KWU report. Plant personnel had contracted with Bechtel-KWU to prepare the report utilizing a detailed purchase specification. The report was prepared, reviewed, and approved by the consultant under their Appendix B program. For these reasons there is no impact on plant safety as a result of RG&Es lack of formal sign-off.

The reason for the violation examples in (1) and (2) was the lack of specific procedural direction to assure that the review of vendor or consultant design documents are conducted and documented.

(3) RG&E design analysis, "Insitu Motor Load Determinations", did contain inappropriate assumptions, however, the EWR was a "study only" analysis of an existing design and did not result in design outputs. Since the analysis was not used in producing a design output it was not subject to a design

verification process. The study was used to initiate a work request to evaluate the sizing of the service water pump motors (EWR 5051). Tests performed in Nov. 1991 and Feb. 1992 established the service water motor requirements and concluded the existing motors are adequately sized. The analysis also initiated an examination of service water motor heatup characteristics (EWR 4878) which were consequently found acceptable. The NRC review during the SWSOPI concluded RG&E was addressing these issues appropriately. The study analysis received a low priority to be corrected because of the follow on work initiated to resolve concerns. Revision of the study analysis was considered to have little safety significance because of the later work.

(4) The RG&E design analysis, "Containment Fan Cooler Air Flow", performed under EWR 3689 did contain hand written and initialed corrections, whereas, another copy provided to the inspection team did not. This marked up version was a working copy used by the Responsible Engineer. The original design analysis in the EWR Package in the Document Control area has been found to be a clean copy with no corrections. The design analysis was prepared based upon information and results obtained from the NSSS supplier pertaining to fan cooler performance. The working copy of the design analysis was hand corrected, because the air flow curve had been misread when the design analysis was initially prepared. The correction made to adjust for the misread curve was appropriate to make and was used in generating the analysis results. We agree, as a minimum, that these corrections should have been properly annotated on the original or revised, and redistributed.

(5) RG&E design analysis, "Minimum Diesel Generator Jacket Cooler and Lube Oil Cooler Service Water Flow Requirements", EWR 4658ME-009 Rev. 0 did utilize a temperature value of 75 degrees F. for service water inlet temperature to the coolers because that value had been listed in the Gilbert and Associates (A/E) Bill of Material for the coolers. The cooler performance requirements were calculated in the design analysis. During the SWSOPI, a data sheet prepared by the manufacturer of the coolers, American Standard, was located in Ginna Station records by the inspection team. That data sheet included an inlet service water temperature value of 80 degrees F. The American Standard data sheet was not available when the design analysis was prepared. Therefore, the analysis did not err in its identification of the source of the input temperature since it was supported by the Gilbert Bill of Material. RG&E agrees that the American Standard value is the appropriate value and corresponds to that cited in the UFSAR. However, use of 75 degrees makes the results conservative. Since the heat load required was a given input value, the use of 75 degrees resulted in a larger value of required cooler efficiency to remove the given heat load. This resulted in the analysis calculating a higher minimum SW flow value than

would have been obtained if 80°F had been used. Therefore, the results were conservative.

The reason for violation examples (3) and (4) was lack of attention to detail regarding formal revision process for RG&E-generated design analyses. Violation example (5) was performed with the best information available at that time, and was conservative. We do not consider it should have been an example for this violation.

2. CORRECTIVE STEPS TAKEN AND RESULTS ACHIEVED

The NUS hydraulic analysis report discussed in item (1) above has been re-reviewed by RG&E and a list of comments generated and sent to NUS. The comments will be incorporated and the report formally approved by RG&E by September 1992.

The Bechtel-KWU report discussed in (2) above is being given an independent review by another design consultant to RG&E. After their review, RG&E will document its final approval. It is scheduled to be completed by July 1992.

Based on the analysis for EWR 4232 discussed in (3) above, RG&E initiated two related design work studies/analyses under EWR 5051, service water pump motor sizing evaluation, and EWR 4878, service water pump motor cooling. Tests were completed in Feb. 1992 concluded the motors are adequately sized and the load requirements would not cause the motors to overheat. RG&E is preparing documentation for EWR 4232 to supersede the "Insitu Motor Load Determinations" analysis. Since the EWR 4232 analysis will be superseded, it is not necessary to revise it. We will, however, note in the file that it is superseded.

The analysis for "Containment Air Cooler Air Flow" discussed in (4) above has been revised and the analysis "Minimum Diesel Generator Cooler and Lube Oil Cooler Water Flow Requirements" discussed in (5) above has been scheduled to be revised by 6/1/92.

3. CORRECTIVE STEPS TO BE TAKEN TO AVOID FURTHER VIOLATIONS

Any analyses performed by RG&E, or that are in process, which are based upon values from the preliminary hydraulic model report and that potentially could affect plant design will be re-examined and revised as necessary to cite and reference the RG&E approved report.

As noted in our response to the SWSOPI inspection report 91-201 (April 6, 1992), changes to the appropriate engineering procedures were implemented. QE-314, "Review and Approval of A-E or Consultant Design Documents", and QE-704, "Review and Approval of Vendor Design and Manufacturing Technical Documents" were revised to include additional requirements for providing appropriate approval of these documents.

In June 1991 the Nuclear Engineering Services (NES) Department initiated the Process Upgrade Program to improve the effectiveness and efficiency of the engineering and technical services provided by the Department. This Program was established following our completion of several internally and externally conducted engineering process assessments. Major improvement opportunities have been defined by ten Focus Areas, each with a specific objective that must be accomplished to meet the overall Program goal. The objective of one of these focus areas, Document Control, is to enhance the document control process to ensure that appropriate documents are controlled and that they are retrievable, accessible, current, and relevant. One of the tasks within this focus area is to enhance the control methodologies for vendor generated documents. This task will review the existing engineering procedures covering review and approval of vendor design documents and prepare recommendations for their acceptance, control, issuance, distribution, revision, retrieval, storage, and status based upon the input from the focus group and the previous assessments. While the completion of this task is not required to achieve regulatory compliance for the deficiencies identified for this violation, it is designed to develop a more integrated and enhanced document control process which will include control of consultant and vendor documents.

RG&E has previously completed hydraulic computer modeling for the Emergency Core Cooling System (ECCS), Auxiliary Feedwater System, and Component Cooling Water System (CCW). Reports covering these hydraulic models were completed between March and July 1991 and prepared by the same design consultant, NUS Corp., as the service water system. These reports have been reviewed in detail by RG&E, and our comments have been incorporated. Although these projects were previously completed, these reports will also be reviewed and documented as approved for use.

4. DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

The two engineering procedures discussed in Part 3. above have already been revised. Full compliance will be achieved following revision of the analyses discussed above. The longest lead time item is the NUS service water system hydraulic model. We anticipate this can be completed and approved by 9/30/92 and allow sufficient time to complete other design analyses on the service water system that we are committed to complete prior to the 1993 refueling outage.

Response to Violation B

1. REASONS FOR THE VIOLATION

RG&E agrees that discrepancies existed between the UFSAR and the plant configuration as identified by the specific items (1) through (4) of Violation B. Discrepancies (1) and (2)

were the result of an incomplete description of the SWS cross-tied design configuration. Discrepancy (3) was the result of an incomplete description of the isolation signal for non-safety SW loads. Discrepancy (4) was the result of an inconsistency between the intended use of the flow values tabulated in Table 9.2-2 and the misleading column headings in the table.

The text description of the SWS, which has not undergone substantive changes since the licensing of Ginna, contains information from relatively few sources. Its level of detail is consistent with the original FSAR. There have been few modifications to the service water system. In addition, the level of detail in the NRC SER provided on the SWS under SEP Topic IX-3 dated Nov. 3, 1981, contained a comparable level of detail. This SER was one of the primary sources used to update the FSAR in Dec. 1984 in accordance with 10 CFR 50.71(e).

The updated FSAR (UFSAR) is a combination of the original FSAR as well as a summary of pertinent information docketed by RG&E and NRC, a summary of safety evaluations supporting plant changes, and a description of new structures, systems and components incorporated into the plant. Information may involve systems and components that are safety-related, non-safety-related, and those that involve commitments to other standards or requirements, such as 10 CFR 50 Appendix R. Consequently, the UFSAR combines descriptions of the original plant requirements as well as a summary description of changes that have been supported by other evaluations, safety analyses or docketed correspondence.

The UFSAR, by itself, is not considered to represent the entire licensing basis for Ginna. The licensing basis consists of the information from the original FSAR, docketed correspondence, and analyses in support of plant changes made under the provisions of 10 CFR 50.59. The UFSAR provides a summary of this information.

RG&E has also maintained a traceable record of the sources of all information and changes used for each section within the UFSAR. All sources used to update the original FSAR to the UFSAR (Dec. 1984) have been maintained and are traceable to the particular section(s) within which each was utilized. A conscious effort has been made toward achieving a consistent level of detail and accuracy within the UFSAR, for example, in not incorporating copious amounts of text involving changes that have minor safety significance. The UFSAR is not formatted as a set of the requirements under which the plant was licensed, and its use cannot be separated from the source documents used to update it.

Discrepancy (1) identified a statement in section 9.2.1.3 that

stated that "the service water loop is isolated by normally closed valves to provide two independent systems with no sizeable cross-connections." It was identified during the 91-201 inspection that the 14" cross-connect branch line leading to the 4 containment air coolers (CACs) contained two isolation valves that were open. The UFSAR text above originated from the FSAR and had not been changed. The UFSAR description in this section focused on the service water supply headers, two 20" lines leading from the 4 service water pumps to the various SW heat exchangers and loads. The level of detail in the text did not include a description of branch lines.

Even though analysis has shown that no adverse impact results from having the 14" branch line open, we recognize that the UFSAR should have contained a better description in that section.

The CAC cross-tie line was opened on March 3, 1988 after RG&E had evaluated the benefits of opening the cross-tie and found that it produced better balancing of the flow distribution. (See Action Item 4 of attachment 2 to RG&Es response to 91-201 dated 4/6/92). The plant configuration change was represented on the P&IDs, valve position procedures, and documented in the PORC minutes. However, since no procedures existed at that time which would have triggered an UFSAR change to be processed, section 9.2.1.3 was not revised to include the additional level of detail.

The position of the CAC cross-connect valve 4639 was changed from closed to open as documented by a procedure change notice (PCN). It was not initiated by a plant modification process, Engineering Work Request (EWR) or Technical Staff Request (TSR). At the time of that change (3/3/88) the current 10 CFR 50.59 screening process for PCNs (A-601.8 procedure) had not yet been implemented. That process contains screening questions designed to identify those changes that would impact the UFSAR. This process was implemented in September 1988. The lack of this process in March 1988 contributed to this discrepancy identified by the inspection team.

Discrepancy (2) involved a statement in UFSAR section 9.2.1.3 that "all engineered safety features equipment is split between the two systems so that only half of the system would be affected by a malfunction." The system design and configuration of the branch lines providing flow to the engineered safety features equipment had not changed from the original plant design. This is evident from original plant drawings. The UFSAR text originated from the FSAR and had not been changed. The system design provides for operation of the engineered safety features (ESF) equipment from either SW loop header with their branch cross-connecting lines open. From a system reliability standpoint, a malfunction resulting in leakage from one of the SW lines could be isolated. Flow to

the ESF equipment would then be provided by the intact loop. (Pipe breaks in moderate energy lines like service water concurrent with a Design Basis Accident were not required to be evaluated in the licensing of Ginna. Pipe breaks were evaluated for flooding concerns.) RG&E agrees that, based on the inspection teams concern, additional detail would be needed to clarify the ESF configuration. However, the configuration has not changed and is adequately designed to supply these loads. Actually, additional safety is provided by virtue of having these branch lines cross-connected for the more probable active failures.

Discrepancy (3) involved an incomplete description in section 9.2.1.2.2 of the safeguards signal used to isolate the non-safety-related SW loads. The term safety injection signal was used loosely in this section and should have been written safety injection signal concurrent with an undervoltage condition. The discussion in section 9.2.1.2.2 focused on redundant service water trains. Section 9.2.1.2.3 discussed accident conditions and did include detail involving the undervoltage condition. The discrepancy identified in 9.2.1.2.2 was the result of the implicit assumption that an undervoltage condition would also exist. This is the case, because the limiting accident discussed in the service water sections of the UFSAR is the large break LOCA combined with a loss of offsite power. Under these accident assumptions an SI signal would be accompanied by an undervoltage condition. The term safety injection signal should not have been used synonymously with safety injection signal concurrent with undervoltage.

Discrepancy (4) involved SWS flow values in Table 9.2-2. The flow to the containment cooling coils was listed as 4248 gpm during the first hour after a Design-Basis Accident. The discrepancy stated that the table did not accurately reflect the flow to the containment air coolers (CACs), because it neglected the flow to the CAC fan motors. RG&E agrees that the column headings in the table and the text reference to the table did not clearly identify the intended use of the flow values. The values were represented on the table to show that SW pump capacity was adequate under the accident condition considered, i.e., large break LOCA with loss of offsite power and the assumed failure of one emergency diesel generator. The flow values are nominal, and were not intended to be minimum or maximum values to be utilized as the basis for determining adequate flow to the individual components on the table. This was not clear from the UFSAR text. The lack of explanation of the intended use of the flow values in the table was the cause of the discrepancy.

The containment cooling coil SW load listed in the table should have been listed as the CAC unit, since the total SW flow is the appropriate value not the net flow to the CAC

cooling coils only. We agree that the flow to the CAC cooling coils would, therefore, be reduced by the amount of SW flow bypassed to the fan motor cooling coil. (There are 3 CAC cooling coils and 1 fan motor cooling coil in each unit). The total SW flow demand, however, has not changed. The safety impact of the reduction in flow to the CAC cooling coils is being analyzed as a separate item and is discussed in our response to Observation 91-201-06 in our letter dated 4/6/92.

2. CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED

The specific action taken regarding Discrepancy (1) was to include a description of the branch cross-tie positions in the UFSAR Section 9.2.1.3 and to clarify that the 20" supply loop is isolated by valves 4610 and 4779 to provide two flow paths to the safety-related component cooling water heat exchangers and spent fuel pool heat exchangers. These changes were included in our submittal of the UFSAR Dec. 16, 1991.

Regarding Discrepancy (2), section 9.2.1.3 was also modified in our Dec. 16, 1991 update in the second paragraph to state that, "All engineered safety features equipment is capable of being split [underlined words added] between the two systems so that only half of the system would be affected by a malfunction." We believe that additional detail should also be included to better explain the configuration of the service water lines leading to the engineered safety features equipment. This will be prepared and submitted in the Dec. 1992 update.

Regarding Discrepancy (3), section 9.2.1.2.2 was revised and submitted in our Dec. 16, 1991 update to clarify that non-safety loads are isolated on a safety injection signal concurrent with an undervoltage condition. Section 9.2.1.2.1 (first paragraph) will also be enhanced to clarify the meaning of the words "following an accident." This latter item will be completed and submitted in our Dec. 1992 update.

Regarding Discrepancy (4), Table 9.2-2 was revised and submitted in our Dec. 16, 1991 update. The words "containment cooling coils" were modified to "containment fan cooler unit cooling coils" to clarify that the flow value represents the total flow. The column headings were modified to specify that the flow values are Nominal and were also separated to represent flow during the injection phase and during the recirculation phase as opposed to flow during the first hour and after the first hour following a Design Basis accident. Footnotes (a) and (b) were added to the table and a new paragraph was included in section 9.2.1.2.1 as further explanation of the CAC flows. We will modify Table 9.2-2, as appropriate, to include the nominal flow to the CAC fan motor coils and to include changes that may result from our analysis demonstrating that only one service water pump is required

during the recirculation phase. (Refer to our response to Deficiency 91-201-06 in our letter dated 4/6/92). Other changes, emanating from the 1981 SER on SEP Topic IX-3, will be made following NRC response to our proposed changes to that SER submitted in a letter dated April 9, 1992.

In addition to the specific steps described above, improvements have been made to the UFSAR change process and the 10 CFR 50.59 process supporting it.

All proposed changes to the UFSAR are given the necessary interdisciplinary reviews and reviews by personnel within the Technical Engineering, Operations, and Modification Supports groups.

In September 1988 the 10 CFR 50.59 process associated with the Procedure Change Notice (PCN) procedure A-601.8 was implemented. This process involved screening questions that must be answered for all changes to procedures. One of those screening questions involves changes to procedures described in the UFSAR and another involves changes to configuration. The purpose of the screening questions is to identify those changes requiring a written safety evaluation.

RG&E has developed and implemented procedure QE-334, "Preparation, Review and Approval of Changes to the UFSAR." This procedure contains the criteria and overall requirements that must be followed in preparing UFSAR changes. The process includes preparing UFSAR changes that result from plant modifications, as well as changes that are deemed necessary when an UFSAR statement is found to be untrue or in need of clarification. The process incorporates 10 CFR 50.59 requirements. This procedure, approved Nov. 1991, currently is implemented for Nuclear Engineering Services (NES) only. A parallel procedure applicable to activities within Ginna Station is currently under review.

The requirements of QE-334 were reiterated to all NES Responsible Engineers in a directive issued March 30, 1991, citing RG&Es objective of providing clear and accurate UFSAR information.

3. CORRECTIVE STEPS TO BE TAKEN TO PREVENT FURTHER VIOLATIONS

To further improve the PCN process, substantive revisions to the procedure A-601.8 have been drafted and have undergone reviews.

These revisions involve a reformatting of the screening questions into categories and instituting a standard format for written safety evaluations. We believe that these proposed revisions will enhance our ability to identify procedure changes that necessitate an UFSAR change. In the

interim, prior to implementation of those procedure changes, the current procedure will be updated to include a check step for UFSAR impact. This will be implemented by June 1, 1992.

The Ginna Station procedure for preparing UFSAR changes (A-65) which parallels NES procedure QE-334, has received interdiscipline and management reviews and comments were generated at an April 16, 1992 review meeting. This procedure is expected to be implemented by August 31, 1992, allowing sufficient time prior to the next annual UFSAR update. In the interim, a directive has been issued to Ginna Station Responsible Managers to increase the awareness of their responsibility to bring unclear, inaccurate or misleading information found in the UFSAR to the attention of appropriate personnel so that changes are adequately controlled and documented.

Other procedures that interface with QE-334 and A-65 will also be revised as necessary. Proposed changes to some of these had been drafted prior to the NRC SWSOPI:

QE-1501, "Engineering Review of Nonconforming Material, Parts and Components"
A-304, "Preparation, Review and Approval and Distribution of Design Output and Design Review Documents for Minor Modifications"
A-1502, "Nonconformance Reports"

Three procedures have already been revised:

QE-310, "Design Interface Control"
QE-301, "Preparation, Review and Approval of Design Input Documents"
A-305, "Technical Staff Engineering Evaluation"

These procedure revisions provide the necessary tie-in to QE-334 and A-65 such that changes to plant configuration brought about by the use of those procedures listed above will trigger the UFSAR change process.

4. DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

Changes within the UFSAR in Section 9.2.1, Service Water System, will be made as the result of the deficiencies identified. Date of full compliance will be coincident with the next annual UFSAR update, Dec. 16, 1992.

RESPONSE TO VIOLATION C

1. BASIS FOR DISPUTING VIOLATION

The violation stated that RG&E "had not reviewed the preoperational test results in comparison to current system operation and configuration and determined the need for additional testing to

support operation in required system configurations." RG&E does not accept this violation based on the fact that results of the preoperational testing had been reviewed at the time of the testing, did meet the objectives of the testing, and that the identified changes made to system configurations do not invalidate that testing. The results of the testing were reviewed and accepted by the NRC prior to the licensing of Ginna.

The purpose of the testing was to establish that the service water system would satisfy the specified cooling requirements during normal and accident conditions. The pump with the lowest capacity was required to meet the flow requirements for safeguards operation. The test was to verify that three(3) service water pumps would supply the required cooling water capacity to all normal flow components.

The preoperational test results from completed procedure RGE-SU-4.17 dated 11/1/68 were reexamined by RG&E following the SWSOPI and the results of this review were provided in our response to Inspection Report 91-201-14 in Action Item 5) of Enclosure (2) of our letter dated April 6,1992. This re-review concluded that the test objectives were met.

The testing was set up to simulate service water operation following the worst case postulated accident conditions. It was not the objective to demonstrate operational requirements under all postulated operating conditions because the tested configuration is bounding. It was identified by the inspection team that system operation was changed from three pumps to two since the initial licensing of Ginna with no determination of the need to perform additional testing. Our review concluded that the three pump preoperational test providing flow to safety-related as well as non-safety-related loads envelopes two pump operation providing flow only to the safeguards loads. In addition, the SWS was not specifically designed to require three pumps at all times. Flexibility in the design provided for either two or three pump normal operation. There is no requirement to operate with three pumps stated in the original FSAR and the Updated FSAR stated that the plant load requirements dictate either two or three pumps for normal full load (9.2.1.2.1). The three pump configuration was performed during the test and met the test objective. Operation with two pumps is not considered to be a change to system configuration. This is discussed under <u>Demonstration of Two Pump Operation</u> in this section.

The test procedure required that the service water pump with the lowest capacity, i.e the lowest head-capacity curve, be used to demonstrate minimum flow requirements for safeguard operation. The one pump test was run with pump D in operation to simulate the accident condition. Pumps B,C, and D were operated during the test phase to demonstrate adequate flow for normal operation with flow being provided to all normal plant service water loads. These were the three lowest capacity pumps. Therefore, this test requirement

was satisfied. Satisfying service water requirements during normal plant modes has been demonstrated over the last 20 years of plant operation. This long term operation is clearly a better test of system adequacy to support normal plant operation than a preoperational test could demonstrate.

Based on our re-review of the preoperational test results, we agree that the quality of the procedure and test results reflected the less rigorous standards in effect at the time, however, we do not agree that the test results were not evaluated and determined to meet the test objectives.

The current SWS configuration with the cross-tied design has been adequately justified by the design reviews and analyses performed prior to and during the SWSOPI inspection. These reviews do not invalidate the preoperational testing and do not suggest a requirement to perform additional testing to confirm these results. Whereas the cross-tie to the safety-related diesel generator coolers was closed during the preoperational test, RG&E has demonstrated through analysis that the effect of opening this cross-tie is not significant. This is due mainly to the relatively small size of this line (4" dia.) as compared to the containment air cooler(CAC) cross-tie (14" dia). RG&E committed to formalize this analysis under Action Item 4) of Enclosure (2) of our April 6, 1992 response to IR 91-201.

The test deficiencies identified in the inspection report 91-201-14 and repeated in Violation C are discussed below with the reasons we do not believe this violation is justified.

System Operating Changes Affecting Test Results

The 14" CAC cross-tie valves (4639 and 4756) were confirmed to be open for both the pre-op testing and the current configuration. The discharge valves for coolers supplied during the injection phase post accident (diesel generators; turbine and motor driven auxiliary feedwater pumps; area air coolers for charging pumps, RHR pumps, safety injection pumps/containment spray pumps; safety injection pumps bearing cooling; penetration cooling; reactor compartment cooling; and containment air coolers) were confirmed to be open during pre-op testing and current operation. The discharge valves on these loads were not throttled during the pre-op tests. The CAC flows were also verified with installed flow indicators.

The diesel generator cross-tie valve 4669 was closed during the pre-op test. The cross-tie line is open in the current configuration. However, both analyses using the RG&E model of the service water system, and tests of the system with different valve alignments, demonstrate that this cross-tie is inconsequential to the performance of the service water system. Specifically, the CAC cross-tie provides sufficient header communication that flow to the diesel generators equalizes whether or not the cross-tie is open or closed.

The number of pumps normally operating in the service water system is unchanged from the pre-op tests. The SWSOPI inspection team was concerned that often the service water system is operated with only two pumps whereas the pre-op tests demonstrated system operation with three pumps. Our review of the pre-op test indicates the three pump operation included design basis flow of 5050 gpm to the CCW heat exchanger. Typically, the heat removal demand of the CCW system is far less than design and service water flow to the CCW heat exchanger is throttled heavily. Moreover, design flows demonstrated by the pre-op tests simulated high lake water temperature conditions of 80 degrees F. Most of the year lake temperatures are considerably lower and the heat removal capability per unit volume of service water is much higher. For these reasons the service water system is often capable of being operated with two service water pumps. However, the operating philosophy and design of the system has not changed from that demonstrated by the pre-op tests.

Isolation Of Non-Safety Loads

The SWSOPI inspection team indicated concern regarding the alignment for the pre-operational test with non-safety related portions of the Service Water System isolated when demonstrating Service Water System operation under safeguards conditions. Specifically, the pre-operational test aligned the system for a postulated safeguards actuation signal simultaneous with a loss-of-offsite power and failure of a single Diesel-Generator. The SWSOPI inspection team was concerned that the pre-operational test did not also consider operation under safeguards conditions with offsite power available and the failure of a single service water pump. This set of assumptions could potentially result in a single operating service water pump and no automatic isolation of non-safety related Service water demands. (Assumes two other Service Water pumps are inoperable as permitted by current Technical Specification)

RG&E's assessment of this concern indicates no potential to affect operability or safety of the plant or service water system. During initial safeguards conditions, service water is supplied to the diesel generator coolers, the containment air coolers (CACs), and several miscellaneous equipment and area coolers. None of these components are essential for plant initial response to safeguards conditions should offsite power be available. Offsite power obviates the need for the diesel-generators, and containment spray pumps are adequate alone to control containment pressure without heat removal by the CACs. Analyses have demonstrated the ability of the miscellaneous equipment to perform without service water cooling. Moreover, analyses using the RG&E hydraulic model of the service water system indicate that, in the alignment of safeguards condition with offsite power available, a single service water pump is capable of supplying adequate flow to provide design cooling to the Diesel Generators and adequate cooling to the other coolers; albeit less than would be provided if the non-safety service water

demands were isolated. (This analysis used the current unthrottled flow balance to the D/G coolers).

RG&E notes that it was not the philosophy nor the intent of the original pre-op tests to demonstrate service water system operation under all conceivable operating conditions; only under those conditions which were understood at that time to represent the design basis demand on the system in terms of overall plant response. A postulated safeguards condition with loss of offsite power and failure of a diesel-generator was considered then, as today, to be the true worst-case challenge to the plant and its service water system. Other configurations are less limiting.

Demonstration Of Two Pump Operation

The SWSOPI inspection team was concerned that the pre-operational tests did not test the service water system in the postulated recirculation phase of an accident, i.e. with two pumps supplying flow to the initial safeguards demands, discussed above, plus the component cooling water heat exchanger.

RG&E has assessed this concern and believes there is no affect on system or plant operability. Specifically the case of two pump operation is bounded by the test conditions and results of the second and third phases of the pre-op test. (Test requirements 2.2 and 2.3 of procedure SU-4.17). In the second phase of the pre-op test, a single service water pump was demonstrated to supply the safety injection phase demands of the service water system; demands measured to be about 5550 gpm during the test. In the third phase of pre-op testing, the three lowest capacity service water pumps were aligned to supply the demand of the entire system; safety-related and non safety-related. This included design flows to all coolers which are required for the recirculation phase of a postulated accident, including the design flow of 5000 gpm to the CCW Heat Exchanger. Service water discharge pressure was recorded to be about 80 psig indicating that all pumps were pumping less than their design flow of 5300 gpm, which would be equivalent to 65-70 psig. Since recirculation phase service water demand to the CCW heat exchangers is presently controlled in emergency procedures to be 5000-6000 gpm greater than safety injection phase demand, or about 10550 gpm (5550+5000) based on the pre-op tests, the third phase of the pre-op tests demonstrates implicitly that the service water system is capable of meeting the requirements for two pump operation for the recirculation phase of a postulated accident.

Flow Balancing Based On Three Pump Operation

The SWSOPI inspection team indicated concern that the pre-op tests balanced service water flows with three service water pumps operating instead of one. The SWSOPI team apparently believed one pump operation to be the limiting case.

RG&E has assessed the flow balancing methodology of the pre-op

tests and concludes that there is no affect on system operability. The pre-op tests balanced the service water flows based on the original design of the service water system, i.e. under design operating conditions. Cooler dPs were matched to the expected design dP to infer that actual flows were matched to design flows. Service water coolers required to respond to initial safeguards conditions were balanced under one pump operating conditions. Non-safety related flows were balanced under three pump operating conditions. CCW flows for recirculation phase are controlled by procedure and did not need to be balanced as part of the tests.

As discussed above, the pre-op tests were not intended to demonstrate service water system operation under all postulated single failure conditions, only those considered worst-case for plant performance under safeguards conditions. Hence, the pre-op tests optimized service water flow for the design basis conditions of the system. The tests did not intend to balance flow for other service water system alignments which, although appearing "more limiting" for the Service Water System, are actually less severe conditions from a plant overall response to a postulated accident. (Refer to Action Item 6 of Attachment (2) to our response to Inspection Report 91-201 dated April 6, 1992.)

Pump Runout

The SWSOPI inspection team indicated concern that the pre-op tests did not evaluate or consider pump runout.

RG&E has assessed this concern and concludes that there should not be a concern from the pre-op results. As discussed above, the pre-op tests were intended to demonstrate the operation of the service water system under design conditions. The pre-op tests operated the pumps at about 120% of design flow but not at full runout (approx. 140% of design flow). Postulated conditions which would cause the service water pumps to runout further than demonstrated by the pre-op tests are not, as discussed above, limiting from the plant's overall performance under safeguards conditions. Subsequent testing by RG&E has demonstrated service water pump capability at flows approaching runout (7400 gpm) and vendor information confirms that the pumps are capable of operating at runout flows.

2. CORRECTIVE STEPS THAT HAVE BEEN TAKEN AND RESULTS ACHIEVED

The preoperational test discussion is related to SWSOPI Unresolved Item 91-201-02, Reassessment of SWS Hydraulic Model. RG&E responded to those concerns in Attachment 2, Action Item 1) of our response letter dated April 6, 1992. Based upon our review of the service water hydraulic model and the preoperational test results, a working plan was developed for use by the Nuclear Engineering Department to enhance the hydraulic model concurrently with

determining the optimal flow balance in the service water system. RG&E provided a response to the NRC dated January 31, 1992 regarding actions planned for the 1992 outage, during the course of 1992, and during the 1993 outage. These actions involved evaluating the performance of the diesel generator service water coolers, reviewing and enhancing the service water system hydraulic model, and conducting testing during the 1993 refueling outage to confirm the analytical results of the enhanced service water hydraulic model and optimal system balance. The 1992 refueling outage is currently in progress. RG&E will notify the NRC of the results of service water system balancing activities conducted during this outage following our review of those results.

Testing performed in conjunction with procedure PT-2.7 in Nov. 1991 and Feb. 1992 determined that the head-capacity performance of the 4 service water pumps reasonably matches that determined during preoperational tests.

3. CORRECTIVE STEPS TO BE TAKEN TO PREVENT FURTHER VIOLATIONS

No further actions are planned related to the preoperational test concerns.

4. DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

RG&E is in full compliance with the requirements regarding preoperational testing. Performance testing detailed in our SWSROP document will demonstrate the continued capability of the system in the future.

Very truly yours,

Robert E. Smith

GAH/224

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