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SUBJECT: Forwards response to SEP Topic VI-4, "Containment Isolation Sys," NUREG-0821 open issues. Util positions described during ACRS subcommittee & full committee meetings on 820630 & 0708, respectively..

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August 30, 1982

Director of Nuclear Reactor Regulation
Attention: Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: SEP Topic VI-4, Containment Isolation Valves (Systems)
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Crutchfield:

Rochester Gas and Electric has reviewed the section of NUREG-0821, SEP Integrated Plant Safety Assessment for the Ginna plant, dealing with the containment isolation provisions of SEP Topic VI-4. We would like to restate our position with respect to those containment isolation provisions on which the NRC staff and RG&E previously disagreed. These are provided in the attachment. Most of these positions have previously been described during the ACRS subcommittee and full committee meetings of June 30 and July 8, 1982 respectively. A schedule for the actual implementation of our proposed modifications will be provided once NRC agreement to our proposals is received.

RG&E also noticed an error in the NRC's topic assessment VI-4, dated April 12, 1982. In the assessment paragraph V.5, it is noted that for the containment sump recirculation lines, the difference from the explicit wording of General Design Criterion 56 consists only of valve actuation (remote manual valves vs. automatic). Actually, the MOV's inside containment are not used to provide a containment isolation function, or any other post accident function. They are maintained in an open position. No environmental qualification for the operators is available, or claimed, as noted in RG&E's Environmental Qualification submittals. Nonetheless, these containment penetrations have acceptable valving arrangements, per the "other defined basis" of GDC56. A single isolation valve is acceptable, as provided in SRP 6.2.4, paragraph II.6.e, because the safeguards function, sump recirculation, can be more reliably assured with a single valve in each flow path. A single active failure is accomodated by the redundant flow paths. The residual heat removal system is a closed system outside containment designed to seismic category 1 standards, is classified Safety Class 2 had has a design temperature and pressure greater than that of the containment. The RHR piping has been recently reanalyzed under our seismic upgrade program. The sump

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recirculation lines between the containment wall and the isolation valves outside containment do not have calculated stress levels which exceed 0.4 (1.2 S_h + S_A) as defined in the ASME code and as specified in SRP 3.6.2. Thus, long term passive failures need not be considered in this piping. Additional reasons for not considering pipe ruptures in this piping following a LOCA are given in the NRC evaluation of Topic VI-7.D. Valve packing leaks from these gate valves can be isolated simply by closing the leaking valve and thus removing containment pressure from the packing. Further, any leakage into the auxiliary building would be filtered prior to release. The valve packing is subject to an annual test during the RHR system pressure test and is inspected under the leak reduction program instituted since TMI.

Based on the above reasons, the present Ginna valving arrangement for penetrations 141 and 142 are acceptable, based on current criteria, and thus no modification to the Integrated Assessment discussion is required.

Very truly yours,

John E. Maier

Attachment

Attachment: RG&E Response to VI-4
Open Issues as listed in NUREG-0821

1. Penetration 108 - This is the seal water return and excess letdown line. The NRC recommended that a second automatic containment isolation valve should be added to this line, preferably inside containment. RG&E proposes to implement this modification. However, we have not yet determined the most suitable location for the additional valve (inside or outside containment). Based on the evaluation in paragraph 4.22.1 of NUREG-0821, concluding that two valves outside containment provided comparable protection to one valve inside and one valve outside, the final location of this valve should not have a bearing on the final assessment.

2. Penetration 110b - This is the safety injection test line. The NRC's position was that RG&E should close manual valves 884 and 882, and leak test them. As part of RG&E's detailed review of the containment isolation provisions for this penetration, it was noted that two check valves, which are periodically tested for leakage as part of the Event V configuration testing, separate this penetration from each Reactor Coolant System cold leg. A locked closed valve separates this penetration from each Reactor Coolant System hot leg, and a fail-closed valve separates this penetration from the accumulators. Thus, several barriers exist at these containment penetrations to prevent the escape of post-accident radiation. These lines are also connected vertically to the Reactor Coolant piping and accumulators, such that a water seal would help prevent leakage. Further, since this is the Safety Injection Test line, it would be pressurized during Safety Injection by the SI system in the event of an accident.

   Given the fact that there is a containment isolation valve already in the line, that there are other additional valves which would be expected to serve an isolation function if necessary, and that the line would be pressurized or filled with water following an accident, RG&E considers that the present arrangement provides high assurance that no post-accident leakage would be released to the environs via this containment penetration. Thus, we do not propose to designate any additional containment isolation valves to this penetration, or require more stringent leak-testing of the valves now installed.

3. Penetration 121a - This is the nitrogen-to-pressurizer relief tank line. The NRC's position is that RG&E should lock-closed manual valve 547, and leak test it per 10CFR50, Appendix J, type C.

RG&E plans to implement this change. Valve 547 does need to be opened briefly when nitrogen gas is to be added to the PRT. This is performed primarily during startup and shutdown, during cold shutdown conditions, and only occasionally during power operation, and has a duration of about an hour. Thus, these brief intervals are considered to have no substantial effect on the containment isolation status of the plant, especially since this valve is the redundant counterpart to check valve 528.

4. Penetration 129 is the nitrogen-to-reactor coolant drain tank line. The NRC's position is that RG&E should lock-close manual valve 1793, and leak test it.

   RG&E plans to implement this change. Similar to 3 above, the valve does need to be opened briefly on occasion. After additional evaluation of the physical arrangement of the present system, RG&E may propose to use existing vent and drain connections to perform the testing; thus, this valve may be tested in the reverse direction. Since this is a gate valve with very similar characteristics in each direction, we believe this alternative to be acceptable.

5. Penetrations 120b, 123, and 305a - These are the gas analyzer lines and the containment air sample line. The NRC position is that a second automatic isolation valve should be added to each line.

   RG&E does not believe that the installation of additional valves in these lines would be a reasonably cost-effective backfit. As pointed out in the Sandia Probabilistic Risk Assessment for Ginna (based on WASH-1400 methodology), a small amount of containment leakage following a postulated accident is a negligible contributor to overall risk. Substantial confidence is already provided that these containment penetrations will not release containment atmosphere, since these are air-operated fail-close automatic containment isolation valves, located near the containment wall. Both the piping and valves are designated as Seismic Category I. The history of operation of these valves disclosed no previous failure to close.

   Based on these factors, RG&E does not consider that any modifications to these containment penetration arrangements are warranted, and that the present arrangement should be "acceptable on some other defined basis..." per GDC 55 and 56, due to the reliability of the present valves, and the negligible safety benefit to be derived from any backfitting.

6. Penetrations 301 and 303 - These are the auxiliary steam heating lines to the containment. The NRC staff position is that RG&E should add a closed valve, preferably inside containment, to each penetration.

RG&E proposes that valves 6165 and 6152 be designated containment isolation valves, in lieu of adding valves inside containment. By present procedure, these valves are already locked-closed, and leak-tested. This arrangement is consistent with the logic in paragraph 4.22.1 of the draft IPSAR, that two valves outside containment give essentially the same level of protection as one inside and one outside containment.

7. Penetrations 201 and 209 - These are the penetrations for the reactor compartment coolers. In paragraph 4.22.4 of the draft IPSAR, the NRC states that RG&E should verify that this system is a safety-grade closed system inside containment. RG&E has verified that such is the case; the system is designated as Seismic Category I, and is located outside the missile barrier.

   The staff also states that the manual valves should be changed to remote-manual valves, and should be leak-tested. RG&E's rationale for allowing use of the present arrangement of manual valves, but adding leak testing requirements, is explained in the discussion of the service water lines to the fan coolers below. That same rationale applies to these penetrations also.

8. Penetrations 308, 311, 312, 315, 316, 319, 320, and 323 - These are the Service Water lines to and from the containment fan coolers. The NRC position is that RG&E should change the manual inlet and outlet butterfly valves to remote manual, and leak test them. RG&E proposes an alternative modification which would result in acceptable containment isolation capability for these lines, but provide a more favorable cost/benefit value, consistent with the philosophy of SEP to optimize backfitting decisions. RG&E's alternative is to upgrade the manual butterfly valves, as necessary, with manual valves which could meet leakage requirements defined to be acceptable from a radiological release standpoint. An existing test connection would be used to perform penetration leak testing by means of a hydrostatic test. Thus, the inlet valves would be tested in the reverse direction. We propose that this system hydrostatic test be performed in lieu of Appendix J type C testing, and that the leakage be excluded when determining the combined leakage rate (per Appendix J, Section III.C.3.a and III.C.3.b).

   Present regulatory practice requires that a single active failure be taken in the short term, or a single passive failure be taken in the long-term (24 hours), following an accident. The maximum leakage from a passive failure would be that resulting from valve packing or fan cooler tube failures (not a pipe crack). RG&E will evaluate this resultant leak rate to ensure that this leak rate would not degrade the ability of the Service Water System to perform its required safety function, and maintain a water seal on the Service Water piping. Following this evaluation, a radiological

source term will be defined, based on conservatively calculated consequences of a LOCA, a forcing function will be determined based on containment and service water pressures at the time of the assumed passive failure, and an acceptable valve seat leak rate will then be determined. This leak rate will form the basis for the acceptance criteria of the hydrostatic leak test to be performed to determine system integrity. RG&E expects this evaluation to be completed by November, 1982.

RG&E estimates that the cost of upgrading the manual valves with remote manual valves is several million dollars. The cost of upgrading the manual butterfly valves with manual valves which will meet leakage requirements to be defined as above would be substantially less.

RG&E's technical rationale for this proposed alternative modification are:

a. The system is completely located outside the missile shield, and is seismic.

b. The service water pressure at the inlet to the coolers is higher than the highest calculated post-accident pressure. Thus, there would always be positive pressure at the coolers, preventing the release of any post-accident containment atmosphere. At the fan cooler outlet, the pressure is about 15 psig. Thus, the service water pressure is higher than containment pressure except for about 2-3 hours immediately following a LOCA.

c. Ginna has experienced only one very minor fan cooler leak. The cause of that leakage was due to corrosion of a carbon steel plug. These have been replaced with copper plugs.

d. The valves outside containment are in an accessible area, and could be manipulated by personnel locally. The calculated radiation field following a LOCA, even assuming a TMI source term, is approximately 3 rad/hr. Assuming a source term consistent with 10CFR 50.46 acceptance criteria, the dose rate would be approximately an order of magnitude lower.

e. Although not expected to be used, backup isolation capability is available by closure of valves 4561 and 4562. This would entail complete isolation of the containment fan coolers. However, RG&E does have a completely redundant and diverse containment spray system, which could effect the necessary containment atmosphere cleanup and cooling functions.

f. The area outside containment near the penetrations is congested, and remote operators would be very difficult to install.