

May 9, 1979

M. Plesset, Chairman
Oyster Creek Subcommittee

OYSTER CREEK TRANSIENT RESULTING IN LOW CORE WATER LEVEL

Below and attached is a compendium of the information available to me, at present, concerning the May 2, 1979 transient at Oyster Creek that resulted in a low water level (4 ft. 8 in. above the core) in the reactor.

Oyster Creek is an early non-jet pump BWR with five recirculation loops, designated A through E (Attachment I). The reactor design precludes feedwater from communicating directly with the core; the water must be pumped through the recirculation loops into the bottom of the reactor vessel (Attachments II and III). With this design, it is possible for the annulus surrounding the core to be full of water while the core is deficient of water.

About 1:51 p.m. on May 2, during routine testing, a false signal to plant instrumentation resulted in a reactor scram and tripping of all recirculation pumps. The plant was operating near full power (1930 MW(t)) with 4 of the 5 recirculation loops in service.

Upon trip of the plant generator, power to the B and D 4160 volt busses was lost resulting in loss of two of three feedwater pumps. The third pump failed to start, and all feedwater was lost. A low-water level alarm was sounded, 13.6 seconds into the transient, however engineered safety features (e.g. core spray) are activated on a low-low level signal, which was never received. (A low water level signal only causes a scram - Attachment IV.)

Below is a listing of the event sequence of the transient from 10 seconds after initiation of the event.

- 10 sec - Turbine trip and loss of B and D 4160V bus resulting in loss of 2 of 3 feedwater pumps
- 13.6 sec - Reactor low water level signal
- 25 sec - Diesel generator #2 starts and energizes 4150V D bus
- 40 sec - Operator turns on 2 control rod drive pumps to put water into reactor (low flow pumps)

Oyster Creek

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- 42.8 sec - MSIV's closed
- 72 sec - Begin steaming to A isolation condenser (see Attachment V). Valves to condenser cycled opened and closed by operator to maintain reactor pressure.
- 85 sec - Discharge valves on loops A and E closed (A&E loops served by isolation condenser) Bypass valves were open.* Operator also closed B and C recirculation loop discharge valves⁺. These discharge valves are closed to reset for pump operation.
- 90 sec - Water level went above low-level alarm setpoint (believe due to swell from isolation condenser).
- 172 sec - Triple-low level alarm received (water 4 ft. 8 in. above core)
- 600 sec - Personnel sent to reactor area to verify triple-low level signal - signal verified as real
- 1932 sec - Started recirculation loop pump C - rapid decrease in vessel annulus water level seen - operator tripped pump at 2022 sec.
- 2190 sec - A-loop feed pump started
- 2340 sec - Recirculation loop-A pump started. The triple-low level signal cleared sometime between 1932 and 2340 seconds.

This is the extent of my information to date. Attachment VI is a copy of the Reportable Occurrence Report, dated May 3, that details the information discussed above. The NRC will discuss this incident at the 229th meeting on Thursday May 10 at 10 a.m. I will provide additional information as it is received.

Paul Boehnert
Reactor Engineer

*I was told all bypass valves on all loops were open during the entire transient. It appears that flow through the bypass valves is insufficient to maintain core water level.

⁺There appears to be some controversy on this point.

Attachment: as stated

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SURNAME		ACRS Technical Staff				
DATE		C. Michelson				