MAY 0 6 1976

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THRU: Charles F. Miller, Section Leader, Electrical, Instrumentation and Control Systems Branch, Division of Systems Safety

SUMMARY OF MEETING WITH DAVIS BESSE UNIT 1 - DRAWING REVIEW OF AUXILIARY FEEDWATER, MAIN STEAM LINE ISOLATION AND FEEDWATER LINE RUPTURE CONTROL SYSTEM

A meeting was held in Bethesda, Maryland, April 14-15,1976, with NRC, Toledo Edison Company (Davis Besse Unit 1) and Bechtel (Gaithersburg) to review the final design drawings for the subject system. A list of attendees is enclosed.

The purpose of the meeting was to assure that the design has been adequately implemented to satisfy the requirements of the applicable standards and criteria. During the course of the meeting the applicant was requested to demonstrate how the design met the criteria for channel separation. Selected input parameters to the Auxiliary Feedwater System were traced from the sensor to the logic cabinets located in the control room and from the logic cabinets to the actuated equipment (i.e., valves, pumps, etc.). The applicant identified the location of wireways and sensor mountings between redundant channels in order to verify that safety related channels were adequately separated.

Enclosure 1 summarizes the items discussed and identifies the concerns expressed by the NRC staff.

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Enclosure:
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MEETING ATTENDEES

F. Eltawila	NRC*
V. W. Howard	Bechtel
D. W. Douds	Bechtel
D. V. Pichett	NRC
B. F. Novich	Bechtel
G. A. Stashik	Bechtel
E. J. Ray	Bechtel*
R. W. Jackson	Bechtel*
J. E. Reilly	Bechtel*
J. K. Wood	TECo
S. N. Saba	Bechtel*
C. F. Miller	NRC*
F. R. Miller	TECo
L. Engle	NRC*
A. Szukiewicz	NRC
M. Cantor	Bechtel*

*Part Time

ENCLOSURE 1

1. The overall Auxiliary Feedwater, Main Steam Line Isolation and Feedwater Line Rupture Control Systems were discussed in detail. (The applicant calls this system the Steam, Feedwater Line Rupture Control System - SFRCS). The staff indicated that the system, as presently designed, does not fully meet the requirement of IEEE Std 279-1971 and is not acceptable. Anticipatory inputs to the reactor protection system are derived from systems that are not Class IE (e.g., inputs from the Integrated Control System) and as such do not satisfy the Commission's requirements. The staff required that these input systems be designed to IEEE Std 279-1971 if they remain as reactor protection system inputs, or remove them if they are not required for safety. The applicant agreed to these requirements and committed to submit a modified design.

2. The staff identified valves HV106, HV106A, HV107 and HV107A (steam inlet valves to the auxiliary feedwater pump turbine) which incorporate an override interlock to shut these valves and inhibit the valves from opening) whenever the containment pressure exceeds 38.5 psia. It is the staff's concern that the interlock will negate the operation of the auxiliary feedwater system automatically and manually. The applicant was requested to verify that, for conditions when containment pressure reaches 38.5 psia, the auxiliary feedwater system would not be required. In addition, the applicant was requested to demonstrate that adequate margin is provided in the setpoints so that proper operation of the Auxiliary Feedwater System will not be negated when this system is required.

Containment Systems Branch agreed to evaluate the adequacy of these setpoint settings and advise EICSB as to their acceptability.

The applicant agreed to delete these interlocks from their design in the event the staff determined that the setpoint margin provided for these interlocks are inadequate.

3. Testability of the subject system was discussed. The applicant verified that provisions in the system allowed for periodic on-line testing of the system logic channels. Since the system incorporates "blind" sensor inputs, the staff questioned Davis Besse's capabilities to periodically verify the operability of these sensor The applicant stated that for all sensors located outside containment provisions will be available to facilitate periodic verification of sensor operability.

However, no apparant provisions were incorporated to allow for periodic verification of those blind sensors located inside containment. The staff indicated that Technical Specifications require that systems required for safety be periodically tested to verify their functional operability (this includes the systems as a whole, i.e., sensors, logic and actuated devices). The channel testing period defined is "not to exceed once every thirty days". For verification of "blind sensors", the Technical Specifications will require periodic verification of their operability once every three months. The method used to check the operabiity of all sensors will be review at a later date.

4. Discrepancies found in the final design drawings for these systems were discussed. The applicant committed to revise the drawings and include the necessary legends, cross references, clearly identify the parameters being actuated and monitored, and to modify the functional logics to represent the as-built design.(i.e., modify the design to conform with Item 1 of this report, correct the drawings for main steam isoaltion valve actuation to represent the as built design, etc.).

5. The actuated equipment associated with the subject system was reviewed. The staff identified various control schemes that interconnect redundant channels (i.e., channel 1 with channel 3, and channel 2 with channel 4). Based on the information presented, it was not apparent how adequate isolation was provided to assure that a single failure would not degrade the functional operability of channels. Bechtel committed to review this concern and resolve the staff's concerns.

6. For the subject systems, selected sensor cable routings were traced from the sensors field installed physical location through to the actuation logic cabinets to verify that the design has been implemented in accordance with the channel separation criteria as defined in the FSAR Channel 1 and Channel 3 are run independently in separate metal conduits for the major portion of each ones run, however, they both converge from opposite direction into a common tray (labled 1CPL). Since Channel 1 and Channel 3 are associated with train I and Channel 2 and Channel 4 are associated with train II and there was commonality

identified between redundant trains, the staff concluded that the commonality identified above is acceptable for this system. However, the staff cautioned that such commonality could effect other systems such as the RPS and ESFAS and degrade those systems below an acceptable level. We intend to review these other systems at a later date.

7. During the review the staff identified areas where redundant channel wiring routed in separate and independent metal conduits, were routed in close proximity to each other without provisions for barriers other than the conduit itself. Although the staff recognizes that metal conduits may be a valid barrier for certain types of failures, the staff does not consider that conduits alone are adequate barriers for all types of failures. The applicant was requested to review these installations. Where external sources (such as heat or missiles) may effect the redundant circuits in these conduits, the applicant was requested to provide barriers to assure the integrity of these circuits or justify their design on some other defined basis. Incidents such as a fire in an open tray crossing under redundant conduits was cited as an example that may effect the cables inside the conduit and degrade the system circuits below an acceptable level. The applicant committed to evaluate their criteria and will advise the staff as to the resolution of this concern.

8. The Auxiliary Feedwater Isolation valves circuitry was reviewed (HV608 and HV 599). We concluded that the circuitry for these valves did not fully meet the requirements of the staff's position as stated in

Question P7.1.1 (10/4/74) and was unacceptable. We requested that the applicant modify the design to conform with our requirements. (i.e., when the single failure criterion is satisfied by removal of electric power from these valves, these valves should have redundant position indication in the main control room and the position indication system should itself meet the single failure criterion). The applicant committed to modifiy their design to meet our requirements.