

MAY 15 1979

MEMORANDUM FOR John G. Davis, Acting Director
Office of Inspection and Enforcement

FROM Roger J. Mattson, Director
Division of Systems Safety

SUBJECT TMI-2 INVESTIGATION

The attached copy of an August 9, 1978 letter from B&W to the Davis-Besse licensee was handed to me by a reporter at last Friday's ACRS meeting. At page two it indicates that B&W advised at least one of its owners some months ago of the need to observe both pressurizer level and RCS pressure to assure that the RCS is filled. Since this is a topic of interest in evaluating the circumstances surrounding the TMI-2 accident, I thought it might be of use to your people in their investigatory activities.

Original signed by
Roger J. Mattson

Roger J. Mattson, Director
Division of Systems Safety

Enclosure:
As stated

cc: P. Collins, DPM
D. Ross, DPM
R. Tedesco, DSS
T. Novak, DSS
V. Stello, DOR

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Mr. T. D. Murray, Station Superintendent
Davis-Besse Nuclear Power Station
5501 North State Route #2
Oak Harbor, Ohio 43449

Subject: SMUD Rapid Cooldown Transient

Dear Terry:

On March 20, 1978, Rancho Seco experienced a severe thermal transient initiated by the loss of electrical power to a substantial portion of the Non-Nuclear Instrumentation (NNI). The loss of power directly caused the loss of Control Room indication of many plant parameters, the loss of input of these parameters to the plant computer, and erroneous input signals (midrange, zero, or otherwise incorrect) to the Integrated Control System (ICS).

The plant response was not the usual transient in that the ICS responded to the erroneous input signals rather than actual plant conditions, and resulted in a Reactor Protection System (RPS) trip on high pressure. Subsequent to the Reactor Trip, the erroneous signals to the ICS contributed to the rapid cooldown of the RCS. Plant operators had extreme difficulty in determining the true status of some of the plant parameters and in controlling the plant because of the erroneous indications in the Control Room.

An investigation of the events following this loss of power points out a need for a close look at operator training and emergency operating procedures for any loss of NNI power (or portion thereof). The following recommendations are made to assist your staff in a review of training and procedures, to assure proper operator action for events of this nature.

1. Operators should be trained to recognize a loss of power to all or a majority of their NNI (e.g. indicators fail to mid-range, automatic or manual transfer to alternate instrument strings brings no response). The loss of power is emphasized here rather than the failure of any one instrument or control signal which are adequately covered in current simulator training courses.

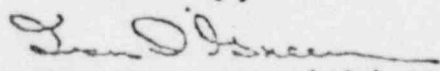
2. Given that the operator can determine that electrical power has been lost to all or part of the NNI, he should know the location of the power supply breakers, and have a procedure available to quickly regain power.
3. If the fault cannot be cleared (i.e. the breakers to the power supplies reopen), the operator should have a list of alternate instrumentation available to him, and he should be thoroughly trained in its use. Examples are:
 - a. ESFAS panels
 - b. RPS panels
 - c. ECI (Essential Controls and Instrumentation)
 - d. SRCI (Safety Related Controls and Instrumentation)
 - e. Remote shutdown panels
 - f. Local gages
 - g. Plant computer
4. Recognizing that no procedure can cover all possible combinations of NNI failures, the operator's response should be keyed to certain variables. If the operator realizes that he has an instrumentation problem (as opposed to a LOCA or steam line break, for example), he can limit the transient by controlling a few critical variables:
 - a. Pressurizer level (via EPI or normal Makeup Pumps)
 - b. RCS pressure (via Pressurizer heaters, spray, E/M relief valves, etc.)
 - c. Steam Generator level (via feed flow, feedwater valves, etc.)
 - d. Steam Generator pressure (via turbine bypass system)

The pressurizer level and RCS pressure assure that the Reactor Coolant System is filled; the Steam Generator level and pressure assure adequate decay heat removal.

Attachments 1 and 2 are provided to give a brief description of the events following this loss of NNI power at Rancho Seco. As can be seen by this transient, prompt precise operator action and the ability to recognize a loss of NNI power are critical factors in limiting the severity of a transient such as this.

If you have any questions or comments, please advise.

Yours truly,


Ivan D. Green (517) 631 8830
Site Operations Manager

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encl.

cc: See attached sheet.