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THRU: Voss A. Moore, Chief, Instrumentation
& Power Technology Branch, DEL
D. F. Sullivan, Instrumentation & Power
Technology Branch, DEL

JERSEY CENTRAL-OYSTER CREEK INSTRUMENTATION REVIEW - DOCKET NO. 50-219
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On May 18, 1967, a meeting was held with representatives of Jersey Central, General Electric, and Burns and Roe to discuss detailed design features of the Oyster Creek instrumentation. Schematic diagrams of the Core Spray, Containment Spray, and Refueling Interlock systems were made available for review.

The following conclusions were drawn from the meeting:

- (a) A single failure in the Core Spray control system can nullify the entire system under accident conditions.
- (b) A single failure in the Refueling Interlock system can nullify its function. The refueling accident (assuming a failed interlock) has not been analyzed.
- (c) Additional meetings will be required to complete our review of the instrumentation schematics. The review can be completed only after the design of the on-site emergency power system becomes final.
- (d) Review of schematic diagrams is essential at the operating license stage.

The Core Spray system consists of two independent pumping trains, each of which contains redundant main pumps, redundant booster pumps, and redundant discharge valves. Since the limited electrical output of the diesel generator allows operation of only one main and one booster pump (assuming a loss of off-site power), the Core Spray system is designed such that one train and one set of pumps within the train are designated as "preferred" pumps under accident conditions. If starting is not achieved (as sensed by pressure switches at the discharge headers of the pumps) the sequencer selects the next pump (or pumps) in the program until successful operation is accomplished. Core Spray flow actually occurs when the discharge valves are permitted to open by instrumentation which senses reactor low pressure.

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Our review indicated that a single failure within the reactor low-pressure instrumentation can disable the entire Core Spray system. Briefly, there are two sensors, each of which conditions the operation of the discharge valves in one train. Thus, if the pressure switch in the "preferred" train fails in the unsafe mode, the discharge valves would not open. (Under these conditions there is no provision for automatic transfer to the other train.) This is a violation of General Electric's own criterion which was originally stated in their "draft of the description and evaluation of Dresden Unit 3 emergency core cooling provisions" (dated July 26, 1966). Paragraph No. 2 of Section II.2.2.1 reads, in part, ". . . the permissive signal to open the valves is initiated by two pressure switches in each system connected in parallel so that a low pressure indication from either switch will actuate the valves."

If off-site power is not lost under accident conditions, both Core Spray trains are started. It is therefore essential that the instrumentation which senses loss of off-site power be extremely reliable; otherwise the diesel generator would stall, or be tripped out by the resulting overload. The schematic drawings contained no provisions to sense off-site power loss and block simultaneous actuation of both trains.

The applicant's representatives were not prepared to discuss the Containment Spray system schematics.

The schematic of the Refueling Interlock system was reviewed. With the mode switch in the "Refuel" position, a failure of the rod-block relay will allow a loaded hoist (or hoists) to be positioned above the core with any number of rods fully or partially withdrawn. It has been our understanding that the Refueling Interlock system would meet the single failure criterion, and our position has been clearly stated during the Browns Ferry and Vermont Yankee reviews.

As implied in the preceding paragraph, the Rod-Block system does not meet the single failure criterion. The applicant has submitted no analysis to justify this design.

It has become apparent that several more meetings will be required in order to complete our review of the instrumentation schematics and associated circuits. The review, however, can be completed only after the design of the on-site emergency power becomes final.

It has also become apparent that a staff review of schematic diagrams is essential at the operating license stage.

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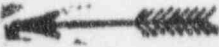
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Present at this meeting were:

- D. Hetrick, Jersey Central
- M. Lane, General Electric
- E. Hobbie, Burns and Roe
- F. Hubel, GSEL
- V. Moore, DRL
- D. Sullivan, DRL

- cc: F. A. Morris, DRL
 S. Levine, DRL
 R. Todeseo, DRL
 V. Stalle, DRL
 V. Moore, DRL
 D. Sullivan, DRL

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