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See Reports

SUBJECT: Forwards "RE Ginna Nuclear Power Plant Evaluation of Adequacy of Existing Ex-Core Neutron Flux Instrumentation for NUREG-0737,Suppl 1." Rept addresses five open issues in NRC SER issued on 901204.

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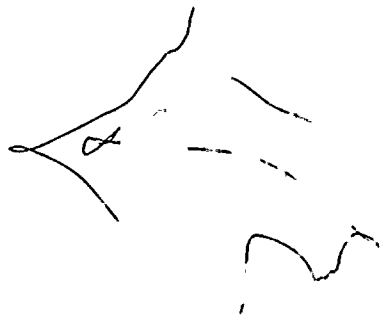

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May 6, 1991

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

Subject: NUREG-0737, Supplement 1/Regulatory Guide 1.97
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Johnson:

The NRC issued a Safety Evaluation Report (SER) on December 4, 1990 relative to the RG&E submittal concerning conformance with NUREG-0737, Supplement 1, paragraph 6.2 as applied to Regulatory Guide 1.97. In the SER, the NRC found that the RG&E program is acceptable, with the exception of five issues:

1. Accumulator tank pressure
2. Neutron flux instrumentation
3. Containment isolation valve position indication
4. RHR heat exchanger outlet temperature
5. Emergency ventilation damper position

Attachment 1 addresses RG&E's response to items 1,3,4 and 5. Attachment 2 provides the RG&E position on item 2, neutron flux instrumentation. This latter report proposes an "Adverse Containment Subcriticality Status Tree" to be incorporated into the Ginna Emergency Operations Procedures. Prior to formal implementation this tree will undergo normal review including simulator validation. Some changes to the tree may take place as a result of this process. The report demonstrates that, under dynamic accident conditions, the proposed instrumentation (primarily core exit thermocouple) is more suitable for monitoring core reactivity than flux instrumentation. As described in Section 3.1.1 of the report, excore neutron flux measurements during post-accident transient conditions can provide inaccurate measurements, due primarily to decreased fluid density in the downcomer, with the resultant increased neutron leakage from the core to the detectors. Furthermore, the use of the proposed alternative instrumentation has a significantly higher benefit/cost ratio. RG&E considers that our proposal of alternative instrumentation is consistent with the guidance provided in NUREG-0737, Supplement 1, as noted in Generic

Letter 82-33. For example, GL 82-33 states that, "...the guidance documents...are not to be used as requirements, but rather...they are to be used as sources of guidance...". Supplement 1 to NUREG - 0737 states that "...It is not intended that these guidance documents (NUREG reports and Regulatory Guides) be implemented as written; rather, they should be regarded as useful sources of guidance for licensees and NRC staff regarding acceptable means for meeting the fundamental requirements contained in this document..."

RG&E has never disputed the fundamental requirements contained in NUREG-0737, Supplement 1, as it applies to post-accident monitoring. We have installed or upgraded numerous instrumentation systems, including Core Exit Thermocouples, High Range Radiation Monitors, Reactor Vessel Level Instrumentation System, Hydrogen Monitors, and Subcooling Meters, and have committed to upgrades to redundant steam generator wide range level and RHR flow instrumentation. These decisions have been based on our concurrence for the need for the installations or upgrades.

For the exceptions RG&E has taken to the guidance contained in NUREG-0737/RG 1.97, we have determined that our present systems are acceptable, particularly with the compensatory measures we have suggested in place of environmentally qualified neutron flux instrumentation. Previous NRC correspondence relative to these exceptions have not addressed RG&E's technical alternatives. RG&E has provided detailed information regarding the methods for meeting the fundamental requirements. We request that future NRC correspondence specifically address the technical merits of our statements.

It is noted that, in the NRC's SER of December 4, 1990, references are made to the fact that Regulatory Guide 1.97 intends to provide instrumentation to cover a wide range of possibilities, including conditions not necessarily anticipated following standard event analysis defined paths. Specifically, this is given as a basis for the need for qualified neutron flux and RHR heat exchanger outlet temperature instrumentation. RG&E does not agree with this logic. It implies that the post-accident monitoring instrumentation should be designed to provide information under events and conditions not anticipated from analyses following normally considered event scenarios. Yet the environmental qualification conditions which the Regulatory Guide 1.97 guidance suggests should be the basis for design of the instrumentation is precisely that resulting from the analyses which follow normally considered event scenarios. This suggests that plants be designed for the unknown, in an undefined unbounded manner. However, RG&E will consider events beyond our present design basis as indicated in our response to Generic Letter 88-20 regarding IPE/PRA and in our July 13, 1990 response to NUREG-0737/RG 1.97. We have stated that we will consider "beyond-design-basis-events" and that, if warranted as part of our Severe Accident Management strategy, additional upgrades of equipment or procedures could occur.

Environmental qualification of source range neutron flux instrumentation and RHR heat exchanger outlet temperature will be considered within that context. However, upgrades to respond to design basis events as part of our NUREG-0737/RG 1.97 implementation plan are not technically justified.

Very truly yours,

Robert C. Mecredy

Robert C. Mecredy

GJW/kaw:158

Attachment

xc: Mr. Allen R. Johnson (Mail Stop 14D1)
Project Directorate I-3
Washington, D.C. 20555

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
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Ginna Senior Resident Inspector

ATTACHMENT 1

Regulatory Guide 1.97 Review

The responses below are ordered to be consistent with the USNRC correspondence concerning emergency response capabilities dated December 4, 1990.

3.0 a) Accumulator Tank Pressure

RG&E continues to maintain that environmental qualification for Type D accumulator pressure instrumentation is not appropriate. As stated in the SER this is an industry wide issue. We will defer further response until the NRC completes its generic review of this item.

3.0 c) Containment Isolation Valves

RG&E agrees with the stipulation of the Technical Evaluation Report that the intention of the recommendations in Regulatory Guide 1.97 is to provide the operator with a complete picture of what is taking place in the plant. However, the degree of instrument qualification and hence backfitting should not be arbitrary. Rather it should be based on technical evaluations specific to each plant. RG&E does not feel that environmentally qualified isolation valve position indication is technically justified at Ginna.

Post-accident harsh environments can exist for two distinctive categories of containment isolation valves at Ginna - those located outside containment and those located inside containment. For valves outside containment the harsh environment is only seen during sump recirculation or sampling phases following an accident. This can only occur after the automatic containment isolation signal has been manually defeated. This is well after the operator has verified successful completion of containment isolation by observing the containment isolation valve status indicators. Even at this time the environment is only considered harsh from a radiation shine standpoint on the order of 10^5 Rads. RG&E feels that it is reasonable to expect commercial switches to survive this environment. For these two reasons RG&E feels that environmental qualification for containment isolation valves outside containment is not needed.

Three categories of motor or air operated containment isolation valves (a total of seven valves) exist in the Ginna containment building:

1. Normally Open/Fail Closed air operated valves.

2. Normally Closed/Failed Closed air operated valves.

3. Locked closed motor operated valves.

Three parallel valves (one penetration) fit in the first category (letdown orifice valves 200A, 200B and 202). The redundant isolation valve for this penetration is located outside containment with position indication and control available in the control room. In the event that a letdown orifice valve failed to indicate closed following automatic containment isolation, the operator is instructed to attempt to close the valve(s) from the control board and to verify closure of the outboard valve. No actions outside the control room are specified. If the indication indicated closed when in fact the valve remained open the operator may incorrectly assume the valve closed. However, the outboard isolation valve and indication would also have to fail in this manner for the containment to not be isolated without immediate operator identification. Even in this case, letdown flow indication would soon alert the operator to this problem.

Two valves fit into the second category, containment mini-purge suction and discharge valves 7971 and 7478. Both have redundant valves, also normally closed, outside containment with remote indication and control in the control room. The same discussion as for the valves in the first category applies here.

Two valves fit into the third category, RHR suction and discharge inboard valves 701 and 720. These valves are closed with the breakers locked open. Again redundant isolation valves outside containment with control room indication exists. Failure open of the inboard valves is not considered credible and no operator action is based on the position indication.

3.0 d) RHR Heat Exchanger Outlet Temperature

Post accident RHR system performance, as well as the performance of any other decay heat removal method, is sufficiently monitored by environmentally qualified Category 1 RCS Loop T_{hot}, T_{cold}, core exit temperature (CET), and sump temperature indications. These indications provide the basis in the Ginna EOPs for operator actions regarding core decay heat removal. RG&E feels that these redundant and qualified indications provide an adequate alternative to RHR heat exchanger outlet temperature in determining RHR system performance as stipulated in the Safety Evaluation Report. RG&E

feels that further upgrade of the RHR heat exchanger outlet temperature is therefore not warranted.

3.0 e) Emergency Ventilation Damper Position

The six inch mini-purge valves 7970, 7971, 7445, and 7478 are air operated normally closed valves. They are under strict administrative control, and are opened only for discrete periods during which they are continuously monitored. Furthermore, all four valves are containment isolation valves and receive automatic containment isolation signals. The qualification of position indication relative to this is discussed above in the response to 3.0c. Any repositioning of the valves could only take place by manual operator action following reset of the containment isolation signal, at which time the mini-purge supply fan is started. In the event that valve position indication failed (in this case both open and closed position) proper alignment of the valves would easily be inferred from proper operation of the mini-purge supply fan, which is interlocked with the outboard discharge valve.

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