

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

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

CHRISTA-MARIA CONTENTION 8 AND O'NEILL
CONTENTION III-2
(Subparts 1, 2, and 3)

INTERVENORS PROPOSED FINDINGS OF FACT

The contention, as originally phrased by Intervenor,
postulates that:

"The occurrence of an accident similar to TMI-2 which would prevent ingress to the containment building for an extended period of time would render it impossible to maintain the expanded spent fuel pool in a safe condition and would result in a significantly greater risk to the public health and safety than would be the case if the increased storage were not allowed."

In reference to this contention, the Board proposed five questions relating to the reliability of certain systems and components during a TMI-2 type accident. Of these five questions, three were addressed at the hearing in June of this year. Intervenor will make findings of fact on each question.

QUESTION I

The first question relates to the reliability of licensee's water system:

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 make up?

Generally, in a TMI-2 type accident, a Loss of Cooling Accident (LOCA) is postulated. A LOCA assumes that, at some point, additional water will need to be added to the spent-fuel pool due to loss of the pool's cooling system and subsequent heat-up and boil-off of pool water. Makeup water is necessary to replace the water lost due to boiling and to therefore prevent damage (i.e. melting) to the pool's spent fuel rod inventory.

Licensee's former "makeup" systems could not provide makeup water to the pool in the event an accident rendering containment uninhabitable because those systems required entry into containment to open hand-operated valves. Hence, makeup could not have been provided before fuel uncovering occurred.

In an attempt to alleviate this dangerous condition, Licensee has added what they term "a remotely activated" makeup line, a passive line which branches from the Emergency Core Cooling System (ECCS). Basically, this new line adds make-up to the pool from the fire protection system, after the occurrence of several events. (See Summary Deposition Testimony of David Blanchard, p. 9). First (assuming a LOCA), the core sprays inject cooling water to the reactor vessel. The path through which this injection occurs is through yard piping and valves from activation of the fire pumps.

As water is continually injected to the vessel through the core sprays, the water level is postulated to rise. When a significantly high containment water level is achieved, water is drawn from the bottom of containment and recirculated by pumping

the water through the core spray heat exchanger and then flows back to the containment vessel. (See Blanchard Testimony, supra, p.10) During this recirculation phase, water makeup to the pool will begin through the new makeup line which branches off the post-incident system,(Blanchard, supra, p.10).

This new makeup system is deficient and unreliable for several reasons.

First, the functioning of the make-up line is contingent upon too many "other systems". The first phase of eventually adding makeup water to the spent fuel pool is to obtain water from the fire protection system. This water passes through the system's yard piping and valves before reaching the emergency core cooling system loop. (T. 2166,2171) Yard piping is not considered to be safety-grade equipment nor was it designed to be an engineered safety system. This fire protection system piping consists of the same pipes installed when the plant was first built. (T. 2168) Because this in-ground piping has not been observed since its installation, and because it is made of standard commercial use material, the condition of this piping is suspect and in fact cannot be known without digging it up. Because these pipes are not safety-grade and could potentially freeze, break, or crack, the use of the fire protection yard piping and valves, as necessary to the functioning of the makeup water line, is not adequate.

Also, the fire protection system is driven by the emergency diesel generator and the diesel driven fire pump. Both of these

pumps utilize battery systems. The control room at Big Rock Point is not equipped to indicate battery output current, either for the electrical pumps or the diesel pumps. (See Systematic Evaluation Program Topic VIII-3.B) Besides the fact that Big Rock power systems are not currently in compliance relative to the above shown SEP topic, under accident conditions, a control room operator would not know whether or not the fire protection system had been activated. In short, the fire protection system is neither reliable or sufficient as the source to provide water which would eventually be used as makeup water through the new makeup line. When looking at the system as a whole, the makeup line is unreliable due to its dependency on the fire protection system.

Second, the Emergency Core Cooling System (ECCS), through the recirculation mode, is responsible for funneling water to the new makeup line to provide makeup water to the spent fuel pool. Subject to several conditions, C.P.C. was granted a lifetime exemption from meeting ECCS single failure criteria by the Nuclear Regulatory Commission on May 26, 1976. Maybe because of this lifetime exemption, only certain components (valves, pumps) associated with the core spray system are periodically tested. The operability of the system as a whole is not subjected to a system intergrated test, as would be required by N.R.C. regulations. (See 10 C.F.R. Part 50, Appendix A, Criterion 37 - "Testing of emergency core cooling system", and S.E.P. Topic VI-7-A3, dated Feb. 22, 1982). The makeup line is directly connected

to the ECCS and is dependent upon the ability of the ECCS to work as a functional whole, which has not been shown because of the inability to test the entire system.

Notwithstanding that the ECCS at Big Rock Point was not designed against the single failure criteria and in fact received a lifetime exemption from meeting those criteria, the makeup line itself does not meet the N.R.C.'s single failure criteria for fluid systems. A definition of a "single failure" is provided in 10 C.F.R. Part 50, Appendix A:

"Single Failure. A single failure means an occurrence which results in the loss of capability of a component to perform its intended safety functions. Multiple failures resulting from a single occurrence are considered to be a single failure. Fluid and electrical systems are considered designed against an assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly), nor (2) a single failure of any passive component (assuming active components function properly), results in a loss of the system to perform its safety functions."

When analyzing the makeup system against these standards, one can examine (1) the makeup line itself, (2) the makeup line as it functionally depends on the ECCS, and (3) the makeup line as it functionally depends on the fire protection system.

Because the ECCS at Big Rock Point has received a lifetime exemption from meeting NRC single failure criteria, it would be futile to analyze the makeup line as it depends on the ECCS in the recirculation mode. It is a closed question. Intervenors must assume that the ECCS does not currently meet NRC single failure criteria, and since the makeup line branches from the ECCS loop and depends upon the water generated through that loop, one would have to assume that the makeup line is not single failure proof.

Second, the makeup line itself has no active components. It is completely dependent upon the active components of the ECCS and the fire protection system. The makeup line itself provides makeup to the spent fuel pool through a single valve- VPI-18. This valve is hand operated. A failure of this valve to remain open during accident conditions would render the makeup line useless. This, of course, assumes a TMI-2 type accident where the spent fuel pool cooling system, the radwaste system and the demineralized water system would not be available (they are all dependent upon in-containment operation). Also, a failure of this valve during accident conditions could not be remedied because the line is located inside containment, precluding manual operation.

Also, the line itself has not been seismically qualified by the NRC. This is particularly puzzling with respect to NRC design criteria. Although Licensee can plead that many of Big Rock's deficiencies are justified because Appendix A "was promulgated after Big Rock was built and licensed (See Blanchard's Additional Testimony, p. 12)", this does not hold water with respect to the new makeup line. Under 10 C.F.R. Part 50, Appendix A "Overall requirements", Criterion 2 states:

"Structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes, . . . without loss of capability to perform their safety functions."

This criterion also states that the design basis shall reflect-

"(1) Appropriate consideration for the most severe of the natural phenomena that have been historically reported, . . . (2) appropriate combinations of the effects of normal and accident conditions with the effects of natural phenomena, and (3) the importance of the safety functions to be performed." (Emphasis added)

The new makeup line has not been seismically qualified by the NRC staff and does not meet the design basis requirements of Criterion 2 of Appendix A. Licensee has not considered the effects of an earthquake on the makeup line and whether it could perform its intended safety functions during such an event. Neither does the design of the makeup line reflect analysis measuring the effects of normal operation in combination with the effects of natural phenomena. Nor does the design of the makeup line contemplate the ability of the line to withstand the effects of accident conditions combined with those of an earthquake. The makeup line is important to safety and the failure of Licensee and Staff to seismically qualify the line according to NRC regulation can only mean that the line has not been designed to meet its important safety functions as defined in Appendix A, Criterion 2. Also, as a result, the makeup line would not meet the definition of being designed against the single failure of a passive system, as noted above.

Lastly, the new makeup line does not meet single failure criteria as it relates to the fire protection system. As discussed above, a failure of the yard-piping would mitigate the use of the new makeup line (and also the ECCS). Likewise, the failure of valve MO-7072 would necessitate the failure of the makeup line. All passive components of the fire protection system associated with the pump discharge, the yard piping, and the piping up to MO-7072 rely on the proper functioning of Mo-7072. The makeup line also depends on the water flow coming through that valve, either as it initially is pumped to the ECCS which is later used for recirculation or as a back-up to the ECCS in case of failure. A single failure of

valve MO-7072 would result in the loss the makeup system's ability to perform its safety function. This could be true either before or after the recirculation mode of the post-incident system was placed into service. Hence, the makeup line does not survive NRC single failure criteria as it relates to the fire protection system.

In conclusion, Intervenors submit that the new makeup line as proposed by Licensee to makeup water to the spent fuel pool in case of a LOCA is not reliable, not qualified, and not adequate as a system intended to perform important safety functions. Its absolute dependence on the fire protection system and the ECCS reveals the lack of flexibility and usefulness in its design. Because it shares functions with so many other systems, a failure of any one of a number of components would lead to the failure of the makeup line. Because it is practically only a "drip-line", located entirely within containment, it really performs no independent function. This makeup line does not comport ^{with} NRC single failure criteria and does not comply with Criterion 2 under Appendix A overall requirements.

QUESTION II

The second question addressed by the Board reads:

"How reliable are the spent fuel pool water level monitors which the applicant is planning to install? Is applicant required to install and maintain these monitors?"

Prior to the planned installation of the Rosemount pool level monitor, the ability to determine the spent fuel pool water

level was negligible. Water level monitoring was by "visual observation". Thus, following a LOCA in which containment would be uninhabitable, spent fuel pool water level would be unknown.

Consumers Power Company's commitment to install pool level instrumentation with read-out in the control room graded in feet of pool water is not challenged by Intervenors. Because pool level indication would be available to the operator when either on-site or off-site power is available, and because the instrument is qualified for LOCA conditions, for high radiation doses, and is seismically qualified, Intervenors do not take issue with the monitor itself. Anything that Licensee does which will make Big Rock Point a safer plant will be fully encouraged by Intervenors.

The only problem with this monitor would be one of redundancy. A failure of this monitor would lead back to the impractical method of "visual observation". A second monitor, located in another area of the pool, capable of providing read-out in feet of pool water would greatly enhance the safety of the post-incident system and provide redundancy.

QUESTION III

The third question posed by the Board addresses the functioning of motor-operated valves MO-7064 and MO-7068:

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

Valves MO-7064 and MO-7068 control the containment spray system. The containment sprays are necessary to condensate steam

and reduce containment pressure following a LOCA. The containment sprays are also necessary to keep the containment temperature below 235°F. (See Blanchard's Additional Testimony, p. 25) Notwithstanding that these two valves have been justified for operation on an interim basis, the NRC staff has not fully qualified these valves for high temperature and high humidity. (See Petition for Emergency and Remedial Action, CLI-80-21, 11 NRC 707, 714-715 (1980) and Blanchard's Additional Testimony, note at p. 26)

In fact, in Licensee's attachment to Blanchard's Additional Testimony with respect to M)-7064, it is stated that, in a simulated test alleged to have occurred in 1970, radiation and thermal aging were not included as part of the test procedure. At any rate, the test did not include the valves currently installed at Big Rock. Also, the simulated test, along with the "Equipment Qualification Report" supplied in Attachment 2 to Blanchard's testimony, were performed in 1970 and have no actual relevance to the current condition of these valves.

In addition, Attachment 2 to Blanchard's Additional Testimony (the Attachment is dated 3/15/82), concerning MO-7068, states that "(r)adiation and thermal aging qualification testing has not been performed for this type actuator". Also, in this same report, Licensee expressly acknowledges that this equipment is "unqualified". (See Attachment 2, at p. 97a)

It is puzzling to Intervenor that information available to Licensee for over ten years was not submitted to the NRC staff for review until March 15, 1982, after the Board's order and before the hearing. It is also puzzling that in Licensee's submittal, although

it expressly states that the effects of thermal and radiation aging on these valves are unknown, the NRC nevertheless approved the Licensee's justification for operation on an interim basis on March 19, 1982. (See Attachment 3 to Blanchard's Additional Testimony) Based on the environmental qualifications submitted by Licensee, the NRC staff granted interim operation until June 30, 1982, conveniently after the scheduled end of the hearing.

In all probability, to meet guideline requirements, the actuator assembly will eventually be either replaced or rebuilt and qualified. (See Blanchard's Attachment 2, at p. 97) In this regard, the Staff's decision to continue to justify interim operation is questionable. Each delay allows these valves to remain unqualified, a potentially defective component in a necessary safety system.

That the NRC staff has continued to defer acting on the inadequate condition of these valves does not mean that these valves are qualified for high temperature and high humidity, as Mr. Blanchard proclaims. (See Blanchard's Additional Testimony, pps. 26-27) Mr. Blanchard asserts that "documentation available for this equipment did not meet all NRC Staff guidelines with respect to radiation and aging". (Testimony, p. 26-27) Then, Mr. Blanchard claims that Licensee provided justification and the NRC accepted it, implying that the NRC had determined that all Staff guidelines were met by Licensee's submittal of March 15, 1982. Yet, in that same submittal, which the NRC used to justify interim operation of the plant, it is plainly and clearly stated with respect to MO-7064 that "this component does not currently satisfy all the DOR guideline requirements." (See Attachment 2 to Blanchard's testimony

under "Conclusion")

Furthermore, following a LOCA, MO-7064 opens automatically. Approximately 15 minutes later, the operator is required to open MO-7063 to provide sufficient flow for iodine washdown. MO-7068 is also used as a back-up to MO-7064. However, in the event of an accident in which containment would be automatically sealed, and therefore uninhabitable, manual actuation of this valve would either be impossible or of high risk to plant personnel. Hence, redundancy to MO-7064 by MO-7068 in case of a failure of MO-7064 is based on the rather liberal assumption that an operator will be able to manually actuate MO-7068.

In conclusion, intervenors contend that MO-7064 and MO-7068 are not qualified for operation in a high temperature and high humidity environment. The effects of thermal and radiation ^{aging} on these valves is unknown. Thus, the radiation withstand capability of these motor-operated valves is unknown. The only available data relating to the qualification of these valves dates back to 1970 when the valves were installed. The condition of the valves do not currently meet all DOR guideline requirements. The NRC Staff justified interim operation of the plant based on a Licensee submittal summarizing twelve year old data, even though the submittal expressly stated that these valves did not meet DOR requirements

Intervenors respectfully request that the proposed findings of fact and related discussion regarding Christa-Maria Contention 8 and O'Neill Contention IIIIE-2 be affirmed and that the License amendment application be denied on that basis.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that on the ¹³ day of August, 1982, the foregoing Intervenors Proposed Finding of Fact was served on the attached list by mailing copies thereof by United States Mail, First Class, postage prepaid.

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