UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

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JAN 2 7 1984

MEMORANDUM FOR: B. J. Youngblood, Chief, Licensing Branch No. 1, Division of Licensing

FROM: Olan D. Parr, Chief, Auxiliary Systems Branch, Division of Systems Integration

SUBJECT: FOLLOWUP ACTIONS FOR THE CALLAWAY INTEGRATED DESIGN INSPECTION (TIA 84-04)

In accordance with Task Interface Agreement (TIA) 84-04 and your December 1, 1983 memorandum to me, the Auxiliary Systems Branch has reviewed Findings 2-1 and 2-7 of Region III's integrated design inspection. Our review included the applicant's responses to the findings. As a result of our review we conclude that the design is acceptable and the findings can be closed. The enclosed evaluation provides a description of our review and the bases for our conclusions. The only action required of the applicant is to revise the FSAR to accurately reflect the actual design.

Olan D. Parr, Chief
Auxiliary Systems Branch
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AUXILIARY SYSTEMS BRANCH
EVALUATION OF REGION III'S INTEGRATED DESIGN
INSPECTION AT CALLAWAY - FINDINGS 2-1 AND 2-7

By letter dated November 16, 1983 Region III requested NRR to complete the evaluation of Callaway's responses to two findings identified in the integrated design inspection performed at Callaway by Region III. We were requested to provide the followup and closeout actions necessary to resolve the two items (Findings 2-1 and 2-7). We have reviewed the applicant's responses and performed our own evaluation of the findings as described below.

Findings 2-1

This finding questions the design adequacy of the turbine-driven auxiliary feedwater (AFW) pump exhaust piping which is nonseismic Category I beyond the boundary of the seismic Category I auxiliary building. The finding states that the design provisions for the line are shown on FSAR Figure 10.4-10; however, it contends that the design is improper in that the exhaust piping design violates FSAR commitments related to the seismic design capability of the turbine driven AFW pump.

We were aware of the seismic/nonseismic interface in the turbine exhaust line during our review of the FSAR. We found the design acceptable on the same basis as indicated in the applicant's response to this finding that a complete severence of the pipe would not affect turbine operation and a significant amount of blockage is required to reduce the turbine driven pump flow below the design basis (the applicant states 90 percent).

It should also be noted that the turbine driven pump flow could be reduced by as much as 50 percent and still supply enough AFW flow to adequately remove decay heat. Even with a complete loss of the turbine driven pump, coupled with any single active failure, the AFW system can still deliver sufficient flow to adequately remove decay heat with one of the two motor driven pumps.

We have re-reviewed the design of the turbine driven AFW pump and determined that the conclusions reached in our original SER (NUREG-0830), that the AFW system is acceptable, are still valid. We, therefore, consider this finding resolved.

However, for clarification, we do request that in the next FSAR revision, the applicant update Section 5.4 of Table 3.2-1 to also reference Figure 10.4-10 and Figure 3.6-1, Sheet 49, which clearly show the routing and seismic classification of the AFW turbine exhaust line. This may help avoid any problems regarding FSAR content in the future, since Figure 10.4-9 which is now referenced in Table 3.2-1 does not show the turbine. Figure 10.4-10 shows the turbine but without Figure 3.6-1 it appears that the exhaust line does not pass through a nonseismic Category I structure. Therefore, further clarification of Figure 10.4.10 or a reference to Figure 3.6-1, Sheet 49 is necessary.

The FSAR text should also be revised to identify the section of nonseismic exhaust piping, and a brief discussion should be provided describing why it is acceptable. This discussion should be provided in Section 3.9(B) and/or Section 10.4.9.

Finding 2-7

This finding identified an apparent instance where a statement in the FSAR had not been implemented in the design. The statement was that there is no water drainage to lower elevations of the auxiliary building following a nonmechanistic break of a main feedwater line in the steam tunnel. The main issue of the finding is whether the effects of nonmechanistic breaks in the steam tunnel should be considered in the design basis of the rooms below the steam tunnel.

Our response to the latter part of this finding is yes, the effects of the nonmechanistic break in either the steam or feedwater lines should be considered for any areas that communicate with the tunnel. Our original statement to the applicant, that any equipment required for safe shutdown that is located within the steam tunnel should be environmentally qualified, was based on the assumption that the steam tunnel did not communicate with any areas containing safe shutdown equipment.

The steam tunnel has two 20 inch drain lines that are routed to the turbine building for the sole purpose of draining water in the event of a feedwater line break such that equipment in the tunnel need not be qualified for submergence. In the FSAR it was stated that there is no drainage to the lower levels of the auxiliary building. However, there are two four inch drain lines that drain from the tunnel to the auxiliary feedwater pump room sump located in the basement level of the auxiliary building. Flooding in the tunnel would cause drainage through the two four inch drain lines to the sump which would overflow to the auxiliary building basement floor. The drain system is designed such that back flooding through the drain system to the auxiliary feedwater pump rooms which are at elevations above the basement would not occur. Based on our flooding analysis, no safety-related equipment would be affected by the flooding of the basement floor. The level on the basement floor will be less than six inches, which is insufficient to affect any safety-related equipment. The safety-related equipment rooms in the basement have six-inch curbs and are provided with marine doors such that water would not enter these rooms for this event since they are designed for a flood level of seven feet.

For the postulated steam line break the amount of steam exiting through the small drain lines will be negligible due to the relatively small differential pressure resulting from the break (six psid maximum) for a short period of time (blowdown terminated in less than 10 seconds). Most of the steam exits through the overhead vent openings to the atmosphere (an effective flow area of 168 square feet). The effective flow area through the drain system is less than one square foot and most of the steam that flows into the drain system will go to the large basement level of the auxiliary building where it will disperse. The ventilation systems in the auxiliary building and room coolers will maintain environmental conditions within acceptable limits.

The applicant committed to revise the FSAR pipe break analysis for the steam tunnel such that the drain lines are identified. We reviewed the applicant's analysis of a pipe break in the steam tunnel taking into account the open drain system from the tunnel and concluded that a main feedwater or main steam line break would not prevent safe cold shutdown. We, therefore, conclude that the design is acceptable.