GPU Nuclear

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August 31, 1982

Mr. Dennis M. Crutchfield, Chief
Operating Reactors Branch #5
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Crutchfield:

Subject: Oyster Creek Nuclear Generating Station
Docket No. 50-219
Transient of July 17, 1980

The attached report, TDR-239, is our analysis of the transient events that occurred at Oyster Creek on July 17, 1980. The most notable elements of the report are:

1) That two triple-low level sensor trips occurred during this event.
2) The triple-low level sensors are delta-P sensors and a variety of parameters are measured in combination by these sensors.

In order to avoid confusion, it will be convenient at the outset to define what is meant by a triple-low level. This level is the two phase mixture level above the top of the active fuel (TAF) that corresponds to 4'8" and is a safety limit for the Oyster Creek plant. The transient data available and all other supporting evidence supports the fact that this condition never existed during the course of the July 17, 1980 transient. The "level" sensed by the triple-low switches causing them to trip was that of a much less severe situation. In this case a level signal will represent either a static, collapsed (single phase level of water 4'8" TAF, or an equivalent combination of pressure differences produced by both steam separator flow and elevation heads. As shown in TDR-239, it was triple-low level signals of this latter type that were present during the July 17 event.

The first triple-low level trip signal event is postulated to have occurred during the time when the Electromatic Relief Valve (EMRV) lifted due to the pressure increase in the vessel caused by the inoperability of the Turbine Pressure Regulators (EPR/MPR). As would be expected with a triple-low level condition, the Reactor Building Closed Cooling Water (RBCCW) line to the drywell was isolated. It is believed that the sensors did not pick up the event recorder or the annunciators, because they came "in" and "out" faster

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than the logic could register. In the second event which occurred after the bypass valves were opened, all four triple-low switches tripped and were picked up by the event recorder. However, the front control board alarm did not annunciate. Additionally, there was no RBCCW isolation. Again, as is noted in TDR-239, the triple-low level signals obtained during the event were indicative of a set of pressure head differences equivalent to a single phase water height of 4'8" TAF. This caused the switches to trip. At that point in time, a very high mixture level was actually present over the core. It was when the core flow from the recirculation pumps was reduced momentarily, that the flow delta-P decreased, and the triple-low trip signals were initiated.

Some additional considerations that support the conclusion that the reactor was in safe condition throughout the July 17 transient are:

1. During the entire transient period, feedwater flow to the reactor vessel was present.

2. The reduction in flow between the core area and the annulus (downcomer) area existed only for a short period of time, and was never totally lost, since a flow path was always open through the recirculation lines. Note that at the time of the triple-low signal a reduced flow was present in all five of the recirculation lines; however, no indication of a zero flow condition was received. The time period for this event should not be confused with the period after the reactor scram when the recirculation flow indicator went to zero (downscale).

3. The triple low trip signals occurred only for a very short period of time indicating that the equivalent level could not have dropped much below the setpoint, and so was still well above the top of the fuel.

4. The events of the transient and the reasons have been discussed and confirmed in conversations with the General Electric Company and GPUNC in-house technical support personnel.

Since your March 26, 1981 letter, there has been another depressurization event that has resulted in a large reduction in recirculation flow. As discussed with your staff by telephone on April 29, 1982, this event did result in indicated recirculation flows dropping to approximately the values seen in the July 17, 1980 transient; however, during the March 1981 transient there were no triple low signals sensed. While the March 1981 transient did involve a rapid depressurization it did not involve a rapid cessation of steam flow from the reactor as did the July 17, 1980 event. This disparity between the transients seems to indicate that the rapid cessation of steam flow may have contributed to the triple low water level signals received during the July 17, 1980 event.

Finally, please be aware that the conclusions drawn in the TDR are based on the considered examination of all available information pertinent to the event. It is unfortunate that more information was not available which would have allowed a clearer and more precise understanding of what took place during the event and the reasons involved. Since this was not the case, however, absolute confidence in the conclusions presented is not possible. Attachment 2 addresses those questions asked in your March 26, 1981 letter which are not addressed in TDR No. 239. For the purpose of clarity, we have restated

your question as well as our response in Attachment 2.

If you should have any further questions, please direct them to Mr. J. Knubel, (201) 299-2264.

Very truly yours,

F. B. Fiedler
Vice President and
Director-Oyster Creek

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cc: Ronald C. Haynes, Administrator
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