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Georgia Power
the southern electric system

LCV-0538

Docket Nos. 50-424
50-425

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

VOGTLE ELECTRIC GENERATING PLANT
ENCAPSULATION VESSELS
REQUEST FOR ALTERNATE TESTING CRITERIA

Pursuant to the provisions of 10 CFR 50.90, Georgia Power Company (GPC) hereby requests Nuclear Regulatory Commission (NRC) approval of alternate testing criteria to that originally approved by the NRC in section 6.2.4 of NUREG-1137, "Safety Evaluation Report related to the operation of Vogtle Electric Generating Plant, Units 1 and 2" (SER) for the containment sump recirculation piping.

The containment sump recirculation piping, which supplies suction to the RHR pumps and the containment spray pumps, are each provided with a single isolation valve outside containment. In NUREG-1137, the NRC considered this to be a deviation from an explicit requirement of General Design Criteria (GDC) 56 since there is no isolation valve inside containment. Since this was a deviation from GDC 56, GPC installed an encapsulation vessel around the valve to confine leakage which might occur between the valve and the containment in conformance with NUREG-0800, Standard Review Plan (SRP), section 6.2.4. At that time GPC committed to perform 10 CFR 50, Appendix J, Type B testing on the encapsulation vessels. Due to the difficulties of Type B testing relative to this design and the radiation dose levels personnel can receive in performing this test, GPC proposes alternate testing provisions.

The proposed alternate testing provisions and their associated bases are described in the enclosure. In order to proceed with changes to the commitment of testing these encapsulation vessels in accordance with 10 CFR 50, Appendix J in a timely manner, GPC requests NRC approval by March 1, 1995.

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In addition to savings on overall man-rem exposure this requested change is a Cost Beneficial Licensing Action (CBLA) and will provide estimated savings of approximately $200,000 over the life of the plant.

Sincerely,

C. K. McCoy

CKM/CRP/gmb

Enclosure

c(w): Georgia Power Company
Mr. J. B. Beasley, Jr.
Mr. S. H. Chesnut
Mr. M. Sheibani
NORMS

U. S. Nuclear Regulatory Commission
Mr. S. D. Ebneter, Regional Administrator
Mr. D. S. Hood, Licensing Project Manager, NRR
Mr. B. R. Bonser, Senior Resident Inspector, Vogtle

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Request:

Georgia Power Company (GPC) requests NRC approval to allow alternate leakage testing provisions for the encapsulation vessels on the recirculation suction lines. These encapsulation vessels are currently being tested to Appendix J, Type B criteria. Georgia Power Company proposes that the encapsulation vessels be alternately tested by pressure decay or flow test methods. Leakage from these vessels will be included as part of the ECCS Leakage Assessment Program as required by Technical Specification 6.7.4.a.

Background:

As discussed in the Vogtle Electric Generating Plant (VEGP) FSAR sections 3.8.2.1.4 and 6.2.6.2, the VEGP recirculation suction lines (penetrations 36 through 39) employ a single containment isolation valve outside the main containment structure. A typical drawing of this arrangement can be found in the attached figure. It is not practical to install containment isolation valves inside containment because the containment basemat is located just inside the main containment structure. Therefore, VEGP installed leaktight housings known as encapsulation vessels up to and including the first isolation valve. As such, these vessels were subject to ASME III Class MC fabrication and construction requirements. In SER section 6.2.4, the NRC noted that this arrangement was a deviation from GDC 56 requirements since there is no isolation valve inside containment. After confirming that these vessels were to be tested to 10 CFR 50, Appendix J, Type B requirements, the NRC staff determined that these provisions for the sump recirculation lines were an acceptable alternative to the explicit requirements of GDC 56.

Since the encapsulated valves actuate for emergency sump operation as a part of the emergency core cooling system, MOV valve testing is necessary at least every three refueling outages in accordance with VEGP's commitments to Generic Letter 89-10. (Normal valve stroking, in accordance with Specification 3.5.2, is observed through a port installed in the last refueling outage on Unit 1 and planned for future installation on Unit 2). Preventive maintenance is also performed on the encapsulated valves every other refueling outage. In order to perform MOV testing or preventive maintenance on the valve, the encapsulation vessel was designed with a large removable head. A gasket is used between the head and the body. Prior to opening this head area, it is necessary to perform an "as-found" local leak rate test (LLRT). After closing the head area, it then becomes necessary to perform an "as-left" LLRT. In the past, because of the gasket

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material and the size of the gasketed area, it has been very difficult for the encapsulation vessel to pass its LLRT test. This problem has recently been solved with the introduction of a new gasket material. However, due to the size of the gasketed area and the properties of the current gasket material, it is necessary to torque the vessel heads twice with a twenty-four hour hold period between torques to allow for gasket relaxation. These encapsulation vessels are also located in radiation areas which are sometimes exposed to radiation fields in excess of 100mr/hr so there can be significant man-rem exposure in performing this maintenance. The granting of this request will reduce the man-rem exposure and manpower by modifying the acceptance criteria for the test to a pressure more consistent with the accident analyses by using relaxed testing criteria and also by reducing the number of tests performed on the encapsulation vessels since it would only be necessary to perform an "as-left" leakage test.

Basis:

The piping from the containment building sump to the containment isolation valve (located inside the encapsulation vessel) is enclosed in a leaktight, concentric guard pipe. This guard pipe is welded to the suction piping at a point inside the containment and thus forms a leaktight seal. This leaktight seal, which is subject to the containment integrated leak rate test (Type A), is designed so that neither the vessel nor the guard pipe interact directly with the sump or containment atmosphere. Therefore, the encapsulation vessels and guard pipe are not a part of the direct barrier between the containment atmosphere and the external environment. However, because the encapsulation vessel test leakage results are currently included in the 10 CFR 50, Appendix J testing program, the leakage results of the "as-found" test can be and have been a penalty in the Integrated Leak Rate Test (ILRT). The inclusion of this leakage as a penalty into the Appendix J testing program makes little sense since the recirculation piping has a water seal after a LOCA. Since the encapsulation vessels do not communicate directly with the containment atmosphere, the application of the leakage as a penalty into the ILRT is unnecessary.

Similarly, the LLRT results from the encapsulation vessels are totaled in accordance with 10 CFR 50, Appendix J, Type B testing criteria. However, as discussed above, the vessels do not provide a direct leakage path out of containment so this inclusion is not necessary.

It is proposed that the encapsulation vessels continue to be leak-tested but not under the LLRT program. The proposed leak-testing provisions will establish an allowable leakage rate based on the ECCS Leakage Assessment Program required by Technical Specification 6.7.4.a.. The testing will be conducted using the pressure decay or flow test methods at a

starting pressure of 30 psig in the encapsulation vessels. This test pressure is less than the test pressure of Pa (37 psig) but justified as discussed below based on the unique application of the encapsulated valves.

Leakage from an encapsulation vessel first assumes that a passive failure of the recirculation piping or an encapsulated valve has occurred. This could be from the result of a cracked pipe or valve body or a valve packing leak. In any case, the leakage from the passive failure cannot exceed the leakage allowed by the encapsulation vessel. Leak from the encapsulation vessel will be significantly less that the "worst-case" recirculation system leakage assumed for any VEGP analyses of 2 gpm during an accident. It should be noted that piping leaks, valve packing leaks, or flange gasket leaks have been of a nature to build up slowly with time and are considered less severe than the pump seal failure.

Any leakage from the encapsulation vessels is and will continue to be monitored by an area leakage detection system. These leakage detection systems are discussed in FSAR section 9.3.3. For each of these areas, a high-level indication light is provided in the control room with a common high-level alarm for each area.

The reduced pressure testing is also justified based on the current plant licensing basis for long-term operation in the recirculation mode. In addition to the event (in this case, the LOCA), one active failure is to be assumed in the short-term or one failure, active or passive, is to be assumed in the long-term, whichever creates the worst-case situation (Ref. FSAR section 6.3.2.5). In this case, an active failure would not result in increased radioactivity releases to the environment. However, as discussed above, a passive failure can result in some amount of leakage. During the long-term recirculation mode, the water pressure of the recirculation suction piping enclosed in the encapsulation vessel will not exceed the long-term containment pressure plus the static head of the water in the containment sump. The pressure due to a static water head is about 6 psig and the long-term pressure, based on the recently approved uprate containment temperature-pressure analyses, is about 23 psig. These containment pressure-temperature analyses were supplied to the NRC by GPC letter dated February 28, 1992, in support of uprate and have been included in the FSAR Update. Therefore, testing the encapsulation vessels at 30 psig is consistent with the plant analyses.

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Conclusion:

As discussed above, NRC approval of GPC's proposed alternate testing provisions will provide testing consistent with the overall plant design and accident analyses. Plant safety is not adversely affected and overall man-rem exposure and GPC costs are reduced. Testing will still be conducted to assure that the encapsulation vessels maintain an adequate barrier against pipe cracks or valve leakage during a LOCA. The encapsulation vessel will remain as a barrier against pipe cracks and packing leaks in the VEGP licensing basis.

Figure

Simplified Layout of VEGP Encapsulation Vessel