RELATED CORRESPONDENCE

LIC 10/28/80

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
METROPOLITAN EDISON COMPANY	)	Docket No. 50-289
	)	(Restart)
	)	
(Three Mile Island Nuclear Station, Unit No. 1)	)	

LICENSEE'S TESTIMONY OF

ROBERT C. JONES, JR.

IN RESPONSE TO BOARD QUESTIONS 6.e and 6.f

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OUTLINE

The purposes and objectives of this testimony are to respond to Board Questions 6.e and 6.f. The testimony shows that in the event of a loss of all feedwater there is sufficient assurance that operation in the feed and bleed mode will provide adequate core cooling.

INTRODUCTION

This testimony, by Mr. Robert C. Jones, Jr., Supervisory Engineer, ECCS Analysis Unit, Babcock & Wilcox Company, is addressed to Board Questions 6.e and 6.f. Each question addressed is quoted below, followed immediately by Licensee's response to the question.

BOARD QUESTI0N 6.e

> If the emergency feedwater system were to fail, what assurance do we have that the system can be cooled by the feed-and-bleed mode? This is of particular concern if the PORV's and safety valves have not been tested under two-phase mixtures.

RESPONSE

BY WITNESS JONES:

Licensee's testimony in response to UCS Contentions 1 and 2 (Natural and Forced Circulation) (pages 6-8) describes the basic energy removal processes associated with assuring adequate core cooling and how these relate to feed and bleed operation. Licensee's testimony in response to UCS Contention 8 and ECNP Contention 1(e) (Additional LOCA Analysis) (pages 5, 6, 8, 13, 14, 16 and 19) presents the results of analyses which have been performed which verify the capability of the feed and bleed mode to provide adequate core cooling. The only action

required of the pressurizer power operated relief valve (PORV) and safety valves is that one or more of these valves open to provide a fluid discharge path. The fact that the safety valves can be expected to open upon such a demand is discussed in Licensee's testimony in response to the Board Question regarding UCS Contention 6. Therefore, there is sufficient assurance that in the event of a loss of all feedwater feed and bleed operation can provide adequate core cooling.

BOARD QUESTION 6.f

> Can the system be taken to cold shutdown with the feed-and-bleed cooling only? Are both high pressure injection (HPI) pumps required to dissipate the decay heat in the feed-and-bleed mode? The board would like an evaluation of the reliability of the feed-and-bleed system. Has there been any experience using that system?

RESPONSE

BY WITNESS JONES:

Feed and bleed operation would not directly take the primary system to a cold shutdown condition. As stated in Licensee's testimony in response to UCS Contentions 1 and 2 (page 12), however, feed and bleed operation can be continued as required to assure adequate core cooling until secondary side cooling is available and/or the primary system can be depressurized to allow the Low Pressure Injection (LPI) system

to provide core cooling directly. One or both High Pressure Injection (HPI) system pumps are calculated to be required for adequate feed and bleed cooling, depending on the specific scenario postulated - see Licensee's testimony in response to UCS Contention 8 and ECNP Contention 1(e) (pages 5, 6, 8, 13, 14, 16 and 19). For a loss of all feedwater event without a small-break loss of coolant accident, however, only one HPI pump is required to assure adequate core cooling - see previous reference (pages 5 and 13).

A quantitative assessment of the reliability of the feed and bleed mode of operation has not been performed. Feed and bleed cooling is not required, however, except for an extended loss of all feedwater or for certain accident conditions in conjunction with an extended loss of all feedwater - see Licensee's testimony in response to UCS Contentions 1 and 2 (pages 6 and 7) and in response to UCS Contention 8 and ECNP Contention 1(e) (pages 5, 6, 8, 13, 14, 16 and 19). Additionally, feed and bleed cooling can be accomplished using only safety-grade equipment - see Licensee's testimony in response to UCS Contentions 1 and 2 (page 12) - and the actions required are not complex. Therefore, it is concluded that feed and bleed operation is adequately reliable for the potential function.

During the February 26, 1980 event at Crystal River 3, the HPI injected water into the primary system and fluid was

discharged initially by the pressurizer power operated relief valve and then by a safety valve. Therefore, the incident was a demonstration of the operability of feed and bleed cooling. It should be noted also that during a portion of the Crystal River transient, secondary side cooling was significantly reduced or non-existent. Throughout the scenario, however, the core was adequately cooled. Additionally, the individual systems and components required for feed and bleed cooling are routinely operated and/or tested to assure their functionability (e.g., HPI, LPI and safety valves). Therefore, there is experience that feed and bleed operation can provide adequate core cooling.

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Education:

B.S., Nuclear Engineering,
Pennsylvania State University, 1971.
Post Graduate Courses in Physics,
Lynchburg College.

Experience:

June 1971-June 1975: Engineer, ECCS Analysis Unit, B&W. Performed both large and small break ECCS analyses under both the Interim Acceptance Criteria and the present Acceptance Criteria of 10 CFR 50.46 and Appendix K.

June 1975-Present: Acting Supervisory Engineer and Supervisory Engineer, ECCS Analysis Unit, B&W. Responsible for calculation of large and small break ECCS evaluations, evaluations of mass and energy releases to the containment during a LOCA, and performance of best estimate pretest predictions of LOCA experiments as part of the NRC Standard Problem Program. Involved in the preparation of operator guidelines for small-break LOCA's and inadequate core cooling mitigation.