

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

6/13/83
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USNRC

BEFORE THE NUCLEAR REGULATORY COMMISSION

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In the Matter of)
)
METROPOLITAN EDISON COMPANY)
)
(Three Mile Island Nuclear)
Station, Unit No. 1))
)

Docket No. 50-289
(Restart)

UNION OF CONCERNED SCIENTISTS' PETITION
FOR REVIEW OF ALAB-729

1. The Decision as to Which Review is Sought

ALAB-729, docketed May 26, 1983 and served May 27, 1983, represents the Appeal Board's resolution of the issues concerning TMI-1 plant design and procedures treated in LBP-81-59, 14 NRC 1211 (1981), with the exception of the NEPA/Class 9 accidents contention raised by UCS, which was treated in ALAB-697, December 10, 1982.

2. Statement of Matters as to Which Review is Sought and as to Which Rulings were Erroneous.

a. Are procedures in place at TMI-1 which provide reasonable assurance of reliable decay heat removal?

The single most significant issue treated by ALAB-729 was the adequacy and reliability of the means of decay heat removal available at TMI-1. This is, of course, the core question: Are systems and procedures in place which provide assurance that TMI-1 could cope with a TMI-2 accident? Unfortunately,

the Appeal Board did not answer this question. To begin with, the Appeal Board refused to postulate an accident that might cause or involve core damage. It held that "[w]hile analysis of the TMI-2 accident can provide valuable information to improve the safety of nuclear power plants, the actual scenario of events that occurred during the accident should be considered a typical LOCA." ALAB-729, Sl. Op. at N. 67, p. 41.

Having excluded core damage from consideration, the Board looked only at "typical" small break LOCA's and loss of feedwater events. However, as we will discuss below, some of the considerations crucial to determining the reliability of decay heat removal even for these events were ruled outside the scope of the Appeal Board's review.

The ASLB had found the TMI-1 emergency feedwater (EFW) system not sufficiently reliable for long-term decay heat removal purposes based on the fact that it is not safety-grade and on a quantitative reliability analysis. 14 NRC at 1360-73. The Appeal Board reversed this finding. It rejected the quantitative reliability analysis on specious grounds (ALAB-729, Sl. Op. at 29-31) and failed to adequately consider the fact that the EFW system is not safety-grade.

Most importantly however, the Appeal Board failed to examine the seismic and environmental qualification of the EFW system while the evidence of record to the extent that UCS was allowed to present it, shows that the EFW system is neither seismically nor environmentally qualified, and thus fails to meet the

Commission's minimum requirements for such systems. ^{1/} The Appeal Board felt itself constrained by Commission decisions removing these crucial questions from its purview. ALAB-729, Sl. Op. at 7-9.

Because the Appeal Board's ruling as to EFW reliability was so narrow, and because it is abundantly clear that the EFW system does not meet the Commission's minimum requirements for a system important to safety, the Board was required to "consider the possibility that reliance may have to be placed on other plant systems [i.e. "feed and bleed"] to provide adequate core cooling." ALAB-729, Sl. Op. at 8. In other words, can feed and bleed be relied upon to compensate for failure of the EFW system?

On this issue, the Appeal Board, after four days of reopened evidentiary hearings, agreed with UCS: "[W]e are unable on this record to endorse feed and bleed as a reliable backup system of decay heat removal." Id. at 8-9.

Therefore, the Appeal Board was unable to resolve the central issue of reliable decay heat removal and expressly left it to the Commission to decide:

In light of the bifurcation of issues between the Commission, on the one hand, and the adjudicatory boards, on the other, the Commission must determine--after examining all systems and considering the information that is both within and outside the record before us--whether there is reasonable assurance that Three Mile Island Unit No. 1 can be operated without endangering the health and safety of the public. Id. at 9, emphasis added.

Under these circumstances, the Commission cannot refuse review of

^{1/} The EFW system is not seismically qualified. Transcript before the Appeal Board on Reopened Proceedings, p. 341-9 (Wermiel) (hereinafter "App. Tr."). As to the question of environmental qualification, see LBP-81-59, 14 NRC 1211, at paragraphs 1150-1162. UCS was prevented from pursuing either of these issues in any detail as a consequence of rulings that they were beyond the scope of this proceeding. Id. at paragraph 1162, (environmental qualification); App. Tr. 355 ff.; (seismic qualification).

this portion of ALAB-729.^{2/} While the ASLB and Appeal Board may have had limited jurisdiction (although we believe they unnecessarily restricted their scope in some cases) the Commission cannot avoid its fundamental duty; considering all of the facts, to ensure that operation of TMI-1 does not pose undue risk. We submit that, even had there never been a restart proceeding, the NRC could not permit TMI-1 to operate without sufficiently reliable means of decay heat removal.

b. The pressurizer heater and PORV should be safety-grade.

UCS Contentions 3 and 4 call for the requirement of safety-grade pressurizer heaters for TMI-1. Contention 5 would require the PORV to be safety-grade.

The pressurizer^{*} heaters are used to maintain reactor pressure during natural circulation. ALAB-729, Sl. Op. at 88-89. No party contested the fact that they are at least the "preferred" method of doing so. Id. at 44. If the heaters fail, pressure can be controlled by use of the HPI pumps with the primary system in a water-solid condition. While certainly possible, this mode of operation has serious safety drawbacks and the Appeal Board agreed

^{2/} Because this issue in its totality must be reviewed by the Commission, and because of the 10-page limit on this petition, UCS has not enumerated in detail our differences with the Appeal Board's resolution of other critical subissues. These include those concerning 1) the main steam line rupture detection system (compare ALAB-729, Sl. Op. at 34-35 with UCS Response to ALAB-708 at 3-4, June 19, 1983); 2) the Appeal Board's finding that the pressurizer safety valves can be relied upon to perform the "bleeding" function for feed and bleed. (Compare ALAB-729, Sl. Op. at 82-84 with UCS Proposed Findings of Fact and Conclusion of Law on Reopened Hearing, April 12, 1983, paragraphs 57-71 and transcript references therein) and 3) the fact that feed and bleed poses a clear risk of overpressurizing the reactor vessel (compare ALAB-729, Sl. Op. at 86-7 with UCS Proposed Findings of Fact and Conclusions of Law as Reopened Hearing, paragraphs 105-108). The Board refused to permit UCS to present evidence on this last question, yet proceeded, incredibly, to consider and resolve it against UCS in ALAB-729.

that it "should be avoided." Id. at 47.

The heaters and their circuitry are not safety-grade. The Staff's short-term fix provided for connection of some non-safety grade heater banks to the emergency power supply. The failure of the heaters must be postulated. UCS's testimony was that, not only are the heaters important to safety and their failure would make maintenance of natural circulation extremely difficult, their failure could also imperil the integrity of the power supply to vital emergency safety equipment during an accident; the connection between the heaters and the emergency busses is not safety grade and would allow transference of a fault in the heater circuits to the emergency power supply. Pollard, ff. Tr. 8182, Pollard ff. TR. 960-7. See ALAB-729, Sl. Op. at 88 ff. On the other hand, if the necessary heaters were safety-grade, they could be relied upon to maintain natural circulation and there would be no fear of endangerment to the emergency power supplies.

The Appeal Board ruled that although the function of maintaining natural circulation is "important to safety", the pressurizer heaters are not because "other methods exist" for pressure control. ALAB-729, Sl. Op. at 51. This ruling requires Commission review because it would establish the important precedent that a system is not "important to safety" within the meaning of the NRC rules if there is some other way of performing its function, even if the alternative means (in this case, operation of the plants in a water-solid condition) poses substantial problems as detailed by UCS in its testimony and Brief on Exceptions at 18-19.^{3/}

Moreover, the Appeal Board was actually in error in rejecting UCS's

^{3/} The Appeal Board also seems to rely on the fact that it "may be possible" to achieve cold shutdown before the bubble in the pressurizer is lost. See ALAB-729 at 48. This is purely speculative; the opposite could just as easily be true. In addition, there is not at TMI-1 a safety-grade environmentally qualified path to cold shutdown.

position that the breakers provided for connecting the non-safety heaters to the emergency power supply imperil the integrity of vital safety systems which may be needed during an accident. While the Board ruled that Regulatory Guide 1.75 and GDC 17, which require such breakers to be safety-grade and which are not met by the design in question, do not apply to "reconnection" of the heaters (Id. at 98), it never elucidated a rational distinction in terms of the condition of the plant between those situations where Regulatory Guide 1.75 applies and those where it does not. The fact is that the non-safety heaters may be connected to the vital safety power supply while that power supply is needed and that a fault in the heater circuits could be transferred to the emergency power supply.

As to the PORV, UCS presented testimony detailing the number of functions important to safety which it is required to perform. Pollard, ff. Tr. 9027. The PORV is part of the reactor coolant pressure boundary, it is used to limit challenges to the ECCS, prevent overpressurization of the reactor coolant system at low temperatures, and to depressurize the reactor coolant system under inadequate core cooling conditions. Pollard, ff. Tr. 9027 at 5-4 to 5-5.

There can be no dispute that the PORV is part of the reactor coolant pressure boundary and that GDC 14 applies, requiring an "extremely low probability of abnormal leakage" or other failure. See ALAB-729, Sl. Op. at 103. UCS cannot fathom how the non-safety grade PORV with its non-safety grade circuitry and with the history of PORV operation could possibly be said to present an "extremely low probability" of leakage or failure. The Appeal Board seems to find it on the basis of the speculation that, sometime in the future, GPU will show that the PORV will open in less than 5% of overpressure transients. Id. at 104. First, this demonstration has not been made on this

record. Second, the Board completely ignores the fact that the PORV may inappropriately open because its circuitry and instrumentation is not safety-grade. See UCS Brief on Exceptions, p. 48.

In rejecting UCS' evidence regarding the role of the PORV in overpressure protection, the Board characterized it as a "backup to operator action." ALAB-729 at 109. This ignores testimony indicating that under some plant conditions, the PORV is the only way to limit overpressure. UCS Brief on Exceptions, p. 42-44.

The use of the PORV during inadequate core cooling is deemed outside the scope of the proceeding. ALAB-729 at 110. This ruling is amazing in view of the fact that TMI-2 was an inadequate core cooling event and that the TMI-1 procedures which call for use of the PORV under these conditions were required as a direct result of the accident. Moreover, the Board is simply wrong that the steam generators provide an alternative mechanism for depressurization (Id. at 110) since the operator must use the PORV to control system pressure within 50 psi of steam generator pressure, both the steam generators and PORV are needed. UCS Brief on Exceptions, p. 44-45.

The Appeal Board's resolution of the PORV issue is similar to its approach to the pressurizer heaters: a system need not be safety grade if there is any conceivable alternative means available to perform its concededly important safety function, even if this alternative does not correspond to the operators' training, is clearly not preferable and even poses significant risks. As a matter of policy, this is an extremely unfortunate precedent which the NRC would certainly regret in the future when it is cited by applicants. The Commission should fully consider its implications rather than allow it to stand out of expediency.

CONCLUSION

The Commission should review ALAB-729. The difficult issues concerning the adequacy of decay heat removal were explicitly not resolved by the Appeal Board but were instead presented to the Commission. On one central question--EFW reliability--the Appeal Board's ruling is clearly erroneous and in conflict with the ASLB ruling. Finally, the questions surrounding the safety classification of the pressurizer heaters and PORV pose significant policy considerations warranting the Commission's review. We hope, further, that the Commission will review this entire decision, as originally contemplated.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that copies of "UNION OF CONCERNED SCIENTISTS' PETITION FOR REVIEW OF ALAB-729" have been served on the following persons by deposit in the United States mail, first class postage, this 13th day of June, 1983.

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