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SUBJECT: Forwards corrections to NRC 811104 SER re SEP Topic IX-3, "Svc Water & Cooling Water Sys," per Svc Water Sys Operational Performance Insp 50-244/91-201.More detailed calculations re post-accident heat loads underway.

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April 9, 1992

U.S. Nuclear Regulatory Commission
Document Control Desk
Attn: Allen R. Johnson
Project Directorate I-3
Washington, D.C. 20555

Subject: SEP Topic IX-3, Service Water and Cooling Water Systems
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Ref. (a) NRC letter, dated November 3, 1981, from Dennis M. Cruthfield (NRC) to John Maier (RG&E), "SEP TOPIC IX-3, STATION SERVICE AND COOLING WATER SYSTEMS, GINNA"

Dear Mr. Johnson:

As a result of discussions with NRC representatives during the Service Water System Operational Performance Inspection (NRC Inspection No. 50-244/91-201) at Ginna Station, RG&E agreed to advise your office of the need to clarify several items contained in the referenced SER. A number of recommended changes, written from the perspective of a reviewer preparing the original SER, are suggested in Attachment A to this letter.

No changes are recommended to the NRC comments regarding the apparent inconsistency between what Service Water System arrangements are needed for long-term recirculation cooling, and what is required to be operable in the Ginna Technical Specifications. As stated in Reference (a) above, ..."this evaluation will be a basic input to the integrated safety assessment for your facility..." RG&E's understanding was that proposed facility changes would be reviewed within the context of this overall Integrated Safety Assessment, not necessarily as a result of each individual topic assessment (see NUREG-0821, Dec. 1983). The Integrated Safety Assessment requested only that RG&E evaluate the power supply/pump arrangement, where potentially both operable Service Water (SW) pumps would be aligned to the same power supply. This issue was resolved, as part of the NRC-approved License Amendment No. 11, July 30, 1985.

RG&E is presently in the process of performing more detailed analyses relative to post-accident recirculation heat loads. Preliminary results indicate acceptable conditions prevailing within containment and the CCW/RHR systems, using only one SW



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pump for both the post-LOCA injection and recirculation phases. It is expected that this analysis can be completed, and an independent review performed, by the end of June 1992. We will keep you advised of the schedule for this item and provide the results when completed.

Very truly yours,

Robert C. Mecredy

Robert C. Mecredy

JCM/212

xc: Mr. Allen R. Johnson (Mail Stop 14D1)
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Washington, D.C. 20555

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Ginna Senior Resident Inspector

ATTACHMENT A

R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.1: (see page 3 of SER, section V.1. Component Cooling Water System, last paragraph)

Existing Wording:

During normal plant operation, one CCW pump and one CCW heat exchanger are in operation, and they can accommodate the heat removal load on the system. Both pumps and heat exchangers are normally used for a plant cooldown; however, if one pump or one heat exchanger is not operable, safe operation of the plant is not affected, but the time to cool the plant is extended (Reference 2). CCW pump A and B receive electrical power from 480 V buses 14 and 16, respectively.

Recommended Wording: (proposed changes are underlined)

During normal plant operation, one CCW pump and at least one CCW heat exchanger are in operation, and they can accommodate the heat removal load on the system. Both CCW pumps and both CCW heat exchangers are normally used for a plant cooldown; however, if one pump or one heat exchanger is not operable, safe operation of the plant is not affected, but the time to cool the plant is extended (Reference 2). CCW pumps A and B receive electrical power from 480 V buses 14 and 16, respectively.

ATTACHMENT A

R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.2: (see page 5 of SER, section V.1. Component Cooling Water System, third paragraph)

Existing Wording:

No post-accident realignment of the CCW system is performed by the operator except for the opening of a CCW supply valve to one RHR heat exchanger at the start of recirculation and closing, or verifying the automatic closure of, the isolation valves to the service inside containment. These actions can be performed from the control room.

Recommended Wording: (proposed changes are underlined)

No immediate post-accident realignment of the CCW system is performed by the operator except for closing, or verifying the automatic closure of, the containment isolation valves in the CCW lines serving the reactor support cooling pads, the excess letdown heat exchanger and, if necessary, the Reactor Coolant Pumps. At the start of recirculation, post-accident realignment of the CCW system by the operator consists of starting the second CCW pump and opening the CCW supply valves to both RHR heat exchangers. These actions can be performed from the control room.

ATTACHMENT A

R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.3: (see page 6 of SER, section V.1. Component Cooling Water System, second paragraph)

Existing Wording:

Loss of the CCW system during post-accident operation was considered in the Provisional Operating License review of Ginna, and it was concluded that the RHR pumps could continue to operate to recirculate containment sump water with decay heat being removed by the containment fan coolers. However, because the CCW system cools the bearings and lubricating oil coolers for the RHR (and other ECCS) pumps, these pumps would not be available to recirculate the sump water. Current criteria for piping system passive failures do not require the assumed passive failures of moderate energy systems (like the CCW) under post-accident conditions, although system leaks are assumed (Ref. 7). Therefore, the CCW system makeup capability should be capable to cope with normal system leakage in post-accident operation.

Recommended Wording: (proposed changes are underlined)

Loss of the CCW system during post-accident operation was considered in the Provisional Operating License review of Ginna. During the injection phase component cooling water is not essential to be supplied to the safety related pumps for their mechanical seals (safety injection pumps, containment spray pumps and residual heat removal pumps) or bearing water jackets (residual heat removal pumps), because the pumped fluid originates from the Boric Acid Storage Tanks and refueling water storage tank (RWST). During the recirculation phase component cooling water is necessary to cool these components, since the sump water temperature is expected to be high (above 212°F). This assumed continued operation of CCW is acceptable because current criteria for piping system passive failures do not require the assumed passive failures of moderate energy systems (like the CCW) under post-accident conditions, although system leaks are assumed (see Standard Review Plan Section 9.2.2). The CCW system makeup capability should be capable to cope with normal system leakage in post-accident operation.

ATTACHMENT A

R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.4: (see page 15 of SER, section 3.0, REFERENCES)

Existing wording:

7. Staff Discussion of Twelve Additional Technical Issues Raised by Responses to November 3, 1976 Memorandum from Director, NRR to NRR Staff, NUREG-0153, Issue #17, December 1976.

Recommended Wording:

7. DELETED (note that Reference 7 only discusses passive mechanical valve failures)

CLARIFICATION NO.5: (see page 7 of SER, section V.2 Service Water System, first paragraph)

Existing Wording:

The Service Water System (SWS) circulates water from the screen house on Lake Ontario to various heat exchangers and systems in the containment, auxiliary and turbine buildings. These buildings are Class I structures except for the turbine building. The system has four pumps, three of which are in operation during normal plant operating conditions. As described in the previous CCW section, two SWS pumps are required to remove heat from components under post-accident conditions.

Recommended Wording: (proposed changes are underlined)

The Service Water System (SWS) circulates water from the screen house on Lake Ontario to various heat exchangers and systems in the containment, diesel generator, intermediate, auxiliary and turbine buildings. These buildings are Class I structures except for the turbine building. The system has four pumps, either two or three of which are in operation during normal plant operating conditions. As described in the previous CCW section, plant service water load requirements dictate that one SWS pump is required during the post-accident injection phase and that two SWS pumps are required to remove heat from components during the sump recirculation phase of post-accident conditions.

ATTACHMENT A

R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.6: (see page 7 of SER, section V.2 Service Water System, second paragraph)

Existing Wording:

The SWS piping is arranged so that there are two flow paths to the redundant "critical"* loads identified in Table 2. Another header supplies various "non-critical" loads (see Table 3). The "non-critical" loads are automatically isolated from the "critical" headers by redundant motor operated valves when a reactor safeguards actuation signal occurs. Redundant motor operated isolation valves also automatically secure SWS flow to the air conditioning chill water system, circulating water pumps, and screen wash supply on a safeguards actuation signal.

Recommended Wording: (proposed changes are underlined)

The SWS piping is arranged so that there are two flow paths to the redundant "critical"* loads identified in Table 2, and to the "non-critical" Reactor Vessel Cavity Coolers and Containment Penetration Cooling loads listed in Table 3. Branch headers supply various "non-critical" loads (see Table 3). Redundant motor operated valves are provided to automatically isolate the "critical" headers from the CCW heat exchangers, the spent fuel pool cooling heat exchanger, and the "non-critical" headers. The redundant valves within each pair are powered from independent 480-V buses. The motor operated valves within each independent train will automatically receive a close signal following a safeguards actuation signal concurrent with a trip of the normal supply breaker on their associated 480-V bus. These valves will then close automatically upon reenergization of their associated 480-V electrical bus by its diesel generator.

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R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.7: (see page 8 of SER, section V.2 Service Water System, first paragraph)

Existing Wording:

During normal plant operation, the SWS supplies flow to all loads except the standby auxiliary feed systems. During RHR operation for a normal plant cooldown, almost all "non-critical" loads may be removed from the SWS, if necessary. Following a safeguards actuation signal, the SWS supplies all "critical" loads except the backup feedwater supply to the auxiliary and standby auxiliary feed systems, which require operator action to receive SWS flow.

Recommended Wording: (proposed changes are underlined)

During normal plant operation, the SWS supplies flow to all necessary loads except pump suction flow to the auxiliary feedwater, and standby auxiliary feedwater systems. During RHR operation for a normal plant cooldown, almost all "non-critical" loads may be removed from the SWS, if necessary. Following a safeguards actuation signal (with bus undervoltage) the SWS continues to supply all required "critical" loads except the supply to the auxiliary feedwater system and the standby auxiliary feedwater system, which require operator action to receive SWS flow.

ATTACHMENT A

R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.8: (see page 8 of SER, section V.2 Service Water System, second paragraph)

Existing Wording:

To overcome single failures in the system each "critical" load has a redundant counterpart cooled by the other "critical" SWS header. If necessary, an operator could cross-connect the "critical" headers by means of manual valves to achieve added system flexibility. In the normal system alignment, no single active or passive failure could result in the loss of SWS flow to redundant "critical" loads except for the reactor vessel cavity coolers which could both be disabled by a single passive failure. Since the SWS is a moderate energy system, a passive pipe failure would probably result in a leak rather than a complete pipe rupture. Using the method described in Reference 5, the estimated leakage for a SWS header is 585 gpm for a 20" header at 75 psig. Although this leak may cause a flooding problem, the supply function of the affected header would not be significantly impaired.** A leak from the 2.5" supply line to the reactor cavity coolers would result in the loss of about 25 gpm. This leak rate would not completely disable the coolers which normally receive about 45 gpm of SWS flow.

Recommended Wording: (proposed changes are underlined)

To overcome single failures in the system each "critical" load has a redundant counterpart cooled by the other "critical" SWS header. If necessary, an operator could cross-connect the "critical" headers by means of manual valves 4610 and 4779 (in the 20-in supply loops) to achieve added system flexibility. In the normal system alignment, no single active or passive failure could result in the loss of SWS flow to redundant "critical" loads, although the "non-critical" reactor vessel cavity coolers could both be partially disabled by a single passive failure. Since the SWS is a moderate energy system, a passive pipe failure would probably result in a leak rather than a complete pipe rupture. Using the method described in Reference 5, the estimated leakage for a SWS header is 585 gpm for a 20" header at 75 psig.

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R. E. GINNA STATION

SEP TOPIC IX-3, "SERVICE WATER AND COOLING WATER SYSTEMS"

Corrections to NRC SER contained in NRC letter dated November 3, 1981 from Dennis M. Crutchfield (NRC) to John E. Maier (RG&E)

CLARIFICATION NO.8: (see page 8 of SER, section V.2 Service Water System, second paragraph)

Recommended Wording: (continued)

Although this leak may cause a flooding problem, the supply function of the affected header would not be significantly impaired.** A leak from the 2.5" supply line to the "non-critical" reactor coolers would result in the loss of about 25 gpm. This leak rate would not completely disable the coolers which normally receive about 45 gpm of SWS flow.***

***Since the purpose of this review is to compare Ginna to the SRP, such passive failures are discussed. However, the Ginna licensing basis for the Service Water System requires that post-LOCA operating requirements are met, assuming a single active failure (AIF-GDC 41)

CLARIFICATION NO.9: (see page 8 of SER, Table 2. "CRITICAL SWS LOADS", item 7)

Existing Wording:

Standby Fuel Pool Cooling

Recommended Wording: (proposed changes are underlined)

Spent Fuel Pool Cooling