Consumers Power Company

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MIDLAND PROJECT
MIDLAND DOCKET NOS 50-329, 50-330
CHAPTER 7 and 8 INFORMATION
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Additional information has been requested by NRC Staff reviewers in recent meetings concerning FSAR Section 7 and 8. The attachments to this letter provide documentation of verbal responses and are organized by FSAR chapter. This response should allow resolution of these issues.

R A Wells, Executive Manager

for: J W Cook

RAW/BLH/jvm

CC RJCook, Midland Resident Inspector
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CHAPTER 7 - NRC QUESTION 031.54 (IE Bulletin 79-21)

In response to NRC Question 031.54 for Midland 1 and 2, Consumers Power Company has conducted an analysis on the effects of high energy line break (HELB) environment on the level sensors inside containment used to initiate safety actions or to provide post-accident monitoring information. The results of the analysis indicate that the level sensors inside containment are affected to some degree by the HELB environment but the effects do not adversely affect the assumptions used in the plant safety analysis with the exception of the once-through system generator (OTSG) safety-grade water level sensors used by the auxiliary feedwater controls. These safety-grade OTSG water level sensors will incur errors that exceed present allowable setpoint bands due to the adverse HELB environment.

Additional analysis shows that insulation installed on the reference legs of these OTSG water level sensors is sufficient to reduce the total error of the auxiliary feedwater system to allow it to perform the necessary automatic functions with no actions required by the operator.

During a small break loss of coolant accident (SBLOCA), it is a procedural requirement for the Midland Plant that the operator manually raise the water level in the OTSG to a predetermined level. This manual level setpoint has a narrow setpoint band for the SBLOCA conditions. To manually control the level within the allowable setpoint band the operator will be required to make some minor adjustments to where he is controlling the level in the OTSG based on the temperature of the reference legs of the OTSG wide-range water level sensors (the operator will utilize a table of correction factors). Safety-grade temperature sensors will be installed to provide this indication. Our analysis has determine that no adjustments will be necessary for at least 15 minutes after a SBLOCA occurs

Therefore, the Midland design will be changed to include insulation on the reference legs of the OTSG safety-grade water level sensors. Safety-grade temperature sensors will also be provided on two different reference legs of the wide-range OTSG safety-grade water level sensors of each OTSG with indication in the control room.

CHAPTER 8 - LOAD SEQUENCERS

The Midland Plant sequencers are contained within the engineered safety features actuation system (ESFAS). Therefore the qualification testing program for the load sequence is the same as the ESFAS, and the ESFAS qualification testing programs is described below:

The qualification program used for the ESFAS includes normal and extreme operational testing, aging, and seismic testing. As identified in the ESFAS qualification procedure, the operational tests include the following:

1. Verification of proper system operations with simulated input (including all possible order of occurrences of emergency core cooling actuation signal (ECCAS) and loss-of-power events to the sequencers)

2. Verification of system accuracy and response time

3. Verification of system noise immunity

4. Performance of manual testing features

5. Performance of automatic testing features while including intentional faults

6. Verification of proper system operations during voltage fluctuations

7. Isolation testing consisting of high potential dielectric and insulation breakdown testing

8. Verification of system operation during a seismic event

In addition to the operational and functional testing performed on the ESFAS, reliability, availability and failure modes and effects analyses are also performed on the ESFAS subsystems and its components. The analysis was performed on the sequence of events of system operations, overall effect of failed devices or components to the system operations, incremental failure rates of system components, and reliability, availability predictions for overall system operation.

Results of this analysis show that the Midland sequencers meet all design requirements. No other tests are required and there should be no open issues involving the sequencers.

The Midland Plant sequencers are designed and manufactured by Automation Industries, Vitro Laboratories Division. This sequencer design concept is similar to that used in the sequencers' design of Comanche Peak, Summer, Enrico Fermi, Salem, Zimmer, Calvert Cliffs, Grand Gulf, and Seabrook nuclear facilities. The primary difference between each of these designs consists of the packaging and size of the final configuration.

The sequencers at the Summer Nuclear Plant have been subjected to a sneak circuit analysis. As stated in their report to the NRC, the sequencer was found to be free of sneak circuits, thereby no hardware modifications are necessary. Since the Midland sequencer is similar in design, it is reasonable to expect the same observations if it was subjected to a sneak circuit analysis. A discussion of a comparison of the Midland sequencers, specifically to the Summer Plant sequencers, follows:

The operation of either the Midland or Summer sequencer design is identical in the following areas. Both systems are initiated on an undervoltage condition and a diesel generator breaker closure for a loss-of-power (LOP) sequence or on a safety injection signal ECCAS for a loss-of-coolant accident (LOCA) sequence. Both systems utilize the same design philosophy; ie, given an initiation of a particular sequence and the existence of a second initiating condition (LOP followed by an ECCAS or ECCAS followed by an LOP), the initial sequence is reset and the second initiating sequence is started from Step 0.

The Summer load shedding logic is different from Midland in that it is included in the sequencer design. The Midland load shedding logic is accomplished external to the sequencer.

Testing provisions in both the Midland and Summer sequencer design include incorporation of both automatic and manual testing capabilities. Sequencer timing intervals are operator-selectable and verifiable in both system designs. The Summer design time intervals differ from the Midland design in that the Summer sequencer has a timing range of 0 to 99 seconds, selectable in 1-second increments, whereas the Midland sequencer has a timing range of 0 to 60 seconds, selectable in 1/2-second increments. Both systems' designs enable operation with or without the automatic testing features.

The logic design of the Midland sequencer is identical to that of the Summer sequencer. Manufacturing of the individual cards utilizes Vitro's standard cards and manufacturing practices (eg, wire wrapping and soldering).

The difference between the Summer sequencer and the Midland sequencer is at the component level of the cards. The Midland sequencer utilizes components of newer technology integrated circuits, whereas the Summer sequencer utilizes components made of standard transistor-integrated circuits and diodes. In addition, the Summer sequencer card racks are mounted in their own sequencer cabinets whereas the Midland sequencer card racks are mounted in the ESFAS cabinets.