8/23/82

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	Docket No. 50-155-OLA
CONSUMERS POWER COMPANY	)	(Spent Fuel Pool
	)	Modification)
(Big Rock Point Nuclear Power Plant)	)	

CONSUMERS POWER COMPANY'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW ON CERTAIN ADMITTED ISSUES WITH RESPECT TO CHRISTA-MARIA CONTENTION 8 AND O'NEILL CONTENTION III E-2 (THE "TMI-2 CONTENTION")

I. FINDINGS OF FACT

A. Contention

1. In its February 19, 1982, Memorandum and Order (Concerning Motions for Summary Disposition), the Atomic Safety and Licensing Board (the "Licensing Board"), *inter alia*, admitted the following genuine issues of fact with respect to Consolidated Contention Christa-Maria 8 and O'Neill III E-2:

> (1) How reliable is the remotely activated makeup water system which will be added to the spent fuel pool. How reliable does it need to be? How many gallons per minute will it be able to makeup?
>
> (2) How reliable are the spent fuel pool

water level monitors which applicant is planning to install? Is applicant required to install and maintain these monitors?

(3) Are motor operated valves MO-7064 and 7068 necessary to control containment pressurization? Are they qualified for high temperature and high humidity?

B. Issue (1) - Capability and Reliability of Makeup Water System

2. Consumers Power Company ("Licensee") has installed a remotely activated fuel pool makeup line that would automatically supply water to the spent fuel pool to compensate for any loss of water due to pool boiling.[1/]

3. Mr. David Blanchard, a Technical Engineer at the Big Rock Point Plant, testified how the remotely activated fuel pool makeup line would operate; including its capability and reliability.[2/]

(i) Capability

4. Assuming that the spent fuel pool is filled to capacity with the most recently discharged fuel bundles having been removed from the reactor for one month, the

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1/ "Further Testimony of David P. Blanchard on Christa-Maria Contention 8 and O'Neill Contention III E-2" hereinafter "Blanchard Testimony", following Tr. 2024, p. 2.

2/ Blanchard Testimony, pp. 2-20.

decay heat generation would be such that the pool would begin to boil after 144 hours. The boil-off rate would be approximately one gallon per minute. At that rate, the fuel in the pool would become uncovered in nearly 1400 hours.[3/]

5. Analyses performed by the NRC Staff and Mr. Blanchard indicate that maximum boil-off, assuming the pool is filled to capacity including a full core discharge two days after the last reactor shutdown, would be no more than nine gallons per minute. A loss-of-coolant-accident ("LOCA") cannot occur during a reactor shutdown while the full core is in the pool.[4/]

6. An analysis performed by Licensee shows that the makeup system is capable of supplying a minimum 13 gallons per minute to the spent fuel pool under circumstances of a worst single failure.[5/]

(ii) Reliability

7. There are only two active components in the core spray recirculation system, either of which must activate in order for water to be added to the fuel pool through the makeup line. These are the two core spray recirculation pumps. Each pump alone has the ability to provide sufficient

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3/ Blanchard Testimony, p. 15.

4/ Id., pp. 15-16.

5/ Id., pp. 16-20.

flow to the core spray system to cool the core and to the fuel pool to cool the spent fuel.[6/]

8. The pumps are located outside the containment building and would therefore not be required to operate in a LOCA environment.[7/]

9. Power for each pump is supplied from a separate AC bus in the station power system. Should the normal off-site power source be lost, either bus can be transferred to the emergency bus which receives its power from either of two redundant diesel generators.[8/]

10. The passive components of the remotely activated makeup water system are those components which merely provide a path for the core spray pumps to draw water from the containment and send it to the pool and core spray systems. The passive components include the suction and discharge of the pumps, the core spray heat exchanger, and the makeup line or piping and valve to the fuel pool.[9/]

11. The majority of the passive components in the fuel pool makeup system are located outside of the containment where there are no lines containing high energy primary coolant. In that location, these components would not be vulnerable to pipe whip or steam impingement or to the

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6/ Blanchard Testimony, p. 5.

7/ Id., p. 5.

8/ Id., p. 5.

9/ Id., p. 6.

hostile environmental conditions inside containment following a LOCA.[10/]

12. The makeup water system line to the pool inside the containment building is routed such that it does not pass in proximity to the primary coolant system piping.[11/]

13. The passive components are located such that the drop of a cask or other heavy objects cannot simultaneously damage primary coolant system lines and components required for makeup to the fuel pool.[12/]

14. Hand-operated valves located on the core spray recirculation and fuel pool makeup lines could prevent flow to the systems if mispositioned. To insure the valves are set in their correct positions prior to returning the plant to operation, Licensee employs vigorous surveillance and administrative procedures governing operator actions.[13/]

15. One surveillance test is performed while the plant is at power which temporarily removes the core spray heat exchanger from service. During the period of time the heat exchanger is isolated for this test, the pumps of the core spray recirculation system will be unable to pump water throught the heat exchanger; and hence, no water can flow

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10/ Blanchard Testimony, p. 6.

11/ Id., p. 6.

12/ Id., p. 7.

13/ Id., pp. 7-8.

through the makeup water system. Upon completion of the test, the heat exchanger is returned to service in accordance with extensive step-by-step operating procedures.[14/]

16. The heat exchanger surveillance test occurs monthly and isolates the heat exchanger for no more than four hours, and thus is extremely unlikely to coincide with a LOCA.[15/]

17. Availability of an adequate water source for the core spray recirculation system and thus the fuel pool makeup water system is assured by the overwhelming capacity of the fire protection pumps to supply the required flow to the containment building.[16/]

18. Licensee has designed additional diversity into the fuel pool makeup water system by providing the operator the option of adding water from the fire pumps to the pool through the makeup line. This option can be used if there is a simultaneous failure of both core spray pumps or if the heat exchanger has not been realigned for service. Further, the fire pumps can provide a source of water for the makeup line in a non-LOCA situation since it does not rely on recirculation of water in the containment.[17/]

19. The analysis performed by Licensee also showed that the spent fuel pool water makeup system would not draw water away from the core spray recirculation system such

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14/ Blanchard Testimony, p. 9-10.

15/ *Id.*, pp. 9-10.

16/ *Id.*, p. 11.

17/ *Id.*, pp. 11-12.

that it would reduce the effectiveness of that system. The fuel pool makeup system was designed such that even under a worst single active component failure, the core spray system would be assured an adequate flow to fulfill its function and meet the design requirements established by 10 C.F.R. Part 50, Appendix K.[18/]

C. Issue (2)-Reliability of Spent Fuel Pool Water Level Monitor

20. By letters dated January 16, 1980 and May 15, 1980, Licensee committed itself to the installation of a pool monitor qualified for a LOCA environment with readout in the control room.[19/]

21. The pool level monitor is a Rosemount differential pressure transmitter. Power for the monitor is supplied from an instrument panel normally supplied by off-site power through the station power system. If off-site power is lost, the power source for the panel is automatically transferred to the emergency bus powered by the diesel generator.[20/]

22. The instrument is qualified for LOCA conditions as required by IEEE-323-1971. The radiation dose rates for which the transmitter is qualified are those determined for

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18/ Blanchard Testimony, p. 17-20; Tr. 2163.

19/ Id., p. 21.

20/ Id., p. 23.

a 100% core damage situation in accordance with NUREG-0737 and Regulatory Guide 1.3. The instrument is qualified as seismic Class I in accordance with IEEE-344-1975.[21/]

23. The pool level monitor provides additonal operation information in the control room which assures satisfactory operation of the spent fuel pool system.[22/]

D. Issue (3) - Motor Operated Valves MO-7064 and 7068

24. Motor operated valves MO-7064 and MO-7068 control containment spray which, among other things, controls containment temperature.[23/]

25. Neither the containment sprays nor motor operated valves MO-7064 and MO-7068 are necessary to control containment pressurization. The containment is designed to withstand a pressure of 27 psig. No postulated LOCA can result in a containment pressure this high. Additional pressure from pool boiling cannot occur until well after containment pressure reduces to near ambient.[24/]

26. Licensee submitted documentation on March 15, 1981, in accordance with NUREG-0588, specifying the reliability of

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21/ Blanchard Testimony, p. 23.

22/ *Id.*, p. 24.

23/ *Id.*, pp. 24-25; Tr. 2015.

24/ *Id.*, p. 24, 25-26, and Attachment 1.

motor operated valves MO-7064 and 7068 under circumstances of a worst case LOCA.[25/] The NRC Staff reviewed this documentation and determined interim operation of the Big Rock Point to be justified.[26/] Interim qualification originally extended only to June 30, 1982 by a 1980 order of the Commission.[27/] That deadline was recently suspended by Commission action since the NRC rulemaking is still pending which would codify environmental qualification requirements.[28/]

II. CONCLUSIONS OF LAW

1. The makeup water system is capable of supplying sufficient water to the spent fuel pool to compensate for loss of water due to pool boiling (Findings 4-6).

2. The single failure criterion set forth in Appendix A to 10 C.F.R. Part 50 may be used as a guide to measure the reliability of the makeup water system.

3. Sufficient redundancy exists with respect to active components of the makeup water system to assure the reliability of the system even assuming failure to one such component (Findings 7-9).

4. The makeup water system meets the single failure

25/ Blanchard Testimony, p. 26 and Attachment 2.

26/ Id., pp. 26-27, and Attachment 3.

27/ Petition for Emergency and Remedial Action, CLI-80-21, 11 NRC 707, 714-715 (1980).

28/ 47 Fed. Reg. 28363 (June 30, 1982).

criterion insofar as that criterion addresses active components.

5. Sufficient reliability exists with respect to the passive components of the makeup water system based on the engineered location of the components (Findings 10-13), and administrative controls and operating procedures (Findings 15-16).

6. Sufficient administrative controls and operating procedures exist to assure that certain valves on the core spray recirculation and makeup water system lines do not interfere with their intended safety function (Finding 14).

7. The makeup water system is sufficiently reliable to provide reasonable assurance that it will perform its intended safety function.

8. The fuel pool monitor is reliable as measured by the applicable crieria of IEEE-323-1971, NUREG-0737, Regulatory Guide 1.3 and IEEE-344-1975.

9. Motor operated valves MO-7064 and MO-7068 are qualified on the interim basis permitted by the NRC for conditions of high temperature and high humidity. These valves are not necessary for the control of containment pressurization.