

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of  
METROPOLITAN EDISON COMPANY  
et al.

Docket No. 50-289

(Three Mile Island Nuclear  
Station, Unit 1)

NRC STAFF TESTIMONY OF DENWOOD F. ROSS, JR.  
RELATIVE TO THE SUFFICIENCY OF  
THE PROPOSED ADDITIONAL REQUIREMENTS  
(BOARD QUESTION 2)

Board Question 2: (Tr. 2392) "The board stated its concern with having an adequate record on the sufficiency of the proposed short-term and long-term actions to protect the health and safety of the public.

Without further explanation the question may appear to invite conclusionary testimony of the ultimate factual issues to be decided by the board. (Commission's August 9, 1979 Order, 10 NRC 141, 128.) This is not what the board has in mind as a response to the question. Our concerns were expressed in part in the June 23, 1980 memorandum on the staff's report on TMI-1 accident sequences. To explain further: We assume that the staff and licensee may present evidence that each Category A and each Category B recommendation in Table B-1 of NUREG-0578 (Orders items ST 8 and LT 3),

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and that each preventative and mitigative measure identified with respect to a given accident sequence in the staff's TMI-1 Core Damage Accident Sequence Report will be, at least, sufficient to resolve the related safety problem or accident sequence. However, nowhere have we seen in the Restart Report, SER, the Accident Sequence Report, or elsewhere, an explanation as to how the staff or licensee has determined that all of the necessary TMI-2 related recommendations have been identified and that all the appropriate accident sequences have been addressed. The board wants testimony or other evidence which explains, if such be the case, how the licensee and the staff have concluded that the NUREG-0578 short- and long-term recommendations, other subsequent safety recommendations, and the identified accident sequences (with their respective preventative or mitigative measures) are in their totality sufficient to provide reasonable assurance that TMI-1 can be operated without endangering the health and safety of the public. The question is not intended to enlarge the scope of the hearing. The response may be limited to consideration of accidents following a loss-of-feedwater transient."

Response:

The Board's question appears to be directed toward two key points:

- (1) How has the staff determined that all the necessary TMI-2 related recommendations have been identified? and,

- (2) Based upon the identified recommendations, how has the staff determined that the corrective measures to be implemented on TMI-1 are in their totality sufficient to provide reasonable assurance that TMI-1 can be operated without endangering the health and safety of the public?

The thrust of this testimony, as amplified below, is to show with reasonable assurance that:

- (1) There have been sufficient redundant, independent, and diverse investigations into the accident at TMI-2 such that the causes and their associated corrective measures have been identified;
- (2) The necessary and sufficient corrective measures to allow TMI-1 restart have been identified and will be implemented prior to restart; and,
- (3) The remaining TMI-2-related changes and modifications have also been identified and will be implemented on TMI-1 on the same schedule as other B&W-designed operating plants. (As will be discussed later in this testimony, clarification of the scope and schedule for many of the requirements listed in the TMI Action Plan (NUREG-0660) have just recently been developed. Commission approval of these changes occurred on October 28, 1980. The document is in the process of being published at the present time. A copy will be provided to the Board and Parties as soon as it becomes available.)

The accident at TMI-2 was investigated by many groups, both inside and outside of the NRC. Those who investigated the accident include Congress, the General Accounting Office, the President's Commission on the Accident at Three Mile Island, the NRC Special Inquiry Group, the NRC Advisory Committee on Reactor

Safeguards (ACRS), the Office of Nuclear Reactor Regulation's Lessons Learned Task Force and Bulletins and Orders Task Force, the Special Review Group of the Office of Inspection and Enforcement, as well as separate studies conducted by the NRC's Siting Task Force, and the NRC's Offices of Standards Development and Nuclear Regulatory Research.

The recommendations of each of these groups, as well as the President's response to the recommendations of the President's Commission on the Accident at Three Mile Island, were collected and integrated into a single document entitled, "NRC Action Plan Developed as a Result of the TMI-2 Accident" (NUREG-0660, May 1980). Volume 1 of the Action Plan divides those recommendations into five chapters, each of which covers one broad subject: namely, I Operational Safety; II Siting and Design; III Emergency Preparedness and Radiation Effects; IV Practices and Procedures; and V NRC Policy, Organization, and Management. Volume 2 of the Action Plan lists the recommendations of the investigative organizations and cross-references them to the appropriate requirement in Volume 1.

In developing the Action Plan, the recommendations of all the principal investigations were assessed. These assessments were made under the direction of the TMI Action Plan Steering Group, which served to integrate and coordinate the development of the Action Plan. The Commission, the ACRS, the Executive Director for Operations, and the directors of the NRC's program offices reviewed and commented on the various drafts of the plan. Their guidance, decisions, and directions were followed in refining the plan. The Commission reviewed the plan throughout its development and on June 16, 1980, issued a Statement of Policy approving the Action Plan. Thus, the Action Plan represents a

comprehensive and integrated plan for the actions now judged necessary and sufficient by the Nuclear Regulatory Commission to correct or improve the regulation and operation of nuclear facilities based upon the experience from the accident at TMI-2 and the official studies and investigations of the accident. Such a collective and comprehensive assessment by persons, both inside and outside the NRC having expert knowledge over a broad range of technical disciplines provides reasonable assurance that the probable causes of the accident at TMI-2 and their associated corrective measures have been completely and adequately identified.

Throughout the decision-making process, there was agreement that the accident demonstrated that improvements in safety were needed. There was also general agreement, among the various investigators, as to the probable causes of the accident and the failures and errors that occurred before and during the event, both in equipment and in the organizations that built, operated, and regulated the plant. Therefore, there was also general agreement as to the areas where improvement should be made. Where differences of opinion occurred, they most often related to the degree of improvement required and the best method of achieving that improvement. This general agreement provides further assurance that all significant deficiencies related to the accident have been identified in the Action Plan.

Many of the items in the Action Plan provide significant and well understood safety improvement, as well as being practical to accomplish in a relatively short period of time. Other items in the Action Plan are not as narrowly defined, specific, or urgent in nature. Many of these items require detailed and complex engineering analyses by vendors, licensees and/or the NRC prior to

identifying if any additional changes or modifications to plant systems or components are necessary. Certain hardware modifications will require the procurement of components or systems that are still under technological development. Other items require rulemaking on the part of the NRC and still others require research or studies to identify what remedial measures, if any, should be taken over the next several years to provide more comprehensive or more desirable solutions to interim improvements.

There was general concurrence by the investigative organizations, that it was not necessary to shutdown all reactors until all improvements were incorporated. To the contrary, it was deemed that the short-term improvements had restored or enhanced the margin of safety and that more deliberate, planned improvements would not only be acceptable, but preferable. Thus, the Action Plan presents a sequence of actions that will result in a gradually increasing improvement in safety as individual actions are completed and the initial modifications are replaced or supplemented by longer term, more durable improvements.

Based upon the discussion above, the staff believes there is reasonable assurance that the totality of the requirements listed in the Action Plan contain all of the necessary and sufficient requirements stemming from the accident at TMI-2. It is from this belief that the remainder of this testimony will show how the staff has identified the subset of Action Plan items applicable to TMI-1 and how the staff has concluded that the requirements to be implemented on TMI-1 prior to restart are sufficient to provide reasonable assurance that the facility can be operated without endangering the health and safety of the public.

Figure 1, attached to this testimony, shows how the 279 individual items contained in the Action Plan have been assessed as to their applicability to TMI-1. A total of 186 Action Plan items do not apply to TMI-1 at this time for one of the following reasons:

- (1) 126 action items either do not apply to licensees/applicants or the items may ultimately lead to new requirements, but in a manner not yet determined (i.e., items require further definition of scope, need, and criteria);
- (2) 16 action items have been incorporated into other items of the Action plan;
- (3) 7 action items are plant specific and do not apply to TMI-1; and,
- (4) 37 action items are NSSS Vendor specific and do not apply to B&W-designed reactors.

Of the remaining 93 action items, all are applicable to TMI-1: 9 require NRC implementation, 83 require licensee implementation, and 1 requires a joint implementation. Table 1, attached to this testimony, lists each item in the Action Plan and shows into which category each has been placed. Since Table 1 uses only the alphanumeric designation for each action plan item (for ease of reading) a cross-reference listing (alphanumeric designation and associated short title) has been provided as Table 3, attached to this testimony.

Each of the 84 (83 licensee and 1 joint) items in the Action Plan that require licensee implementation have or will be required to be implemented as discussed below.

On August 9, 1979, prior to the completion of many of the TMI-2 accident investigations and development of the Action Plan, the Commission issued an Order and Notice of Hearing to Metropolitan Edison Company. The Order specified the required short-term actions that the licensee must complete prior to TMI-1 restart. In addition, the Order identified those long-term requirements which the licensee would have to demonstrate reasonable progress toward completing prior to resumption of operation. A comparison of the items in the Commission's Order of August 9th with the items in the Action Plan shows that a total of 54 Action Plan items are incorporated into the Order. (Refer to Table 2, attached to this testimony).

In parallel with developing the Action Plan, a major staff effort was undertaken to determine which of the recommendations identified in the Action Plan should be required to be implemented by applicants prior to issuance of a new operating license. On May 15, 1980, the Commission approved the list of TMI-related requirements for new operating licenses. This list was officially published in a document entitled, "TMI-Related Requirements for New Operating Licenses" (NUREG-0694, June 1980). The requirements selected for implementation were those that the staff believed were needed, that were sufficiently characterized and studied at the time, and that were known to have significant safety improvement potential. NUREG-0694 divided the requirements into four types: (1) those required to be completed by an applicant prior to receiving a fuel-loading and low-power testing license, (2) those required to be completed by an applicant prior to receiving a license to operate at full power, (3) those actions that the NRC itself would take prior to issuing a fuel-loading and low-power testing or a full-power license, and (4) those requirements to be completed by a licensee prior to a specified date. It was anticipated at the time NUREG-0694

was issued that, as work continued on the Action Plan, additional dated requirements would be issued. It was also anticipated that the dates specified in both the Action Plan and NUREG-0694 might be too tight in some cases to allow reasonable time for completion of the work (e.g., analyses or equipment procurement) required to implement certain recommendations. As a result, the staff stated in NUREG-0694 that it would allow case-by-case exceptions to the dated requirements if good cause was shown. It was further stated in NUREG-0694 that dated requirements were not preconditions for licensing of new plants. That is, a dated requirement need not be met by newly licensed plants until the completion deadline. However, if a completion deadline fell before an operating license issuance date, then that requirement would be a prerequisite for the new operating license. The staff has taken the position with TMI-1 (see NRC Staff testimony of Robert W. Reid relative to staff's position on NUREG-0694 and/or NUREG-0660 (Board Questions 1 & 5)) that the requirements stated in NUREG-0694 will have to be satisfied. That is, if a requirement in NUREG-0694 is required to be implemented by applicants prior to issuance of a fuel-loading or full power license, it shall be implemented on TMI-1 prior to restart. Dated requirements, whose completion deadline falls before restart, shall be a condition of restart. Dated requirements, whose completion deadline falls after restart, should not be a precondition for restart.

NUREG-0694 contains a total of 48 requirements which must be completed by the licensee. Of these, 30 requirements are already covered by the Commission Order. The 18 additional requirements are listed on Table 2. All but 3 of the 18 (items I.C.7, I.C.8 and I.B.1) requirements are being applied to all operating reactors as well as plants under construction. The staff has taken

the position that the additional 18 requirements involve significant safety improvement and thus warrant completion by the licensee prior to operation of TMI-1.

As part of the continuing effort by the staff to clarify and implement the remaining items of the Action Plan, the staff issued a letter to all licensees of operating plants, applicants for operating licenses and holders of construction permits, dated September 5, 1980 (later supplemented by a letter dated September 9, 1980), that provided preliminary clarification of all TMI Action Plan requirements for both operating reactors and plants under construction. This document covered in total all TMI-related requirements from the Action Plan which have been approved for implementation by the Commission. Following issuance of the preliminary clarification, regional meetings were held with the public and industry to obtain their comments on the requirements. Based upon the oral comments received at the regional meetings and a number of written responses, the staff revised the September 5, 1980 draft. A copy of the revised draft was sent to the Commission on October 22, 1980, requesting their approval of the proposed clarifications and changes. Commission approval was received on October 28, 1980. The clarification letter and its enclosures are being issued as NUREG-0737.

It is the staff's intention to send to operating reactor licensees, including Metropolitan Edison, the revised document asking for their commitment to meet all specified dates. Following staff evaluation of the responses, the staff will assure that such commitments are appropriately enforceable. This may include, as needed, the issuance of Confirmatory or Show Cause Orders. The

staff has taken the position that all requirements approved for implementation on B&W-designed operating reactors will be required on TMI-1 (as stated in the staff's response to Board Question 5). Since NUREG-0737 will contain Action Plan requirements which have previously been required of the licensee, either via the Commission Order or through NUREG-0694, the net impact of this document will be to add an additional 11 TMI-related requirements for TMI-1: 1 involving procedure verification, 1 related to reporting requirements, 6 involving analysis and 3 that could lead to equipment modifications. All of the additional items are dated requirements and as such are not necessarily preconditions for restart unless the implementation dates approved by the Commission fall due prior to the actual TMI-1 restart date. (Refer to Table 2 for a complete listing of all dated requirements).

NUREG-0737 will contain several changes in scope and/or schedule to items previously issued to licensees and applicants. Therefore, where a modification has been made to the scope of schedule of a required Action Plan item, NUREG-0737 will be binding on applicants and licensees.

It is anticipated that, as work continues on the Action Plan, additional requirements will be issued to licensees and applicants. It is the staff's position that any additional requirements that are issued on TMI-1 will be implemented in the same manner and on the same schedule as is required for all B&W-designed operating plants.

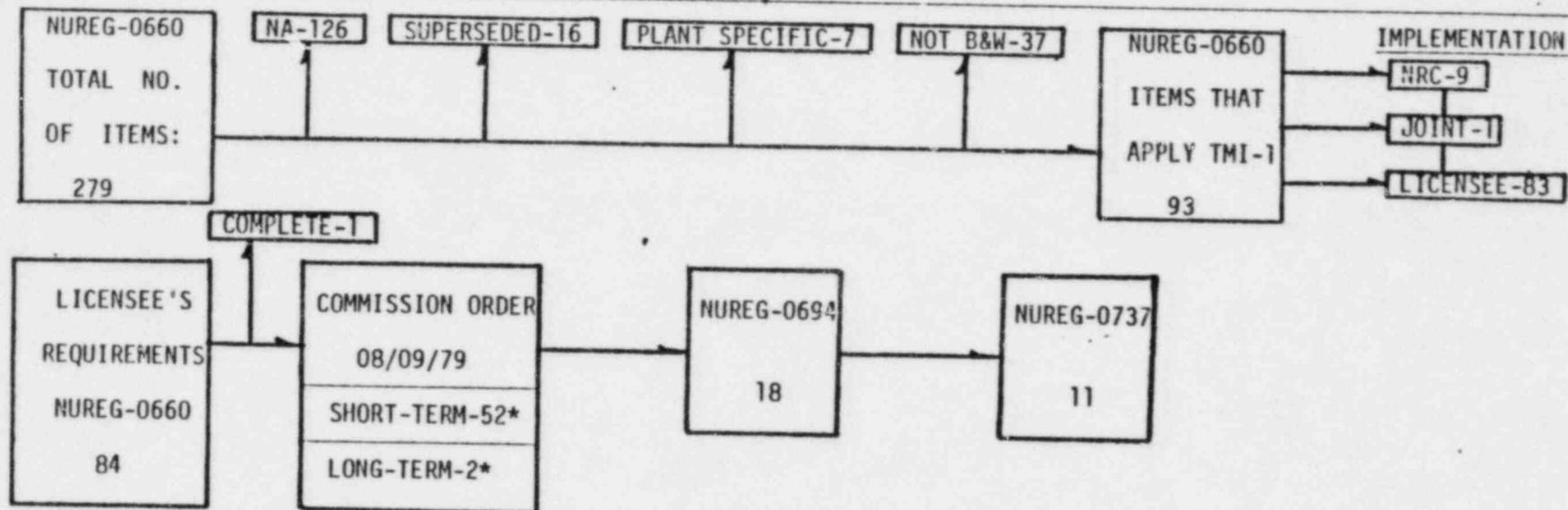
In summary, the staff has reasonable assurance, based upon the process by which the Action Plan was developed, that all areas needing improvement as a result of the accident at TMI-2 have been identified in NUREG-0660. In addition,

the staff has reasonable assurance, by the work described above to implement the Action Plan, that the subset of items from NUREG-0660 that provides the most significant improvements in safety have been identified and will be required to be implemented on TMI-1 prior to restart. The combination of the "short-term actions" required by the August 9, 1980 Order and the items identified in NUREG-0694 as being necessary prior to issuance of a full load or full power license comprise this subset. All remaining requirements, applicable to TMI-1, will be required to be completed by the licensee on an implementation schedule that is consistent with that specified in NUREG-0737 for operating reactors. In the staff's judgement, this latter group of requirements will result in a gradually increasing improvement in safety as individual actions are completed by the licensee.

Figure 1

Applicability of TMI Action Plan Items to TMI-1

This figure illustrates how the 279 items contained in NUREG-0660 apply to TMI-1. A total of 93 are applicable to TMI-1. The 84 to be implemented by the licensee are requirements of either the Commission Order, NUREG-0694, or NUREG-0737.



KEY

- NUREG-0660....."NRC Action Plan Developed as a Result of the TMI-2 Accident" (May 1980)
- NUREG-0694....."TMI-Related Requirements for New Operating Licenses" (June 1980)
- NUREG-0737....."Clarification of TMI Action Plan Requirements" (Proposed. Commission approval received October 28, 1980.)
- "NA".....Action item does not apply to licensees or the item may ultimately lead to new requirements, but in a manner not yet determined by the staff.
- "Superseded"....Requirement of the action item incorporated into another item of the Action Plan.
- "Plant Specific".....Action item identifies the specific plant(s) to which the item applies.
- "Not B&W".....Action item is not applicable to B&W-designed reactors.
- "NRC".....Action item required by NUREG-0694 to be implemented by NRC. (No licensee action required)
- "Joint".....Action item required by NUREG-0694 to be implemented jointly by NRC and licensee.
- "Licensee".....Action item required to be implemented by licensee.
- "Complete".....Action item complete (II.K.2.21-"LOFT 3-1 Predictions," B&W Submittal December 13, 1979)
- "\*".....Of the 52 short-term requirements of the Order, 13 carry over to long-term requirements as Category "B" Lessons Learned.

Table 1  
Applicability of TMI Action Plan Items to TMI-1

ITEM	APPLICABILITY	ITEM	APPLICABILITY	ITEM	APPLICABILITY
I.A.1.1	Ref. 1, 2, 3	II.A.1	NA	II.K.1.1	Ref. 1, 3
.2	Ref. 1, 2, 3	.2	NA	.2	Ref. 1, 3
.3	Ref. 2, 3	II.B.1	Ref. 1, 2, 3	.3	Ref. 1, 3
.4	NA	.2	Ref. 1, 2, 3	.4	Ref. 1, 3
I.A.2.1	Ref. 2, 3	.3	Ref. 1, 2, 3	.5	Ref. 1, 2, 3
.2	NA	.4	Ref. 2, 3	.6	Ref. 1, 3
.3	Ref. 2,3	.5	NA	.7	Ref. 1, 3
.4	NA	.6	Plant Specific	.8	Ref. 1, 3
.5	NA	.7	NRC	.9	Ref. 1, 3
.6	NA	.8	NRC	.10	Ref. 1, 2, 3
.7	NA	II.C.1	Plant Specific	.11	Ref. 1, 3
I.A.3.1	Ref. 2, 3	.2	Plant Specific	.12	Ref. 1, 3
.2	NA	.3	Plant Specific	.13	Ref. 1, 3
.3	NA	.4	NA	.14	Not B&W
.4	NA	II.D.1	Ref. 1, 2, 3	.15	Not B&W
.5	NA	.2	NA	.16	Not B&W
I.A.4.1	NA	.3	Ref. 1, 2, 3	.17	Not B&W
.2	NA	II.E.1.1	Ref. 1, 2, 3	.18	Ref. 1, 3
.3	NA	.2	Ref. 1, 2, 3	.19	Ref. 1, 3
.4	NA	.3	NA	.20	Ref. 1, 2, 3
I.B.1.1	NA	II.E.2.1	NA	.21	Ref. 1, 2, 3
.2	Ref. 1, 2	.2	NA	.22	Not B&W
.3	NA	.3	NA	.23	Not B&W
I.B.2.1	NA	II.E.3.1	Ref. 1, 2, 3	.24	Ref. 1, 3
.2	NRC	.2	NA	.25	Ref. 1, 3
.3	NA	.3	NA	.26	Ref. 1, 3
.4	NA	.4	NA	.27	Ref. 1, 3
I.C.1	Ref. 1, 2, 3	.5	NA	.28	Ref. 1, 3
.2	Ref. 1, 2, 3	II.E.4.1	Ref. 1, 2, 3	II.K.2.1	Ref. 1
.3	Ref. 1, 2, 3	.2	Ref. 1, 2, 3	.2	Ref. 1, 2
.4	Ref. 1, 2, 3	.3	NA	.3	Ref. 1
.5	Ref. 2, 3	.4	NA	.4	Ref. 1
.6	Ref. 3	II.E.5.1	NA	.5	Ref. 1
.7	Ref. 2	.2	NA	.6	Plant Specific
.8	Ref. 2	II.E.6.1	NA	.7	Plant Specific
.9	NA	II.F.1	Ref. 1, 2, 3	.8	Superseded
I.D.1	Ref. 2, 3/NRC	.2	Ref. 1, 2, 3	.9	Ref. 1, 2, 3
.2	Ref. 3	.3	NA	.10	Ref. 2, 3
.3	NA	.4	NA	.11	Ref. 1
.4	NA	.5	NA	.12	Ref. 1
.5	NA	II.G.1	Ref. 1, 2, 3	.13	Ref. 2, 3
.6	NA	II.H.1	NA	.14	Ref. 2, 3
I.E.1	NA	.2	NA	.15	Ref. 2, 3
.2	NA	.3	NA	.16	Ref. 2, 3
.3	NA	.4	NA	.17	Ref. 3
.4	NA	II.J.1.1	NA	.18	Superseded
.5	NA	.2	NA	.19	Ref. 3
.6	NA	.3	NA	.20	Ref. 3
.7	NA	.4	NA	.21	Completed
.8	NA	II.J.2.1	NA	II.K.3.1	Ref. 3
I.F.1	NA	.2	NA	.2	Ref. 3
.2	NA	.3	NA	.3	Ref. 2, 3
I.G.1	Ref. 2	II.J.3.1	NA	.4	Superseded
.2	NA	.2	NA	.5	Ref. 3
		II.J.4.1	NA	.6	Superseded

Table 1 (Cont.)

ITEM	APPLICABILITY	ITEM	APPLICABILITY	ITEM	APP
II.K.3.7	Superseded	III.A.1.1	Ref. 1, 2, 3	V.5	NA
.8	Superseded	.2	Ref. 1, 2, 3	.6	NA
.9	Not B&W	.3	NA	.7	NA
.10	Not B&W	III.A.2.1	NA	.8	NA
.11	Ref. 2	.2	NA	.9	NA
.12	Not B&W	III.A.3.1	NRC	.10	NA
.13	Not B&W	.2	NA	.11	NA
.14	Not B&W	.3	NRC	.12	NA
.15	Not B&W	.4	NA	.13	NA
.16	Not B&W	.5	NA	.14	NA
.17	Ref. 3	.6	NA	.15	NA
.18	Not B&W	III.B.1	NA	.16	NA
.19	Not B&W	.2	NRC	.17	NA
.20	Plant Spec.	III.C.1	NA		
.21	Not B&W	.2	NA		
.22	Not B&W	III.D.1.1	Ref. 1, 2, 3		
.23	Not B&W	.2	NA		
.24	Not B&W	.3	NA		
.25	Not B&W	.4	NA		
.26	Not B&W	III.D.2.1	NA		
.27	Not B&W	.2	NA		
.28	Not B&W	.3	NA		
.29	Not B&W	.4	NRC		
.30	Ref. 3	.5	NA		
.31	Ref. 3	.6	NA		
.32	NA	III.D.3.1	NA		
.33	Superseded	.2	NA		
.34	NA	.3	Ref. 1, 2, 3		
.35	Superseded	.4	Ref. 2, 3		
.36	NA	.5	NA		
.37	Superseded	IV.A.1	NA		
.38	Superseded	.2	NA		
.39	Superseded	IV.B.1	NA		
.40	Superseded	IV.C.1	NA		
.41	Superseded	IV.D.1	NA		
.42	Superseded	IV.E.1	NA		
.43	Superseded	.2	NA		
.44	Not B&W	.3	NA		
.45	Not B&W	.4	NA		
.46	Not B&W	.5	NA		
.47	Not B&W	IV.F.1	NRC		
.48	Not B&W	.2	NA		
.49	Not B&W	IV.G.1	NA		
.50	Not B&W	.2	NA		
.51	Not B&W	.3	NA		
.52	Not B&W	.4	NA		
.53	Not B&W	IV.H	NA		
.54	Superseded	V.1	NA		
.55	Not B&W	V.2	NA		
.56	Not B&W	V.3	NA		
.57	Not B&W	V.4	NA		

KEY

Ref.1 - Commission Order of 08/09/79  
 Ref.2 - NUREG-0694  
 Ref.3 - NUREG-0737

The following abbreviations are defined on Figure 1: "NA", "Superseded", "Plant Specific", "Not B&W", "NRC", and "Complete."

Table 2

Listing of Action Plan Requirements Applicable to TMI-1

COMMISSION ORDER-08/09/79

COMPLETE PRIOR TO RESTART

I.A.1.2 (ST8)\* II.K.1.12 (ST2)  
 I.B.1.2 (ST6) II.K.1.13 (ST2)  
 I.C.2 (ST8) II.K.1.18 (ST2)  
 I.C.3 (ST8) II.K.1.19 (ST2)  
 I.C.4 (ST8) II.K.1.20 (ST2)  
 II.D.3 (ST8) II.K.1.21 (ST2)  
 II.E.1.1 (ST1a) II.K.1.24 (ST2)  
 II.E.3.1 (ST8) II.K.1.25 (ST2)  
 II.G.1 (ST8) II.K.1.26 (ST2)  
 II.K.1.1 (ST2) II.K.1.27 (ST2)  
 II.K.1.2 (ST2) II.K.1.28 (ST2)  
 II.K.1.3 (ST2) II.K.2.1 (ST1a)  
 II.K.1.4 (ST2) II.K.2.2 (ST1b)  
 II.K.1.5 (ST2) II.K.2.3 (ST1c)  
 II.K.1.6 (ST2) II.K.2.4 (ST1d)  
 II.K.1.7 (ST2) II.K.2.5 (ST1e)  
 II.K.1.8 (ST2) II.K.2.11 (ST1e)  
 II.K.1.9 (ST2) III.A.1.1 (ST3)  
 II.K.1.10 (ST2) III.D.1.1 (ST8)  
 II.K.1.11 (ST2)

DEMONSTRATE REASONABLE PROGRESS

Category "B" Lessons Learned\*

I.A.1.1 (ST8/LT3) II.E.4.1 (ST8/LT3)  
 I.C.1 (ST8/LT3) II.E.4.2 (ST8/LT3)  
 II.B.1 (ST8/LT3) II.F.1 (ST8/LT3)  
 II.B.2 (ST8/LT3) II.F.2 (ST8/LT3)  
 II.B.3 (ST8/LT3) III.A.1.2 (ST8/LT3)  
 II.D.1 (ST8/LT3) III.D.3.3 (ST8/LT3)  
 II.E.1.2 (ST8/LT3)

Long-Term Requirements

II.K.2.9 (LT1)  
 II.K.2.12 (LT2)

NUREG-0694

COMPLETE PRIOR TO RESTART

I.A.1.3  
 I.A.2.1  
 I.A.2.3  
 I.A.3.1  
 I.C.5  
 I.C.7  
 I.C.8  
 I.D.1  
 I.G.1  
 II.B.4  
 II.K.2.10  
 II.K.2.13  
 II.K.2.14  
 II.K.2.15  
 II.K.2.16  
 II.K.3.3  
 II.K.3.11  
 \*\*III.D.3.4 (P)

NUREG-0737

COMPLETE AS SCHEDULED FOR OPERATING REACTORS

II.K.2.17 Generic Submittal Under Staff Review  
 II.K.2.19  
 II.K.2.20  
 \*I.A.1.1 01/01/81  
 I.C.6  
 II.K.3.2  
 II.K.3.17  
 \*III.D.3.3  
 II.E.1.2 07/01/81  
 \*II.E.4.1  
 \*II.E.4.2  
 II.K.3.1  
 \*I.C.1 01/01/82  
 \*II.B.1  
 \*II.B.3  
 \*II.F.1  
 \*II.F.2  
 II.K.3.30  
 II.K.3.5 03/01/82  
 \*II.B.2 06/30/82  
 \*II.D.1 07/01/82  
 \*III.A.1.2  
 II.K.3.31 01/01/83  
 \*\*III.D.3.4 (C)  
 I.D.2 Schedule Not Yet Determined

NOTES:

- + - (ST) or (LT) short or long term item of Order.
- \* - All Category "B" Lessons Learned items have Category "A" subparts that must be accomplished prior to restart.
- \*\* - III.D.3.4 (P) - Review and Schedule  
 III.D.3.4 (C) - Modifications

Table 3

Complete Listing of Action Plan Items by Alphanumeric Designation and Short Title

ITEM	TITLE
I.A.1.1	Shift Technical Advisor
I.A.1.2	Shift Supervisor Admin. Duties
I.A.1.3	Shift Manning
I.A.1.4	Long-Term Upgrading
I.A.2.1	Immed. Upgrading RO & SRO Train. & Quals.
I.A.2.2	Training & Quals. of Operations Personnel
I.A.2.3	Administration of Training Programs
I.A.2.4	NRR Participation in Inspector Training
I.A.2.5	Plant Drills
I.A.2.6	Long-Term Upgrading of Training & Quals.
I.A.2.7	Accreditation of Training Institutions
I.A.3.1	Revise Scope & Criteria for Licensing Exams
I.A.3.2	Operator Licensing Program Changes
I.A.3.3	Requirements for Operator Fitness
I.A.3.4	Licensing of Additional Operations Personnel
I.A.3.5	Establish Stat. of Under. with INPO & DOE
I.A.4.1	Initial Simulator Improvement
I.A.4.2	Long-Term Training Simulator Upgrade
I.A.4.3	Feasibility Study for NRC Simulator
I.A.4.4	Feasibility Study for NRC Eng. Computer
I.B.1.1	Organization and Management Long-Term Improv.
I.B.1.2	Eval. of Organization & Management for NTOLs
I.B.1.3	Loss of Safety Function
I.B.2.1	Revise IE Inspection Program
I.B.2.2	Resident Inspector at Operating Reactors
I.B.2.3	Regional Evaluations
I.B.2.4	Overview of Licensee Performance
I.C.1	Short-Term Accident Anal. & Proc. Revisions
I.C.2	Shift and Relief Turnover Procedures
I.C.3	Shift Supervisor Responsibilities
I.C.4	Control Room Access
I.C.5	Proc. for Feedback of Oper. Experience
I.C.6	Proc. for Ver. of Corr. Perform. of Oper. Act.
I.C.7	NSSS Vendor Review of Procedures
I.C.8	Pilot Monitoring of Selected EPs for NTOLs
I.C.9	Long-Term Program Plan for Upgrading Procedures
I.D.1	Control Room Design Reviews
I.D.2	Plant Safety Parameter Display Console
I.D.3	Safety System Status Monitoring
I.D.4	Control Room Design Standard
I.D.5	Improved Control Room Inst. Research
I.D.6	Technology Transfer Conference
I.E.1	Office for Anal. & Eval. of Oper. Data
I.E.2	Program Office Operational Data Activities
I.E.3	Operational Safety Data Analysis
I.E.4	Coodin. of Licensee, Indus., & Reg. Programs
I.E.5	Nuclear Plant Reliability Data System
I.E.6	Reporting Requirements
I.E.7	Foreign Sources
I.E.8	Human Error Rate Analysis

Table 3 (Cont.)

I.F.1	Expand QA List
I.F.2	Develop More Detailed QA Criteria
I.G.1	Preop & Low Pwr. Training Requirements
I.G.2	Scope of Preop & Low Pwr. Test Program
II.A.1	Siting Policy Reformulation
II.A.2	Site Eval. of Existing Facilities
II.B.1	Reactor Coolant System Vents
II.B.2	Plant Shielding
II.B.3	Post-Accident Sampling
II.B.4	Training for Mitigating Core Damage
II.B.5	Research on Degraded Core & Core Melt
II.B.6	Risk Red. for ORs at High Pop. Den. Sites
II.B.7	Analysis of Hydrogen Control
II.B.8	Rulemaking on Degraded Core Accidents
II.C.1	Interim Reliability Eval. Prog. (IREP)
II.C.2	Continuation of IREP
II.C.3	Systems Interaction
II.C.4	Reliability Engineering
II.D.1	Relief & Safety Valve Testing Requirements
II.D.2	Research on Relief & Safety Valve Testing
II.D.3	Relief & Safety Valve Position Indication
II.E.1.1	Auxiliary Feedwater System (AFWS) Eval.
II.E.1.2	AFWS Automatic Initiation & Flow Indication
II.E.1.3	Update Stand. Review Plan and Develop Reg. Guide
II.E.2.1	Reliance on ECCS
II.E.2.2	Research on SBLOCAs and Anomalous Transients
II.E.2.3	Uncertainties in Performance Predictions
II.E.3.1	Reliability of Pwr. Supplies for Nat. Circ.
II.E.3.2	Systems Reliability
II.E.3.3	Coordinated Study of S/D Heat Removal Req.
II.E.3.4	Alternate Concepts Research
II.E.3.5	Decay Heat Removal Regulatory Guide
II.E.4.1	Containment Dedicated Penetrations
II.E.4.2	Containment Isolation Dependability
II.E.4.3	Containment Integrity Check
II.E.4.4	Containment Purging
II.E.5.1	Design Evaluation of B&W Sensitivity
II.E.5.2	B&W Reactor Transient Response Task Force
II.E.6.1	In Situ Testing of Valves - Adequacy Study
II.F.1	Additional Accident Monitoring Instrumentation
II.F.2	Ident. & Recovery from Conditions of ICC
II.F.3	Inst. for Monitoring Acc. Conds. (RG 1.97)
II.F.4	Study of Control and Protection Act. Design Regs.
II.F.5	Classification of Inst., Cont., & Elect. Equipment
II.G.1	Power Supplies for Pressurizer Equipment
II.H.1	Safety of TMI-2 and Minimize Environmental Impact
II.H.2	Tech. Conditions on TMI-2 Containment Structure
II.H.3	Eval. & Feedback of Info. Obtained from TMI-2
II.H.4	Impact of TMI-2 (Socioeconomic & Property Values)
II.J.1.1	System for Conducting Vendor Inspections
II.J.1.2	Mod. Existing Vendor Inspection Program
II.J.1.3	Increase Reg. Control Over Nonlicensees
II.J.1.4	Resident Inspectors at Vendors & AE Firms