Background

(14)

Joe Holonich — urgent that action get started by NRR. See my list. I sent you! [illegible]

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

November 16, 1983

MEMORANDUM TO: B. J. Youngblood, Chief, Licensing Branch No. 1, NRR

FROM: R. C. Knop, Chief, Projects Branch No. 1, RIII

SUBJECT: FOLLOWUP ON CALLAWAY INTEGRATED DESIGN INSPECTION TEAM FINDINGS (AITS F03-057183)

The results of the NRC Integrated Design Inspection (IDI) at Callaway are documented in NRC Inspection Report 50-483/82-22. The licensee's response to the IDI findings and unresolved items was transmitted by a letter from D. F. Schnell to J. G. Keppler, ULNRC-636, dated June 15, 1983. During subsequent telephone conversations among Gordon Edison of NRR, Dennis Allison of IE, Cliff Hale of Region IV, and Jim Konklin of Region III, agreements were reached regarding responsibilities for follow up and close out of certain of the IDI team's findings. Those agreements were documented in a memorandum from C. E. Norelius to J. M. Taylor, dated October 7, 1983.

The purpose of this memorandum is to request that you provide the follow up and close out actions on findings F 2-1 and F 2-7 of Report 50-483/82-22, as agreed to by Dr. Edison during the above telephone conversations. Attached for your information are copies of the pages from the licensee's response which reiterate and discuss the two findings.

If you have any questions regarding the above, please call.

P. R. Pelke for
R. C. Knop, Chief
Projects Branch 1

Done 11/28

Attachment: As Stated

cc w/attachment:
J. G. Partlow, IE
D. P. Allison, IE
G. E. Edison, NRR
C. J. Hale, RIV
C. E. Norelius, RIII
R. L. Spessard, RIII
J. H. Neisler, Callaway SRI

(15)

Jim Konklin
Pelke
Callaway

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FINDING 2-1

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

RESPONSE

The response to this finding is divided into three parts which address 1) the design adequacy of the exhaust line 2) the compliance with the FSAR, and 3) the content of the FSAR.

1. Design Provisions

The design of the AFP turbine exhaust line was established during the early phases of the project and it was shown in the PSAR and the FSAR as being non-seismic Category I beyond the boundary of the auxiliary building.

The design was based on current licensing requirements for system operation following a single failure. The design flow rate is delivered by the system for all credible initiating events and has been accepted by the NRC during both the PSAR and FSAR review phases.

The following exhaust line failure mode considerations were evaluated in establishing the design:

(a) The auxiliary boiler building is designed to UBC seismic considerations and is not expected to fail during a seismic event.

(b) If the auxiliary boiler building were to catostrophically fail and the exhaust line were sheared off completely, the AFP turbine would operate properly.

(c) Even if the exhaust line were to crimp significantly, the AFP turbine driven pump would still deliver design flow rates. The back pressure on the turbine may be increased significantly before the required flow rates will not be available. A local constriction of 90% of the free area of the exhaust line is required before the design flow will not be delivered. This type of failure is not considered to be credible.

Breaks in seismic Category I piping are not postulated during a seismic event. Thus a MSLB or MFLB inside containment or in the steam tunnel are not postulated following a seismic event and the design of the exhaust line does not enter into the evaluation of these breaks.

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. The main issue 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.

RESPONSE:

In 1977 the NRC advised the SNUPPS utilities that the SNUPPS main steam tunnel room would have to be designed to withstand the pressure effects of a nonmechanistic break in a main steam or main feed line. The NRC also stated that any equipment required for safe shutdown located within the room should be qualified to the resultant environment. On March 9, 1978, the NRC accepted the design modifications and analyses provided by SNUPPS which allowed the venting of the structure and provided the parameters required for qualification of items within the room.

Flooding within main steam tunnel room from this nonmechanistic break was calculated. In order to ensure the integrity of the walls and to preclude the need for equipment qualification in a submerged condition, two twenty-inch drain lines were provided to drain the water to the turbine building. During preparation of the licensing submittal, note was taken of these large drain lines as well as certain sealed penetrations through the floor of the steam tunnel. it was erroneously assumed that there would be no drainage to the lower elevations of the plant even though the small drain lines were shown on the drainage system P&IDs. The FSAR will be revised to eliminate this error.

Although it was never SNUPPS' intent to extend the effects of this improbable, nonmechanistic break outside the steam tunnel, water drainage and steam escape through the small drain lines have been considered. Water drainage to lower elevations will not adversely affect safety-related equipment because the water goes to the auxiliary building basement which has a 7-foot design flood depth. Similarly steam escape is not likely to affect safety-related equipment due to the small driving force (steam tunnel pressure) and because fire dampers in the ventilation ducts close when the room temperature exceeds that normally anticipated. When the dampers close, the driving force equalizes, and passive heat sinks take effect to reduce room temperature.

For a seismically induced MSLB in the turbine building, various single failures can be postulated, none of which result in adverse conditions even if the AFP Turbine is inoperable. If an MSLIV fails to close, one steam generator will blow down; however, 2 motor driven AFW Pumps are available to feed 3 intact steam generators. If one motor driven pump train fails for any reason, the other motor driven pump will feed 2 steam generators as required. In this case the break has been isolated by the MSLIV and all 4 steam generators are intact.

The turbine driven pump subsystem is designed to be independent of AC power as required by the NRC for defense-in-depth to reduce the consequences of a total loss of all AC power. Loss of all AC power is not a design basis condition of SNUPPS since it would require failure of both of the diesel generators to start concurrent with a loss of offsite power. However, the design capabilities of the SNUPPS plants for this condition were evaluated by the NRC staff and the ACRS and were found to be acceptable.

The possibility of both a seismic event and a total loss of AC power occurring simultaneously is remote. Even if this combination were to occur, the auxiliary boiler building would have to fail in a manner which would result in the nearly perfect sealing of the entire flow area of the exhaust line before the turbine driven pump would fail to deliver the required flow.

To summarize the design provisions of the AFW system, the system design meets all current requirements and will function for events beyond current design bases established by the NRC.

2. Compliance With The FSAR

The design of the AFP turbine exhaust pipe is in accordance with the original design intent and the FSAR requirements. The declassification of the exhaust line to non seismic and B31.1 was shown in the PSAR and the FSAR. The design of the AFW pump and turbine meet the FSAR requirements stated in Section 3.9(B).3.2.2.1: the pump is designed and qualified to operate during a safe shutdown earthquake. This section makes no commitment for the design of the exhaust line nor does it address the exhaust line.

The regulatory requirements for the seismic design of systems are addressed in Regulatory Guide 1.29. The SNUPPS response to this regulatory guide is provided in Table 3.2-3. As noted therein, the SNUPPS implementation of seismic requirements is shown on Table 3.2-1. The text of Section 3.2 states the following:

> "For identification of system and subsystem boundaries, Table 3.2-1 is supplemented (i.e., referenced to applicable figures) by piping and instrument diagrams which have been marked to clearly show the limits of the seismic category I and the various quality group classifications on a system."

Section 5.4 of Table 3.2-1 describes the AFW system pumps and provides a reference to Figure 10.4-9. Figure 10.4-9 clearly indicates the limits of the seismic Category I piping. Section 10.4.9 also references this table for the definition of seismic design limits.

In summary, it is SNUPPS position that there is no violation of FSAR commitments.

3. Content of the FSAR

This finding implies that the SNUPPS FSAR did not fully describe the design of the exhaust line. We believe that the FSAR content is appropriate.

The SNUPPS FSAR is written in accordance with Regulatory Guide 1.70. This regulatory guide and the Standard Review Plans (SRPS) do not require descriptions of design provisions which have not been provided nor do they require justification for not providing certain features. The SNUPPS FSAR does clearly identify the design of the exhaust line and references the specific location in which the exhaust line provisions can be reviewed.