

BIER, MILLS, CHRISTA-MARIA ET AL.
P.O. BOX 222
CHARLEVOIX, MI 49720

DOCKETED
USNRC

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)

CONSUMERS POWER COMPANY)

Big Rock Point Nuclear
Power Plant)

Docket No. 50-155-OLA
(Spent Fuel Pool Modification)

Date: Sept. 25, 1983

TESTIMONY OF INTERVENORS CHRISTA-MARIA, BIER AND MILLS

Christa-Maria Contention 8 and O'Neill Contention III-2 "TMI-2"

Question I. 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?

I. A "WATER MAKE-UP LINE" is not acceptable as a substitute for a dedicated independant safety grade "COOLING SYSTEM". Consumers Power Company has modified and remodified the make-up water line but the line remains inadequate because it relies on several other systems and it was never designed originally to perform the function of cooling. This is of utmost significance² because the spent fuel pool must be kept below 150 F. because of concrete inadequacies.

II. The make-up water line branches from the Emergency Core Cooling System which has an exemption to the single failure criterion. Licensee claims to have designed additional diversity into the system by the option of opening MO-7072 and routing water to the pool directly from the fire pumps, but this could not be done in our TMI scenerio and is therefore not applicable to this contention. Parts of the ECCS do not meet the current criteria for tornado missile protection (see attachment #2). Also, only certain components 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 and S.E.P. Topic VI-7A3.)

III. The functioning of the make-up line is dependant on the fire protection system. This water passes through the system's yard piping and valves before reaching the emergency core cooling system loop. Yard piping consists of the same pipes installed when the plant was first built. 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. (See attachment #4. Summary of SEP Topic Differences) The safety evaluation report identified flood hazards and deviations from NRC criteria that could cause failure of the fire protection system and the ECCS. (See attachment #1) The SER also identified areas of the fire protection system, the ECCS, and the Spent Fuel Pool that could be vulnerable to Tornado Missiles. (See attachment #2) The fire pumps are also vulnerable to submergence by flooding. (See attachment #3)

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 is not equipped to indicate battery output current, either for the electrical pumps or the diesel pumps. (See SEP Topic VIII-3.B Attachment #8)

In the Idaho National Laboratory's Review of Big Rock Point Plant's Request for Deferral of TMI Action Plan Items Considered Nonessential, they point out that the fire protection/core spray is the only low pressure injection system for ECCS water. They suggest that Big Rock Point improve the reliability/availability of the inventory makeup systems. Intervenor's suggest that an independent dedicated safety grade cooling system could be constructed in conjunction with this essential improvement. (See attachment #9)

The Big Rock Spent Fuel Pool has no safety grade equipment available to cool the pool and access could be limited by a LOCA. Information regarding the composition of the concrete is sketchy, and the NRC has requested that the pool temperature be kept below 150 F. at all times. These special circumstances necessitate a COOLING SYSTEM which is independent, dedicated and safety grade. We cannot accept a modified and re-modified makeup system.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

November 16, 1982

Docket No. 50-155
LS05-82-11-049

Mr. David J. Vandewalle
Nuclear Licensing Administrator
Consumers Power Company
1945 W. Parnall Road
Jackson, Michigan 49201

Dear Mr. Vandewalle:

SUBJECT: SUMMARY OF SEP TOPIC DIFFERENCES
BIG ROCK POINT NUCLEAR POWER PLANT

Enclosure 1 is a listing of all of the SEP topics for which Big Rock Point does not meet the current licensing acceptance criteria. Enclosure 2 is a summary description of each topic difference, except for Topics III-2, "Wind and Tornado Loadings" and V-4, "Piping and Safe-End Integrity." The summary descriptions for these topics will soon be completed and issued. A full description of each of the differences may be found in the respective topic safety evaluation reports.

Some of the differences are based on draft safety evaluation reports. Therefore, the status of some of those topics and the summary of differences may be revised should you identify any factual errors that would affect the bases used by the staff to reach their conclusions.

Please provide in a written response your position with regard to the identified differences. This response should include any positions that are based on the results of your probabilistic risk assessment. In order to maintain the SEP schedule, your response is required by February 28, 1983.

Sincerely,

Dennis M. Crutchfield
Dennis M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

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SEP .

TOPIC NO.	TITLE
II-3.B	Flooding Potential and Protection Requirements
II-3.B.1	Capability of Operating Plants to Cope With Design Basis Flooding Conditions
II-3.C	Safety-Related Water Supply (Ultimate Heat Sink[UHS])

Current licensing criteria for nuclear power plants, related to these topics, were developed from the Code of Federal Regulations: 10 CFR Part 50, "Licensing of Production and Utilization Facilities," and General Design Criterion 2, 4, 5, and 44 of Appendix A, "General Design Criteria;" 10 CFR Part 100, "Reactor Site Criteria" and Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants."

The criteria which are applicable are (1) Standard Review Plans 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.4.5, 2.4.6, 2.4.7, 2.4.8, 2.4.9, 2.4.10, 2.4.11, 2.4.12, 2.4.14, 3.4.1, and 9.2.5 (Reference 1); (2) Regulatory Guides 1.27, 1.59, 1.70, 1.102, and 1.127 (Reference 2); and (3) American National Standards Institute (ANSI) Standard N170-1976 (Reference 3).

The safety evaluation report identifies potential flood hazards and deviations from current NRC criteria as listed below:

1. Under current criteria the Probable Maximum Meteorological Event (PMME) should be considered for determination of probable maximum flooding from Lake Michigan. On the basis of the analysis performed thus far, we can not conclude that the plant meets current criteria with respect to seiche induced flooding and storm induced surge and wave flooding.
2. We cannot conclude that the pump house, core spray room and turbine generator building are adequately protected from local flooding.
3. We cannot conclude that flood levels used originally in the design represent maximum subsurface hydrostatic loads or that the plant is adequately designed for subsurface loads in combination with other extreme environmental loads.
4. We cannot conclude that the plant will be able to withdraw emergency cooling water under conditions of probable maximum low water or probable maximum flooding.

SPENT FUEL POOL - Make up line
capability dependant
on Emergency Cooling
H₂O

Pump House

Core Spray Pm.

Turbine Generator Building

Advanced Plant Design

TOPIC NO.TITLE

III-4.A

Tornado Missiles

The plant design was reviewed with regard to General Design Criterion 2, "Design Bases for Protection Against Natural Phenomena" which requires that structures, systems and components essential to safety be designed to withstand the effects of natural phenomena such as tornadoes and General Design Criterion 4, "Environmental and Missile Design Bases" which requires that these same plant features be protected against missiles. The plant was also reviewed against the guidance contained in Regulatory Guide 1.13, "Spent Fuel Storage Facility Design Bases," 1.27, "Ultimate Heat Sink for Nuclear Power Plants," 1.117, "Tornado Design Classification," and 1.76, "Design Basis Tornado for Nuclear Power Plants" with regard to plant protection against tornado missiles.

As a result of the staff review, we conclude that the Big Rock Point plant does not meet the current criteria for tornado missile protection in the following areas:

1. Emergency condenser
2. Fire suppression water system
3. Control rod drive system
4. Station batteries
5. Emergency diesel generator
6. Power, control and instrumentation for the safe shutdown systems and other safety systems
7. Spent fuel pool
8. Reactor depressurization system
9. Post incident cooling system (enclosure spray); and
10. Liquid poison system

Does NOT meet current criteria

TOPIC NO.

TITLE

III-5.B

Pipe Break Outside Containment

General Design Criteria 4 (Appendix A to 10 CFR Part 50) requires in part that structures, systems and components important to safety be appropriately protected against dynamic effects, such as pipe whip and discharging fluids, that may result from equipment failures.

The current criteria for review of pipe breaks outside containment are contained in Standard Review Plan 3.6.1, "Postulated Piping Failures in Fluid Systems Outside of Containment," including its attached Branch Technical Position, Auxiliary Systems Branch 3-1 (BTP ASB 3-1) and Standard Review Plan 3.6.2, "Determination of Break Locations and Dynamic Effects Associated with the Postulated Rupture of Piping," including its attached Branch Technical Position, Mechanical Engineering Branch 3-1 (BTP MEB 3-1).

The staff has determined that Big Rock Point is adequately protected against the dynamic effects of pipe break outside containment except for the screen house.

The screen house contains several pumps and associated piping. Flooding due to a failure in the fire system, the service water system or the circulating water system, could result in submergence of the fire pumps. Spray from such breaks could also affect pumps in the screen house.

The fire pumps have several safety functions at the Big Rock Point plant. Accordingly, the potential to damage both pumps due to flooding should be eliminated. The licensee should ensure that a postulated moderate-energy leakage crack will not disable both fire system pumps.

~~SPENT FUEL POOL~~

Screen House contains several pumps & piping.
Failure of fire system, service H₂O system or
circulating H₂O system could result in
submergence of fire pumps.

TOPIC NO.

TITLE

III-6

Seismic Design Considerations

10 CFR Part 50 (GDC 2) and 10 CFR Part 100, Appendix A require that structures, systems and components important to safety be designed to withstand the effects of natural phenomena such as earthquakes, without loss of capability to perform their safety functions. Seismic requirements are described in Regulatory Guides 1.26, 1.29, 1.61, 1.92, 1.122, and SRP 2.5, 3.7, 3.8, 3.9, and 3.10.

Based upon the NRC staff and its consultants review of the analyses and criteria supplied by the licensee for structures, buried piping and portions of the reactor coolant loop piping, we cannot conclude that these analyses are adequate. Further, significant analyses for piping, equipment and components are yet to be performed, and acceptable analysis criteria have not been established.

In discussion with the licensee, the licensee has indicated that it is economically unfeasible to perform the analyses required to quantify analytical uncertainty. The results of this audit review suggest that considerable detailed review is required.

Buried Piping & portions of reactor coolant loop piping

More info needed

TOPIC NO.

TITLE

V-11.A

Requirements for Isolation of High and Low Pressure Systems

10 CFR 50 (GDC 34) as implemented by SRPs 5.4.7 and 7.6 and BTP RSB 5-1 and ICSB 3 require that low pressure systems be provided with suitable interlocks so that a single failure will not subject the low pressure system to high pressure.

The core spray valves do not satisfy the interlock provisions of SRP Section 6.3 and BTP RSB 5-1.

~~SPENT FUEL
POOL MAKE UP?~~

Core spray valves - single failure

TOPIC NO.TITLE

VI-4

Containment Isolation System

General Design Criteria (GDC) 54, 55, 56, and 57 establish the containment isolation requirements.

The staff review of Big Rock Point has identified the following areas in which the applicable GDC and supporting Standards and Regulatory Guides have not been satisfied:

1. The test, vent and drain lines on many systems have inadequate isolation provisions and are not under administrative control.
2. All ECCS subsystems at Big Rock Point presently have no isolation capabilities or leak detection capabilities outside containment. The licensee is using "locked-open" local manual valves outside containment on these systems which represents a deviation from our current criteria.
3. Instrument lines at Big Rock Point connected to the reactor coolant pressure boundary or the containment atmosphere appear to have none of the isolation provisions described in Regulatory Guide 1.11.
4. The review has indicated that those systems designated as closed inside containment have no isolation provisions outside containment.

In addition, based on a review of Appendix J for Big Rock Point, the staff concludes that:

1. CPC's proposal to test containment airlocks every six months and not within three days of opening does not satisfy the requirements of Appendix J. A satisfactory airlock testing program, which considers the unique features of the Big Rock Point Plant, has been suggested in Section 3.2.1. The issue of more frequent testing, beyond once every six months, has been placed on the list of open items to be resolved as part of the Integrated Assessment under the Systematic Evaluation Program (SEP).
2. CPC's proposed exemption to test the main steam isolation valve and the main steam line drain isolation valve with water and determine acceptability based upon drops per second does not satisfy the requirements of Appendix J. The issue of Type C testing of these valves has been deferred to the SEP, pending resolution of the issue of adequate containment isolation provisions on the main steam and main steam drain lines.
3. An assessment of the leak testing provisions for six penetrations which are claimed to have closed systems inside containment has been deferred pending the completion of the containment isolation system review being conducted on the Big Rock Point Plant under the SEP. If changes in the isolation provisions are required at that time, the staff will establish leak testing requirements for the penetrations in conjunction with the Integrated Assessment of the plant.

Test Vent & Drain lines on many systems have inadequate iso.
ALL ECCS have no isolation capabilities or leak detection provisions outside containment.

TOPIC NO.

TITLE

VIII-3.B

DC Power System Bus Voltage Monitoring and
Annunciation

10 CFR 50.55a(h) as implemented by SRP 8.3.2 and Regulatory Guide 1.47 requires that the dc power system be monitored to the extent that it is shown ready to perform its intended function.

The Big Rock Point control room has no indication of battery current, charger output current, charger output voltage, battery high discharge rate, bus voltage, battery or charger breaker/fuse status or battery current.

Review of Big Rock Point Plant's Request for Deferral
of TMI Action Plan Items Considered Nonessential.

Sedake National Lab. November 1982

Attachment #9

analysis was performed. The review identified no deficiencies that would reduce the credibility of the analysis performed on wide-range-level instrumentation.

Big Rock Point is a small, relatively simple plant with limited options available to the operator in terms of maintaining vessel water inventory. These options for water inventory makeup are the control rod drive hydraulic system, the feedwater system and the fire protection system via the core spray system. The first two injection systems are high pressure with the control rod drive hydraulic providing only limited water makeup capability. The fire protection/core spray is the only low pressure injection system. Due to the very limited choices the operator has available to him to maintain water vessel inventory, especially if one of these systems should fail, it is our contention that the approach to inadequate core cooling requirement of NUREG-0737 be dealt with differently at Big Rock Point. Instead of providing costly instrumentation to detect the approach to inadequate core cooling, since existing instrumentation provides this information, we feel it would be more beneficial for Big Rock Point to improve the reliability/availability of the inventory makeup systems, thereby precluding the need for detection of inadequate core cooling. This, in turn, will reduce the core melt frequency more effectively than providing indication that their limited water makeup capabilities have failed. In other words, at the time of reactor depressurization there is basically no other choice of makeup other than the low pressure core spray system. The operator has no other alternatives. Therefore, additional indication will only serve to reinforce or more accurately define what he already knows--there is inadequate core cooling and there are no further steps the operator can take to prevent it.

Modifications proposed in the Big Rock Point PRA should be pursued further as a viable alternative to the instrumentation requirement as specified in NUREG-0737. Feed system unavailability could be decreased by reducing the instabilities in the secondary side of the plant. Reject line orificing and improving the load rejection capability are feasible modifications addressing feed system unavailability. Alternate injection

Instrumentation for Detection of Inadequate Core Cooling