

October 25, 1982

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING APPEAL BOARD ~~82~~ OCT 27 110:07

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

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Docket No. 50-289  
(Restart)

OFFICE OF SECRETARY  
REGULATORY & SERVICE  
BRANCH

LICENSEE'S REPLY TO UNION OF CONCERNED  
SCIENTISTS' RESPONSE TO BOARD NOTIFICATION  
BN-82-93 CONCERNING SEMISCALE TESTS OF FEED  
AND BLEED AND MOTION THAT APPEAL BOARD DIRECT  
NRC STAFF TO PROVIDE ALL PERTINENT  
DOCUMENTATION AND ANALYSES

On October 7, 1982, intervenor Union of Concerned Scientists ("UCS") filed "Union of Concerned Scientists' Response to Board Notification BN-82-93 Concerning Semiscale Tests of Feed and Bleed and Motion that Appeal Board Direct NRC Staff to Provide All Pertinent Documentation and Analyses" (hereinafter "UCS Response"). Pursuant to the schedule established in the Appeal Board's Order of October 15, 1982, Licensee herein submits its reply to the UCS Response. Licensee's reply is limited to those portions of the UCS Response which comment upon the relevance and significance of the information contained in BN-82-93 to the record in this case, and which present further argument in support of certain UCS exceptions.

It is Licensee's position that the tests discussed in BN-82-93 are not relevant to the TMI-1 design and therefore do not undermine in any way the Licensing Board's finding

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that feed-and-bleed cooling is viable at TMI-1. In addition, we must correct the UCS characterization of the Licensing Board's findings and of the record evidence.

It should be noted at the outset, however, that while Licensee supports the Licensing Board's finding that feed-and-bleed cooling is highly reliable, LBP-81-59, 14 N.R.C. 1211, 1370-71 (1981), it is not required at TMI-1 in order to support a decision that the plant is safe to operate.<sup>1/</sup> Feed-and-bleed cooling is only required for events beyond the plant design basis. See Jones, ff. Tr. 4588, at 3. Feed-and-bleed cooling is not required except in the event of an extended loss of all main and emergency feedwater. Id.; Tr. 5201 (Jones). The Licensing Board found that the TMI-1 emergency feedwater system at restart will be safety grade for small-break loss-of-coolant accidents and for loss-of-main feedwater transients. 14 N.R.C. at 1372. (PID ¶ 1057). Licensee strongly disagrees with the Licensing Board's findings that reliance nevertheless must be placed upon feed-and-bleed cooling as a backup to the emergency feedwater system at TMI-1 in order to adequately protect the health and safety of the public. See id. Licensee has requested that the Appeal Board modify this conclusion by the Licensing Board. See Licensee's Brief in Opposition . . . , May 10, 1982, at 68-84.

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<sup>1/</sup> The seemingly contrary Licensee testimony cited by UCS (UCS Response at 5-6) later was modified and explained by the witness as having been based upon a misunderstanding of a Licensing Board question. See Tr. 5646-47 (Lanese).

In any case, the tests discussed in BN-82-93 do not apply to an assessment of feed-and-bleed cooling capability at TMI-1. UCS misses the mark by far when it limits its assessment of test applicability to the question of Semiscale "typicality" for large pressurized water reactors. See UCS Response at 6-7. The important factor is the use at Semiscale of low-head High Pressure Injection ("HPI") pumps. These low-head HPI pumps will not deliver water (the "feed" function) to the primary system until the system pressure is below approximately 1600 psi. The TMI-1 plant, however, has high-head HPI pumps capable of providing flow at pressures above the pressurizer safety valve setpoints (2500 psi). Tr. 16,582-83 (M. Ross, Colitz). This difference in HPI pump performance has a notable effect on the manner in which the feed-and-bleed operation is established. See, e.g., BN-82-93, EG&G letter at 4.

In the case of a plant with low-head HPI pumps, the PORV must be latched open early in the transient in order to decrease system pressure below 1600 psi and assure HPI flow. See Tr. 17,095-96 (Wermeil). As noted in BN-82-93, memorandum from Mattson to Eisenhut, calculations performed by Westinghouse show that core uncover would result if feed-and-bleed cooling is not initiated, by opening the PORV, before dry out of the steam generators. Thus, the ability to safely bring the primary system pressure to within the feasible operating band for feed-and-bleed

cooling is highly dependent on the timing of the PORV opening and the ability of the PORV to depressurize the reactor coolant system.

In contrast, at TMI-1 the only action the operator needs to take to establish feed-and-bleed cooling is to actuate the High Pressure Injection system.<sup>2/</sup> Keaten and Jones, ff. Tr. 4588, at 12; Keaten, et al., ff. Tr. 16,522, at 10-11. Because of the high-head HPI design employed at TMI-1, the feed function can be accomplished at pressures in excess of the pressurizer safety valve setpoint (2500 psi). Tr. 16,582-83 (M. Ross, Colitz). The safety valves can be used to provide the bleed function.<sup>3/</sup> 14 N.R.C. at 1281-82, 1370-71.

Thus, at TMI-1 the operator does not need to maneuver the plant to a feasible operating pressure band for feed-and-bleed cooling. Rather, the plant will evolve naturally to

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<sup>2/</sup> If utilized, the PORV may be opened manually. Keaten and Jones, ff. Tr. 4588, at 12, Keaten, et al., ff. Tr. 16,522, at 10. The PORV at TMI-1 can be used to initiate and safely manage feed-and-bleed cooling. The PORV for the bleed function could only lead to lower operating pressures for that cooling mode. By lowering the reactor coolant system pressure, HPI flows would increase and inventory loss decrease.

<sup>3/</sup> UCS asserts that "... the only information available to the Appeal Board shows that the TMI-1 safety valves failed when subjected to two-phase flow in the EPRI tests." UCS Response at 8-9. In fact, the available information shows that the test valve exhibited instabilities with a long inlet piping configuration representative of that at TMI-1, and that it exhibited stable performance when tested on a short inlet configuration. Therefore, Licensee will modify, by restart, the inlet piping to move the valves into a short inlet configuration and to eliminate the loop seal. Licensee's Response to the Atomic Safety and Licensing Appeal Board's Order of July 14, 1982, dated August 12, 1982, at 7-8.

the high pressure condition (2500 psi) in order to open the pressurizer safety valves and thereby establish a heat removal path from the primary system. Keaten, et al., ff. Tr. 16,552, at 8. Uncertainties in obtaining a feasible operating band for feed-and-bleed cooling, the subject of discussion in BN-82-93, are therefore eliminated with the use of high-head HPI pumps.

While Licensee believes that the above analysis of the inapplicability of this particular Semiscale test to TMI-1 is dispositive of the UCS Response, it is also important to correct the substantial mischaracterization by UCS of the evidentiary record when it boldly asserts that the record contains no evidence that any analysis has been done to demonstrate the viability of feed-and-bleed cooling at TMI-1 for a primary system pressure band encompassing 2500 psi. See UCS Response at 7-8. Having itself ignored a major part of the record, UCS proceeds to describe the relevant testimony by Licensee and the Staff as "simplistic," and accuses the Licensing Board of having "accorded feed and bleed cooling the presumption of innocence." See id. at 10-11.

The Licensing Board devoted considerable attention at the hearing, and in its Partial Initial Decision, to a review of the post-TMI-2-accident efforts by Licensee and the Staff to analyze additional LOCA events. See 14 N.R.C. at 1328-1340.<sup>5/</sup>

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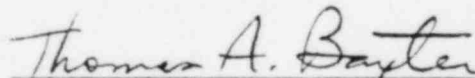
<sup>5/</sup> UCS did not file proposed findings on these issues with the Licensing Board or file exceptions to that Board's decision on Additional LOCA Analysis.

Several of these analyses involved a break with delayed feedwater delivery. One in particular, however, analyzed a loss of all feedwater without a break and assumed, inter alia, that the PORV does not open and the pressurizer safety valves open for decay heat removal. See Jones and Broughton, ff. Tr. 5038, at 5 and 13 (Table 2); Licensee Ex. 9, and oral summary at Tr. 5064-73 (Jones). This evaluation is essentially a confirmation or demonstration of the feed and bleed mode of core cooling. Tr. 5066 (Jones).

In conclusion, the UCS Response starts from the faulty premise that feed-and-bleed cooling capability is essential to operation of TMI-1, proceeds to display an astonishing ignorance of the state of the record on the viability of that cooling mode at TMI-1, and concludes by advancing an inapplicable test as illustrative of a weakness in the record on which the Licensing Board relied. There is nothing in BN-82-93 which affects the record under review in association with the UCS exceptions.

Respectfully submitted,

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Dated: October 25, 1982

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CERTIFICATE OF SERVICE

I hereby certify that copies of "Licensee's Reply to Union of Concerned Scientists' Response to Board Notification BN-82-93 Concerning Semiscale Tests of Feed and Bleed and Motion that Appeal Board Direct NRC Staff to Provide All Pertinent Documentation and Analyses" were served this 25th day of October, 1982, by hand delivery upon the parties identified by an asterisk and by deposit in the U.S. mail, first class, postage prepaid, to the other parties on the attached Service List.

  
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Thomas A. Baxter, P.C.



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