

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))

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NRC STAFF'S AND LICENSEE'S JOINT PROPOSED
INTRODUCTORY FINDINGS

UNITED STATES OF AMERICA
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INTRODUCTION AND BACKGROUND

A. Commission Hearing Orders

1. Metropolitan Edison Company (Licensee or Met Ed) is holder of Facility Operating License No. DPR-50 which authorized the operation of the nuclear power reactor known as Three Mile Island Nuclear Station, Unit No. 1 (the facility or TMI-1), at steady state power levels not in excess of 2535 megawatts thermal (rated power). The facility is a Babcock and Wilcox (B&W) designed pressurized water reactor (PWR) located at the Licensee's site ten miles southeast of Harrisburg, Pennsylvania.

2. On March 28, 1979, TMI-1's sister unit, Three Mile Island Nuclear Station, Unit No. 2 (TMI-2) experienced a severe accident. On that date TMI-1 had been shut down for refueling and had not yet returned to power. Licensee voluntarily kept

TMI-1 shut down until July 2, 1979, at which time the Nuclear Regulatory Commission (NRC or Commission) ordered that "the Unit No. 1 facility, presently in a shutdown condition, shall remain shutdown until further order of the Commission itself." The Commission determined it was in the public interest that a hearing precede restart of TMI-1.

3. In an Order and Notice of Hearing on August 9, 1979, Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), CLI-79-8, 10 N.R.C. 141 (1979), the Commission specified its concerns that gave birth to the July 2, 1979 Suspension Order, appointed this Atomic Safety and Licensing Board (Board) to conduct the hearing, and specified the procedures to govern this proceeding. On the basis of the TMI-1 hearing and the recommendations of this Board, the Commission is to determine whether restart of TMI-1 will be permitted and, if so, under what conditions.

4. The August 9, 1979 Order noted that the NRC Staff's evaluation of the accident at TMI-2, which also uses a B&W designed PWR, had ascertained "that B&W designed reactors appear to be unusually sensitive to certain off-normal transient conditions originating in the secondary system." 10 N.R.C. 141 at 143. Because of certain design features, B&W designed reactors were said to place more reliance than do other PWR designs on the reliability and performance characteristics of the auxiliary feedwater system, the integrated control system, and the emergency core cooling system (ECCS)

performance to recover from frequent anticipated transients. This was viewed as placing a larger burden on the plant operators in the event of off-normal system behavior during such transients. 10 N.R.C. 141 at 143.

5. The August 9th Order further explained that after a preliminary review of the TMI-2 accident, the NRC Staff initially identified several human errors that occurred during the accident contributing significantly to its severity. The NRC Staff began an immediate reevaluation of the design features of B&W reactors to determine if additional safety corrections or improvements were necessary. As a result of the evaluation a bulletin was issued by Inspection and Enforcement (IE) instructing owners of B&W designed reactors to take certain actions concerning B&W's unusual sensitivity to certain off-normal transient conditions originating in the secondary system. Besides the items identified for other B&W reactors, the NRC Staff identified additional safety concerns for TMI to be resolved prior to restart.¹

6. Based on these reviews and concerns, the Commission's Director of Nuclear Reactor Regulation (NRR) recommended that

¹ These concerns resulted from (1) potential interaction between Unit 1 and the damaged Unit 2, (2) questions about the management capabilities and technical resources of Metropolitan Edison, including the impact of the Unit 2 accident on these, (3) the potential effect of operations necessary to decontaminate the Unit 2 facility on Unit 1, and (4) recognized deficiencies in emergency plans and station operating procedures. 10 N.R.C. 141 at 143-44.

certain "short-term actions" be required of the Licensee to resolve the Commission's concerns and to permit a finding of reasonable assurance that the facility can safely resume operation.² The Commission said it had additional concerns,

2 The "short-term" actions:

1. The licensee shall take the following actions with respect to TMI-1:

- (a) Upgrade the timeliness and reliability of the Emergency Feedwater (EFW) system by performing the items specified in Enclosure 1 of the Licensee's June 28, 1979 letter. Changes in design will be submitted to the NRC Staff for review.
- (b) Develop and implement operating procedures for initiating and controlling EFW independent of Integrated Control System (ICS) control.
- (c) Install a hard-wired control grade reactor trip on loss of main feedwater and/or on turbine trip.
- (d) Complete analyses for potential small breaks and develop and implement operating instructions to define operator action.
- (e) Augment the retraining of all Reactor Operators and Senior Reactor Operators assigned to the control room including training in the areas of natural circulation and small break loss of coolant accidents including revised procedures and the TMI-2 accident. All operators will also receive training at the B&W simulator on the TMI-2 accident and the licensee will conduct a 100 percent reexamination of all operators in these areas. NRC will administer complete examinations to all licensed personnel in accordance with 10 C.F.R. 55.20-23.

(2) The licensee shall provide for NRC review and approval of all applicable actions specified in IE Bulletins 79-05A, 79-05B, and 79-05C.

(3) The licensee shall improve his emergency preparedness in accordance with the following:

which, though they need not be resolved prior to resumption of

(continued)

- (a) Upgrade emergency plans to satisfy Regulatory Guide 1.101 with special attention to action level criteria based on plant parameters.
- (b) Establish an Emergency Operations Center for Federal, State and Local Officials and designate a location and an alternate location and provide communications to plant.
- (c) Upgrade offsite monitoring capability, including additional thermoluminescent dosimeters or equivalent.
- (d) Assess the relationship of State/Local plans to the Licensee plans so as to assure the capability to take emergency actions.
- (e) Conduct a test exercise of its emergency plan.

(4) The licensee shall demonstrate that decontamination and/or restoration operations at TMI-2 will not affect safe operations at TMI-1. The Licensee shall provide separation and/or isolation of TMI-1/2 radioactive liquid transfer lines, fuel handling areas, ventilation systems, and sampling lines. Effluent monitoring instrument shall have the capability of discriminating between effluents resulting from Unit 1 or Unit 2 operations.

(5) The licensee shall demonstrate that the waste management capability, including storage and processing, for solid, liquid, and gaseous wastes is adequate to assure safe operations of TMI-1, and that TMI-1 waste handling capability is not relied on by operations at TMI-2.

(6) The licensee shall demonstrate his managerial capability and resources to operate Unit 1 while maintaining Unit 2 in a safe configuration and carrying out planned decontamination and/or restoration activities. Issues to be addressed include the adequacy of groups providing safety review and operational advice, the management and technical capability and training of operations staff, the adequacy of the operational Quality Assurance program and the facility procedures, and the capability of important support organizations such as Health Physics and Plant Maintenance.

(7) The licensee shall demonstrate his financial qualifications to the extent relevant to his ability to operate TMI-1 safely.

TMI-1 operation, must be satisfactorily addressed in a timely manner. The Commission's Director of NRR recommended that certain "long-term actions" be required of licensee to permit a finding of reasonable assurance of long-term safety.³

7. In its August 9, 1979 Order the Commission set out the subjects to be included and considered at this hearing:

(A) Whether the "short-term actions" recommended by the Director of Nuclear Reactor Regulation are necessary and sufficient to provide reasonable assurance that TMI-1 can be

(continued)

(8) The licensee shall comply with the Category A recommendations as specified in Table B-1 of NUREG-0578.* See, 10 N.R.C. 141 at 144-45.

*NUREG-0578 is the TMI-2 Lessons Learned Task Force Status Report.

3 The "long-term" actions:

(1) Submit a failure mode and effects analysis of the ICS to the NRC staff as soon as practicable;

(2) Give continued attention to transient analysis and procedures for management of small breaks by a formal program set up to assure timely action of these matters;

(3) comply with the Category B recommendations as specified in Table B-1 of NUREG-0578; and,

(4) Improve emergency preparedness in accordance with the following:

- (a) modify emergency plans to address changing capabilities of plant instrumentation,
- (b) extend the capability to take appropriate emergency actions for the populations around the site to a distance of ten miles. See, 10 N.R.C. 141 at 145.

operated without endangering the health and safety of the public, and should be required before resumption of operation should be permitted.

(B) Whether the "long-term actions" recommended by the Director of Nuclear Reactor Regulation are necessary and sufficient to provide reasonable assurance that the facility can be operated for the long term without endangering the health and safety of the public, and should be required of the licensee as soon as practicable. 10 N.R.C. 141 at 148.

8. The Commission's Order further guided the Board:

If the Board determines that operation can be resumed upon completion of certain specific short-term actions by the licensee, it shall consider the extent to which the licensee has demonstrated reasonable progress toward completion of the long-term actions described in this section. If it finds that the licensee has demonstrated reasonable progress, it shall recommend resumption of operation upon completion of the short-term actions. If it cannot make such a finding, it shall recommend that operation be resumed at a date that it believes appropriately reflects the importance of the action involved, the time lost because such progress had not been made on the prescribed schedule and the overriding need to provide adequate protection for the public health and safety. 10 N.R.C. 141 at 149.

9. The August 9, 1979 Order further provided that the hearing before this Board should be conducted in accordance with the provisions of the Commission's Rules of Practice governing adjudicatory licensing proceedings.

10. The Commission on March 6, 1980, issued another Order, CLI-80-5, providing further guidance regarding the management competence issues by specifying 13 specific issues which the Board should examine. These issues are individually discussed in the management capability section of this recommended decision.

11. On March 14, 1980, the Commission issued a further Order to make clear that it was intended by the Commission that any party to the proceeding might raise as an issue whether one or more safety concerns, not specifically listed as "short-term" in the Commission's August 9, 1979 Order should be satisfactorily resolved prior to startup, so long as they satisfy the requirements (e.g. specificity and basis) applicable to contentions generally and there is a reasonable nexus between the issue and the TMI-2 accident. The Board's rulings on contentions had from the outset followed this guidance and continued to do so throughout the proceeding.⁴

12. Finally, on March 23, 1981, the Commission issued a further order (CLI-81-3) modifying its August 9, 1979, Order

⁴ Atomic Safety and Licensing Board Memorandum and Order, March 28, 1980.

and removing the matter of Licensee's financial qualifications from the scope of this proceeding.

B. Interventions and Appearances

13. Many entities filed petitions to intervene in August and September of 1979. The Board admitted the following petitioners as intervenors in this proceeding: Union of Concerned Scientists (UCS), Three Mile Island Alert, Inc. (TMIA), Mr. Marvin I. Lewis,⁵ Ms. Marjorie Aamodt, Mr. Steven C. Sholly, Anti-Nuclear Group Representing York (ANGRY), Environmental Coalition on Nuclear Power (ECNP),⁶ Chesapeake Energy Alliance (CEA), Newberry Township TMI Steering Committee (Newberry Petitioners). The Commonwealth of Pennsylvania, the Pennsylvania Public Utilities Commission, the New Jersey Board of Public Utilities, the Pennsylvania Consumer Advocate and Dauphin County were admitted as special participants under 10 C.F.R. § 2.715(c). The Commonwealth of Pennsylvania participated actively and helpfully in all phases of the hearing and

5 The Board ruled that Mr. Lewis had not shown standing in the proceeding and therefore dismissed most of Mr. Lewis' contentions. However, as a matter of discretion, the Board did allow Mr. Lewis to intervene solely with respect to his contention on the adequacy of the TMI-1 filter system for radioactive effluents -- a contention not advanced by any other intervenor.

6 Regarding ECNP, in May of 1980 the Licensee moved for sanctions against ECNP based on this intervenor's failure to comply with a Board Order compelling discovery. We declined to dismiss ECNP as a party but did dismiss many of its contentions. Metropolitan Edison Company, (Three Mile Island Nuclear Station, Unit 1) LBP-80-17, 11 N.R.C. 893 (1980).

presented direct testimony on the Commonwealth's emergency plan. The Pennsylvania Public Utilities Commission and the Pennsylvania Consumer Advocate participated in only limited phases of the hearing. Dauphin County and the New Jersey Board of Public Utilities elected not to attend any of the evidentiary hearing.

14. We deferred ruling on People Against Nuclear Energy (PANE) status as intervenors until the Commission determined whether psychological stress issues (the only issues sought to be litigated by PANE) could be considered. The Board certified this question to the Commission in Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit 1), LEP-80-8, 11 N.R.C. 297 (1980), where we concluded the Commission within its discretion may and should consider psychological stress under NEPA for the purpose of mitigating community fears about the operation of TMI-1. The Commission in a Memorandum and Order, CLI-80-39 of December 5, 1980, was evenly divided on the question. A vote of 2-2 on this question constituted an effective denial of requests to admit the psychological stress issue. We were told to consider this a denial of these contentions and that "there is no authorization for the Board to admit psychological stress contentions." The Commission noted it would reconsider the question upon confirmation of a fifth Commissioner.

15. The Board denied petitions to intervene by Ms. Jane Lee, Ms. Frieda Berryhill, representing the Coalition of

Nuclear Power Plant Postponement, and Victaulic Company, et al, either for lack of standing or failure to advance an acceptable contention, or both.

16. The Board received more than 1,000 written limited appearance statements directed either to the Board or to one or more Commissioners, which we considered and directed to be placed in the public record. In addition, the Board held special sessions to hear oral limited appearances on November 15, 16 and 17, 1979, and again on March 5, 1981. Subsequently the Board permitted additional limited appearances by appointment in the course of scheduled hearings. Over 200 individuals availed themselves of the opportunity to make statements.

17. The record of the hearing includes the written and oral testimony of witnesses presented by Licensee, the NRC Staff, the Commonwealth of Pennsylvania and by several intervenors. In the findings of fact below, citations to the direct written testimony received into evidence refer only to the last name of the witness(es) and to the transcript page immediately preceding the prepared testimony. For the convenience of the Board and parties, we have also compiled an alphabetical listing by witness, Appendix A to this decision, which fully identifies each piece of testimony sponsored by each witness and which identifies the location in the transcript of all of the written testimony.

18. The record also includes exhibits which were offered and received into evidence or rejected by the Board. Appendix

B to this decision is a list of exhibits which were marked for identification and identifies those exhibits received or rejected by the Board.⁷

C. Rulings on Contentions

19. The contentions which were allowed by the Board are enumerated later in this decision and are not repeated here. Nor does the Board attempt to recite the disposition of each of the many contentions which were challenged by Licensee or the Staff and which were either disallowed or revised by the Board. We do recite, however, some of the main principles which guided the Board in its rulings on contentions.

a. Scope of Proceeding. The Board addressed the question of the scope of the hearing in its First Special Prehearing Conference Order, dated December 18, 1979. It rejected Licensee's position that only contentions related to the bases for suspending TMI-1's operating authority, as recited in the Commission's August 9, 1979 Order, should be allowed. It also rejected the position of several intervenors that any contention be allowed which would be allowable in an initial operating license proceeding. The Board ruled instead that it would admit any otherwise allowable contention having a reasonable nexus to the TMI-2 accident. This principle guided

⁷ The Appendices to this decision identify only the testimony and exhibits introduced by the close of the hearing session of May 1, 1981; supplemental Appendices will be provided at the close of the record.

the Board both in ruling on the allowability of contentions and in its subsequent rulings on the allowability of direct testimony and the scope of cross-examination.

b. Class 9 Accidents. The Board limited or rejected contentions based solely on the proposition that because the TMI-2 accident can be classified as a Class 9 accident (i.e., involving accident sequences outside the scope of the design basis accidents) the occurrence of a full spectrum of Class 9 accidents at TMI-1, up to and including accidents involving core melt and breach of containment, could simply be assumed as the basis for the contention. We did not limit intervenor contentions to design basis accidents, but we did insist that contentions based on Class 9 accidents specify specific accident scenarios having a reasonable nexus to the TMI-2 accident.

c. Basis and Specificity. The Board was liberal in allowing initially a number of contentions which were at best marginal as to basis and specificity and which did not adequately put Licensee and the Staff on notice of the matters which needed to be addressed in testimony. These contentions were allowed subject to the qualification that further basis and specificity could be obtained by the Licensee and Staff through discovery. In several instances, particularly in the case of ECNP and CEA, the Board subsequently dismissed contentions where the intervenor failed to answer interrogatories inquiring into the bases and specifics of contentions and ignored Board Orders compelling them to respond.

d. Withdrawn Contentions. During the course of the hearings a number of intervenors withdrew contentions, citing in many cases a lack of resources to pursue the contentions. It was the Board's practice to review contentions dropped by intervenors, to assess the importance of the contention and to ascertain whether issues raised by the contention were adequately covered by the contentions of other intervenors. In a number of instances, where the Board felt that the hearing record might otherwise be inadequate and incomplete, the Board adopted contentions as Board questions and required Licensee and the Staff to address the withdrawn contention in testimony. (Not infrequently the contention was withdrawn so late in the game that Licensee and the Staff had already filed testimony in response to the contention.) In some instances the Board also permitted intervenors to adopt contentions which had been withdrawn by another intervenor.

20. In addition to rulings in accordance with the foregoing general principles, the Board made a number of special rulings on specific contentions which are discussed later in this decision in connection with the specific contentions.

21. The Board and parties accepted Licensee's proposal to group contentions into the following major categories:

- a. Plant design and procedures.
- b. Separation of TMI-1 and TMI-2.
- c. Management qualifications of Licensee.
- d. Emergency planning.

This grouping and sequence of contentions was followed generally in the presentation of evidence at the hearing, although a number of pieces of supplemental testimony were generated as a result of Board questions or intervenor cross-examination and were sandwiched into the proceeding as preparation time and hearing time permitted. A fifth category of contentions, i.e., those dealing with Licensee's financial qualifications, was eliminated from the hearing as a result of the Commission's Order of March 23, 1981.

22. The August 9, 1979 Order instructed the Board to consolidate participation of parties pursuant to 10 C.F.R. § 2.715a to the maximum extent practicable consistent with the provisions of that regulation. All of the intervenors objected to consolidation and neither Licensee nor the Staff favored involuntary consolidation through Board order. The Board followed, instead, the practice of requiring that intervenors with similar contentions appoint a lead intervenor for the presentation of evidence and cross-examination on such issues.

D. Miscellaneous Rulings

23. In the period between the August 9, 1979 Order and commencement of the evidentiary hearing on October 15, 1980, the Board was called upon frequently not only to resolve differences as to the allowability of contentions but to rule on discovery disputes, prehearing and hearing schedules and a wide variety of other procedural matters. Prehearing conference orders dealing with these matters were issued on

December 18, 1980, January 11, 1980, January 25, 1980, February 29, 1980 and May 22, 1980. The final prehearing conference was held on August 12 and 13, 1980 in Harrisburg pursuant to 10 C.F.R. § 2.752, and the final prehearing conference order was issued August 20, 1980. In addition, the Board issued a large number of rulings on motions and requests submitted in separate filings. The total number of prehearing documents filed with or issued by the Board, exclusive of prefiled testimony, was well over 1,000.

24. The issuance of the Staff's safety evaluation report proved in this proceeding as in others to be a critical path item. Without attempting to assign blame or responsibility as between Licensee (who provided information required by the Staff to complete its evaluation) and the Staff (which generated detailed criteria for the short-term and long-term actions specified in the Commission's August 9, 1979 Order and reviewed materials submitted by Licensee), delay in the issuance of the safety evaluation report largely accounted for the delay in the commencement of the evidentiary hearing as compared to the target schedule attached to the Commission's August 9, 1979 Order. This delay enabled the Board to extend the discovery periods contemplated in the August 9, 1979 Order without delaying the commencement of the hearing. The Board also afforded intervenors an opportunity for supplemental discovery following the issuance of the safety evaluation report and major supplements and following several revisions

made by Licensee in its emergency plans in the course of the proceeding.

25. Most of the intervenors requested financial assistance to support their interventions. These requests were initially denied by the Board as outside the scope of its authority. On May 16, 1980, the Commission announced, in a departure from previous policy, that the then current Commission generally favored intervenor funding as a matter of policy, but it nevertheless denied a request to provide financial assistance to intervenors in this restart proceeding in light of Congressional disapproval of the use of appropriated funds for such purposes in fiscal year (FY) 1980.

Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), CLI-80-19, 11 N.R.C. 700 (1980). On the same day in response to a certification to the Commission from this Board, the Commission announced it would not provide financial assistance to intervenors to address the psychological distress issue. Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), CLI-80-20, 11 N.R.C. 705 (1980). In another certification to the Commission dated August 8, 1980, we requested the Commission to extend its rule governing procedural assistance in adjudicatory licensing proceedings to this restart proceeding so as to allow the Board to consider intervenor requests for free transcripts. Metropolitan Edison Company (Three Mile Island Nuclear Station, Unit No. 1), LBP-80-23, 12 N.R.C. 227 (1980). As explained in its

certification, the Board viewed such assistance as an important contribution to the efficiency of the hearing process. In a December 4, 1980 Memorandum, the Chairman cited a December 3, 1980 letter by the Comptroller General of the United States that the NRC procedural assistance program may not lawfully use any FY 81 appropriation funds. The Commission directed the Board and the Staff to immediately cease such assistance program.

APPENDIX A

WRITTEN TESTIMONY RECEIVED INTO EVIDENCE

<u>Witness</u>	<u>Following Transcript Page</u>
<u>Aamodt, Marjorie</u>	
"Intervenor Marjorie Aamodt's [Testimony] Regarding Aamodt Contention No. 2 Con- trol Room Operator Training and Testing"	12931
"Aamodt Testimony to Support Aamodt Contention 4"	14517
<u>Adler, Vernon E.</u>	
"Testimony of FEMA's Vernon E. Adler and Frederick J. Bath on Contentions Related to Offsite Emergency Preparedness"	18975
<u>Allenspach, Frederick R.</u>	
"NRC Staff Testimony of Lawrence P. Crocker and Frederick R. Allenspach Relating to Contention Aamodt #2"	12653
<u>Arnold, Robert C.</u>	
"Licensee's Testimony of Mr. Robert C. Arnold Regarding CLI-80-5, Issue (1), ANGRY Contention No. IV and Sholly Contention No. 14(a) (Licen- see's Command and Administrative Structure)"	11434
<u>Ballard, Blaine, Sr.</u>	
"Licensee's Testimony of Daniel M. Shovlin, Melvin G. Snyder, Richard R. Harper, Dennis V. Dyckman and Blaine Ballard, Sr. in Response to CLI-80-5, Issue 2, TMIA Contention 5, Sholly Contention 14(e), and ANGRY Conten- tion IV (Maintenance at TMI-1)"	13533
<u>Barley, Richard</u>	
"Licensee's Testimony of William F. Itschner, Richard Barley, James Moore and Charles Pelletier in Response to the Lewis Contention and ANGRY Conten- tion No. V(D)(Filters)"	9919

<u>Bath, Frederick J.</u>	
"Testimony of FEMA's Vernon E. Adler and Frederick J. Bath on Contentions Related to Offsite Emergency Preparedness"	18975
"Joint Testimony of NRC Staff's Stephen Chesnut and FEMA's Frederick J. Bath on Contentions Related to Onsite/Offsite Emergency Preparedness"	19626
<u>Belser, Adolph L.</u>	
"Joint Testimony of Adolph L. Belser (PEMA), Randy L. Curry (York County) and Michael E. Wertz (Dauphin County) Pertaining to York and Dauphin County Emergency Planning (Contentions EP-6, EP-14 and EP-16)"	20787
<u>Beyea, Jan</u>	
"Direct Testimony of Dr. Jan Beyea on Behalf of the Anti-Nuclear Group Representing York Regarding A.N.G.R.Y. Contention No. III B(D)"	18350
<u>Boger, Bruce A.</u>	
Page 5, "NRC Staff Testimony of J. Wermiel, W. Jensen, E. Lantz and B. Boger Regarding Emergency Feedwater System Reliability (Board Question 6)"	5616
"NRC Staff Testimony of Walton L. Jensen Jr., John C. Voglewede, Bruce A. Boger, and Peter L. Hearn Relative to Instrument Ranges (ECNP Contention 1d)"	7548
"NRC Staff Testimony of Bruce A. Boger Regarding Bypass and Inoperable Status Indication (UCS Contention 9)"	9893
"NRC Staff Testimony of Bruce A. Boger Regarding Licensed Operator Training (Aamodt Contention #2)"	12770
"NRC Staff Testimony of Bruce A. Boger Regarding Licensed Operator Training (CEA Contention No. 13)"	12772
<u>Bonetti, Dennis J.</u>	
"Direct Testimony of Dennis J. Bonetti," (TMIA Contention 5)	3310

<u>Brasher, Jesse W.</u>	
"Licensee's Testimony of Richard Heward, William E. Potts, Ronald A. Knief, Jesse W. Brasher, and Richard Dubiel Regarding CLI-80-5 Issue (4) and Related Board Questions (Health Physics Program)"	16292
<u>Braulke, George R.</u>	
Excerpts from "Licensee's Testimony of Robert W. Keaten, George R. Braulke and George J. Brazill in Response to UCS Contention No. 12, UCS Contention No. 14 and UCS Contention No. 3 (Safety Classification)"	6802
"Licensee's Testimony of George R. Braulke in Response to Board Questions on UCS Contention 12"	6802
<u>Brazill, George J.</u>	
Excerpts from "Licensee's Testimony of Robert W. Keaten, George R. Braulke and George J. Brazill in Response to UCS Contention No. 12, UCS Contention No. 14 and UCS Contention No. 3 (Safety Classification)"	7558
<u>Broughton, T. Gary</u>	
"Licensee's Testimony of Robert C. Jones, Jr. and T. Gary Broughton in Response to UCS Contention No. 8 and ECNP Contention No. 1(e) (Additional LOCA Analysis)"	5038
"Licensee's Testimony of Robert C. Jones, Jr. and T. Gary Broughton in Response to the Board Question on UCS Contention No. 8"	5039
"Licensee's Testimony of T. Gary Broughton, Gerald J. Sadauskas and Luther L. Joyner in Response to Sholly Contention No. 6(a) (Integrated Control System)"	6949
"Licensee's Testimony of T. Gary Broughton, Richard W. Dubiel and Victor H. Willems in Response to Sholly Contention No. 5 and ECNP Contention No. 1(d) (Instrument Ranges (In Plant))"	7509

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APPENDIX B

EXHIBITS

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Board Ex. 2.a.	TMI Nuclear Station Work Request Approval (TMI-19, 2-74)	3740	3740
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Board Ex. 5	Draft, York County Radiological Emergency Response Plan for Incidents at the Three Mile Island Nuclear Power Station, April 14, 1981.	20790	20790
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Board Physical Ex. A	Three Mile Island Nuclear Power Station, Middletown, PA; 50-Mile Radius Area Population Density Map; 1977 Estimate, by Census County Subdivision. July 1980, U.S. Geological Survey	19373	19373
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Lic. Ex. 6	"Small Break in the Pressurizer (PORV) with No Auxiliary Feedwater and Single Failure of the ECCS," Supp. 1 to the May 7, 1979 Small Break Analyses, (May 12, 1979)	5040	5105
Lic. Ex. 7	"Small Break in the Pressurizer (PORV) with No Auxiliary Feedwater and Single Failure of the ECCS with Realistic Decay Heat," Supp. 2 to the May 7, 1979 Small Break Analyses (May 12, 1979)	5041	5105
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Lic. Ex. 9	B&W Document 86-1103585-00 "System Response to Total Loss of SG Heat Sink," (August 7, 1979)	5041	5105
Lic. Ex. 10	Report, "Analysis Summary in Support of an Early RC Pump Trip," (August 21, 1979)	5042	5105
Lic. Ex. 11	"Supplemental Small Break Analysis," Supplement to the August 21, 1979 Analysis in Support of an Early RC Pump Trip (September 12, 1979)	5042	5105
Lic. Ex. 12	B&W Document 69-1106001-00 "Small Break Operating Guidelines," November, 1979	5042	5105
Lic. Ex. 13	B&W Document 86-1117679-000 "Small Break with Failed PORV," (February 11, 1980)	5042	5105
Lic. Ex. 14	Figure 6-1, TMI-1 FSAR "Simplified Schematic Diagram of Engineered Safe- guards System for Core & Building Protection."	5049	5105
Lic. Ex. 15	"TMI Emergency Feedwater System" (except outline)	5643	5645
Lic. Ex. 16	IEEE-279(1971)	6466	6587

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Lic. Ex. 17	Simplified Schematic of TMI Unit 1	6954	16603
Lic. Ex. 18	BAW-1564 "Integrated Control System Reliability Analysis," August, 1979	6988	6988
Lic. Ex. 19	Diagram, Electrical Supply to ICS/NNI System	7010	7022
Lic. Ex. 20	UCS's Answer to Interrogatory 14-1, Licensee's First Set of Interrogatories, March 17, 1980	8131	
Lic. Ex. 21	Excerpt from the Deposition of Robert D. Pollard, April 11, 1980	8232	
Lic. Ex. 22	IEEE Standard 384-1977, "Criteria for Independence of Class 1E Equipment and Circuits"	9112	9481
Lic. Ex. 23	"A Review of the Three Mile Island Unit 1 Control Room from a Human Factors View- point," December, 1980	10235	10236
Lic. Ex. 24	Excerpts from the testimony of Bruce A. Wilson given on May 12, 1980 in the matter of Sacramento Municipal Utility District, Rancho Seco Nuclear Generating Sta- tion, Docket No. 50-312	10852	

<u>EXHIBIT NUMBER</u>	<u>DESCRIPTION</u>	<u>IDENTIFIED AT TRANSCRIPT PAGE</u>	<u>ADMITTED AT TRANSCRIPT PAGE</u>
Lic. Ex. 25	Excerpts from the NRC Staff's Proposed Findings of Fact and Conclusions of Law in the form of an Initial Decision, submitted in the Matter of Sacramento Municipal Utility District, Rancho Seco Nuclear Generating Station, Docket No. 50-312, August 22, 1980	10855	
Lic. Ex. 26-A-K	Statements of Professional Qualifications of the Members of the TMI-1 GORB	12119	12119
Lic. Ex. 27	"Report of TMI-1 Operator Accelerated Retraining Program Review Committee," June 1, 1980	12412	12412
Lic. Ex. 28	"Licensee's Response to Board Questions Concerning 10,000 Gallon Spill at TMI-1 in June, 1980"	13434	13434
Lic. Ex. 29	"Licensee's Response to the Board Question Concerning Maintenance Practices in the Sample Year, 1978"	13661	13661
Lic. Ex. 30	GPU Nuclear Emergency Plan for TMI-1, Revision 3, January 1981	13759	13759

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Lic. Ex. 31	Three Mile Island Nuclear Station, Unit No. 1, Administrative Procedure 1053, Emergency Equipment Readiness, Revision 0, Dated January 7, 1981	14839	14839
Lic. Ex. 32a	Letter dated January 29, 1981 from Bernard J. Snyder, NRC, to Gale Hovey, Metropolitan Edison Co., enclosing Amendment No. 12 to License DPR-73 (Three Mile Island, Unit 2)	15317	15317
Lic. Ex. 32b	Letter dated February 3, 1981 from G.K. Hovey, Metropolitan Edison Co., to Lake Barlett, NRC, regarding reserve waste water tankage for Three Mile Island, Unit 2	15317	15317
Lic. Ex. 33	Letter dated January 21, 1981 from H.D. Hukill, Metropolitan Edison Co., to R.W. Reid, NRC, regarding Human Factors Engineering (response to NUREG-0752)	15547	15547
Lic. Ex. 34	"Operating Reactors 0737 1-1-81 Responses, Status as of 1-09-81"	15968	16040

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Lic. Ex. 35	Letter dated December 1980 from Southern California Edison Co., to D.M. Crutchfield, NRC, Response to NUREG-0737, II.F.2, for San Onofre 1	15970	16040
Lic. Ex. 36	Letter dated January 2, 1981 from W.O. Parker, Duke Power Co., to H.R. Denton, NRC, Response to NUREG-0737, II.F.2, for Oconee 1, 2 and 3	15972	16040
Lic. Ex. 37	Letter dated December 15, 1980 from J.J. Mattimoe, SMUD, to D.G. Eisenhut, NRC, Response to NUREG-0737, II.F.2, for Rancho Seco	15973	16040
Lic. Ex. 38	Letter dated December 30, 1980 from R.P. Crouse, Toledo Edison Co., to D.G. Eisenhut, NRC, Response to NUREG-0737, II.F.2, for Davis-Besse	15973	16040
Lic. Ex. 39	Letter dated December 23, 1980 from R.E. Uhrig, Florida Power & Light Co., to D.G. Eisenhut, NRC, Response to NUREG-0737, II.F.2, for St. Lucie 1	15976	16040
Lic. Ex. 40	Letter dated December 15, 1980, from Baltimore Gas & Electric Co., to D.G. Eisenhut, NRC, Response to NUREG-0737, II.F.2, for Calvert Cliffs 1 and 2	15980	16040

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Lic. Ex. 41	Letter dated December 19, 1980 from Consumers Power Co. to D.M. Crutchfield, NRC, Response to NUREG-0737, II.F.2, for Palisades	15982	16040
Lic. Ex. 42	Letter dated January 5, 1981 from Wisconsin Public Service Corp. to D.G. Eisenhut, NRC, Response to NUREG-0737, II.F.2, for Kewaunee	15984	16040
Lic. Ex. 43	Letter dated July 2, 1980 from L.D. White, Rochester Gas and Electric Corp., to D.M. Crutchfield, NRC, regarding reactor vessel level instrumentation for R.E. Ginna plant	15985	16040
Lic. Ex. 44	Letter dated December 15, 1980 from J.E. Maier, Rochester Gas and Electric Corp., to D.M. Crutchfield, NRC, Response to NUREG-0737, II.F.2, for R.E. Ginna	15985	16040
Lic. Ex. 45	Emergency Procedure 1202-4, Reactor Trip; Revision 20, 3/13/81	16570	16604
Lic. Ex. 46	Emergency Procedure 1202-5, OTSG Tube Leak/Rupture; Revision 11, 2/25/81	16571	

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Lic. Ex. 47	Emergency Procedure 1202-6A, Loss of Reactor Coolant/Reactor Coolant Pressure Within Capability of Makeup System (OC Pressure Above ESAS Setpoint); Revision 8, 3/13/81	16571	16604
Lic. Ex. 48	Emergency Procedure 1202-6B, Loss of Reactor Coolant Pres- sure (Small Break LOCA) Causing Automatic High Pressure Injection; Revision 7, 3/19/81	16571	16604
Lic. Ex. 49	Emergency Procedure 1202-26A, Loss of Steam Generator Feed to Both OTSG's; Revision 12, 3/13/81	16571	16604
Lic. Ex. 50	Emergency Procedure 1202-29, Pressurizer System Failure; Revision 15, 3/13/81	16572	16604
Lic. Ex. 51	Emergency Procedure 1202-39, Inadequate Core Cooling (No LOCA); Revision 4, 3/13/81	16572	16604
Lic. Ex. 52	"Evacuation Time Estimates for the Plume Exposure Pathway EPZ of Three Mile Island Nuclear Generating Facility," 3/3/81	17406	17408

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Commonwealth Ex. 1	Pages 59 through 67, "Three Mile Island, A Report to the Commissioners and to the Public", NRC Special Inquiry Group, Mitchell Rogovin, Director	16194	16200
Commonwealth Ex. 2.a.	Commonwealth of Pennsylvania Disaster Operations Plan, Annex E, Fixed Nuclear Facility Incidents, dated February 23, 1981	17814	17815
	Revised Appendix 7 to the Commonwealth of Pennsylvania Disaster Operations Plan, Annex E, Fixed Nuclear Facility Incidents, dated February 23, 1981	20400	20400
Commonwealth Ex. 2.b.	Map, excerpt of the Commonwealth of Pennsylvania Disaster Operations Plan, Annex E, Fixed Nuclear Facility Incidents, dated February 23, 1981	17814	17815
Commonwealth Ex. 3	Commonwealth of Pennsylvania brochure entitled "Emergency Information: What You Should Know About Nuclear Radiation Incidents", issued 11/79	18072	18208

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Commonwealth Ex. 4	Lancaster County brochure entitled "Emergency In- formation for Lancaster County"	18073	18208
Commonwealth Ex. 5	York County brochure en- titled "Emergency Infor- mation for York County"	18074	18208
Commonwealth Ex. 6	Commonwealth's TMI Fault Tree Procedures	18580	18912
Commonwealth Ex. 7	Dauphin County brochure entitled "Emergency Infor- mation for Dauphin County"	19683	19683
Staff Ex. 1	NUREG-0680, "TMI-1 Re- start Evaluation of Li- censee's Compliance with the Short and Long Term Items of Section II of NRC Order Dated August 9, 1979 Metropolitan Edison Com- pany, et al., Three Mile Island Nuclear Station Unit 1, Docket No. 50-289"	6036	20122
Staff Ex. 2	NUREG-0752, "Control Room Design Review Report for TMI-1"	10453	10454
Staff Ex. 3	"TMI-1 Potential Core Dam- age Accident Sequences and Preventive and Mitigative Measures"	11226	11228

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Staff Ex. 4	NUREG-0680, Supplement No. 1	11941	11941
Staff Ex. 5	NUREG-0760, "Investigation into Information Flow During the Accident at Three Mile Island"	13075	13075
Staff Ex. 6	NUREG-0746, "Emergency Preparedness Evaluation for TMI-1"	15009	15009
Staff Ex. 7	NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"	15010	15010
Staff Ex. 8	NUREG-0696, "Functional Criteria for Emergency Response Facilities" with attached letter dated March 5, 1981 from Darrell G. Eisenhut to all licensees of operating plants and holders of construction permits (Generic Letter No. 17)	15433	15433
Staff Ex. 9	Chart, "Actions Currently Being Implemented at TMI-1 that Address the Substance of the NUREG-0667 Recommen- dations"	15803	15803

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Staff Ex. 10	NUREG-0728, "Report to Congress: NRC Incident Response Plan", September 1980	16109	16110
Staff Ex. 11	Letter dated April 22, 1981 from John F. Stoltz, NRC, to H.D. Hukill, Metropolitan Edison Co., with attached "Safety Evaluation Reports for Items Contained in NUREG-0694 Outside of the Content of the Commission's Orders of August 9, 1979 and March 6, 1980 Required by Restart (October 1981)"	20120	20122
Staff Ex. 12	Letter dated April 22, 1981 from John F. Stoltz, NRC, to H.D. Hukill, Metropolitan Edison Co., with attached "Safety Evaluation Reports for Items Contained in Enclosure 1 to NUREG-0737, Outside of the Scope of the Commission's Orders of August 9, 1979 and March 6, 1980, Required by Restart (October 1981)"	20121	20122
Staff Ex. 13	NUREG-0680, Supplement No. 2	20121	20122
Staff Ex. 14	NUREG-0680, Supplement No. 3	20121	20122

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Staff Ex. 15	NUREG-0752, Supplement No. 1	20123	20123
Aamodt Ex. 1	Memorandum, "Table for Radar Ordinance in a Vertical Plan," dated November 17, 1952	13201	13201
Aamodt Ex. 2	M.S. Aamodt report dated February 15, 1954 regarding dialing errors	13201	13201
Aamodt Ex. 3	Memorandum dated June 30, 1955, "Preference Study of Seven-Digit All Numeral Dialing Used by Subscribers in Actual Telephone Use in their Homes, Case 38933"	13201	13201
Aamodt Ex. 4	Dr. Molholt's Testimony with Appendices 1, 2 and 3 and technical qualifications	14111	REJECTED, 14111
Aamodt Ex. 5	TMI-1 Emergency Plan Procedure No. 1004 (Rev. 1, Sec. 2, 1/16/78), pages 5.0, 6.0, 7.0, 8.0	14704	*

* Aamodt Ex. 5 has not been admitted and will not be admitted until the necessary number of copies are provided. Tr. 14,106.

<u>EXHIBIT NUMBER</u>	<u>DESCRIPTION</u>	<u>IDENTIFIED AT TRANSCRIPT PAGE</u>	<u>ADMITTED AT TRANSCRIPT PAGE</u>
Aamodt Ex. 6	Letter dated April 21, 1981 from Guy R. Hodge to Marjorie Aamodt with attached pages 129-133 and 140 of FEMA report, "Evacuation Planning in the TMI Accident," dated January 1980	20327 20377	REJECTED, 20331
ANGRY Ex. 1	Three Mile Island Public Interest Resource Center document dated October 28, 1980, entitled, "Published Findings Related to the Management Competence of Metropolitan Edison Co."	20653	REJECTED, 20653
ANGRY Ex. 2	Letter dated February 4, 1980 from J.G. Herbein, Metropolitan Edison Co., to B.K. Grimes, NRC, enclosing Pennsylvania DOT evacuation study	13815	
Sholly Ex. 1	December 19, 1979 from D.F. Thatcher Summarizing Meeting of October 23, 1979 regarding the Babcock & Wilcox ICS Reliability Analysis	7124	7124
Sholly Ex. 2	Oak Ridge National Laboratory Review Report.	7099	7124

<u>EXHIBIT NUMBER</u>	<u>DESCRIPTION</u>	<u>IDENTIFIED AT TRANSCRIPT PAGE</u>	<u>ADMITTED AT TRANSCRIPT PAGE</u>
Sholly Ex. 3	EPRI Report NP-1118, "Human Factors Methods for Nuclear Control Room Design," Volume 1, "Human Factors Enhancement of Existing Nuclear Control Rooms," November, 1979	10307	
TMIA Ex. 1	Summary - Work Requests deferred in excess of one year	3313	REJECTED, 3364
TMIA Ex. 2	Summary - major purging of 11/5/79, 11/6/79 & 12/3/79	3313	REJECTED, 3364
TMIA Ex. 3	Summary - 'tacked' Work Requests deferred in excess of one year	3314	REJECTED, 3364
TMIA Ex. 4	Summary - Work Requests not signed-off within one year	3314	REJECTED, 3364
TMIA Ex. 5	Summary - QC/QA not performed within one year	3314	REJECTED, 3364
TMIA Ex. 6	Summary - Ross leak list	3314	
TMIA Ex. 7	Summary - Work Requests cancelled after one year	3314	REJECTED, 3364
TMIA Ex. 8	Work Request 19660	2961	WITHDRAWN, 3023
TMIA Ex. 9	Corrective Maintenance Component History Report	3371	WITHDRAWN, 4133
TMIA Ex. 10	Corrective Maintenance Job Ticket Master Report	3371	WITHDRAWN, 4133

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TMIA Ex. 11	Work Request 21910	3452	
TMIA Ex. 12	Work Request 18471	3477	3494
TMIA Ex. 13	Work Request 23310	3495	3500
TMIA Ex. 14	Work Request 16879	3500- 3501	REJECTED, 3509
TMIA Ex. 15	Work Request 20856	3510	3510
TMIA Ex. 16	Work Request 15350	3521- 3522	3532
TMIA Ex. 17a	Work Request 23579	3545	3578
TMIA Ex. 17b	Work Request 23858	3546	3578
TMIA Ex. 17c	Work Request 24252	3546	3578
TMIA Ex. 17d	Work Request 25056	3546	3578
TMIA Ex. 17e	Work Request 25124	3546	3578
TMIA Ex. 17f	Work Request 25129	3546	3578
TMIA Ex. 18	Work Request 18626	3558	3578
TMIA Ex. 19	Work Request 19590	3578	3580
TMIA Ex. 20	Work Request 22181	3584	3592
TMIA Ex. 21	Work Request 22268	3592- 3593	3602
TMIA Ex. 22	Work Request 25166	3593	3602

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TMIA Ex. 23	Work Request 24246	3617	3620
TMIA Ex. 24a	Work Request C0516	3631	WITHDRAWN, 3638
TMIA Ex. 24b	Work Request 24972	3631	WITHDRAWN, 3638
TMIA Ex. 24c	Work Request 25170	3631	WITHDRAWN, 3638
TMIA Ex. 25	Work Request 23224	3640	REJECTED, 3786
TMIA Ex. 26	Work Request 23814	3642	REJECTED, 3652
TMIA Ex. 27	Work Request 16212	3643- 3644	REJECTED, 3652
TMIA Ex. 28	Work Request 15349	3652	3666
TMIA Ex. 29a	Work Request 20717	3670	REJECTED, 3675
TMIA Ex. 29b	Work Request 21187	3670	REJECTED, 3675
TMIA Ex. 29c	Work Request 25107	3670	REJECTED, 3675
TMIA Ex. 29d	Work Request 24319	3670	REJECTED, 3675
TMIA Ex. 30a	Work Request 22571	3686	WITHDRAWN, 3690
TMIA Ex. 30b	Work Request 22572	3686	WITHDRAWN, 3690
TMIA Ex. 30c	Work Request 22574	3686	WITHDRAWN, 3690
TMIA Ex. 30d	Work Request 22575	3686	WITHDRAWN, 3690

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TMIA Ex. 30e	Work Request 22576	3686	WITHDRAWN, 3690
TMIA Ex. 31	Work Request CO178	3690	3698
TMIA Ex. 32	Work Request 23687	3699	REJECTED, 3704
TMIA Ex. 33a	Work Request 20000	3711	3718
TMIA Ex. 33b	Work Request 20183	3711	3718
TMIA Ex. 33c	Work Request 20332	3711	3718
TMIA Ex. 33d	Work Request 20974	3711	3718
TMIA Ex. 33e	Work Request 21165	3711	3718
TMI* Ex. 33f	Work Request 21587	3711	3718
TMIA Ex. 33g	Work Request 21794	3711	3718
TMIA Ex. 33h	Work Request 22043	3711	3718
TMIA Ex. 33i	Work Request 21769	3711	3718
TMIA Ex. 33j	Work Request 22905	3711	3718
TMIA Ex. 33k	Work Request 23042	3711	3718
TMIA Ex. 33l	Work Request 25149	3711	3718
TMIA Ex. 33m	Work Request C1055	3711	3718
TMIA Ex. 34a	Work Request 20070	3719	3728
TMIA Ex. 34b	Work Request 20139	3719	3728

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TMIA Ex. 34c	Work Request 20254	3719	3728
TMIA Ex. 34d	Work Request 20545	3720	3728
TMIA Ex. 34e	Work Request 20673	3720	3728
TMIA Ex. 34f	Work Request 21060	3720	3728
TMIA Ex. 34g	Work Request 21534	3720	3728
TMIA Ex. 34h	Work Request 21674	3720	3728
TMIA Ex. 34i	Work Request 22064	3720	3728
TMIA Ex. 34j	Work Request 21982	3721	3728
TMIA Ex. 34k	Work Request C0689	3721	3728
TMIA Ex. 35	Work Request 22652	3761	REJECTED, 3773
TMIA Ex. 36	Work Request 17075	3773	REJECTED, 3775
TMIA Ex. 37	Work Request 11850	3778	REJECTED, 3780
TMIA Ex. 38	Work Request 19616	3781	REJECTED, 3786
TMIA Ex. 39	Work Request 23635	3786	3796
TMIA Ex. 40	Work Request 20801	3796	3799
TMIA Ex. 41	Work Request 17915	3799	REJECTED, 3803
TMIA Ex. 42	Work Request 13047 - Misplaced Job Ticket Reconciliation Form	3870	3878

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TMIA Ex. 43a	Work Request 13047	3870	3878
TMIA Ex. 43b	Work Request 24854	3870	3878
TMIA Ex. 44a	L. E. Eberle overtime chart	3939- 3955	3967
TMIA Ex. 44b	C. A. Wynn overtime chart	3955	3967
TMIA Ex. 44c	C. W. Moyer overtime chart	3955	3967
TMIA Ex. 44d	D. E. McCurdy overtime chart	3955- 3956	3967
TMIA Ex. 44e	J. A. Diener overtime chart	3956	3967
TMIA Ex. 44f	M. L. Kuhn overtime chart	3956	3967
TMIA Ex. 44g	T. R. Hipple overtime chart	3956	3967
TMIA Ex. 44h	G. H. Roch overtime chart	3957- 3958	3967
TMIA Ex. 44i	C. E. Newton overtime chart	3956	3967
TMIA Ex. 44j	P. I. Keene overtime chart	3956- 3957	3967
TMIA Ex. 44k	R. E. Wike overtime chart	3957	3967
TMIA Ex. 45	Job Classification listing	3959	3967
TMIA Ex. 46	Explanatory calendar	3960	4130

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TMIA Ex. 47	Summary of Budget Cut Information	4105	4130- 4131
TMIA Ex. 48	Excerpt from Component Maintenance History Computer Summary	4132	4132
UCS Ex. 1	WSAC-1 Equipment and System Action Matrix	4601	4660
UCS Ex. 2	§2.1.2.3, Restart Report, Plant Shielding Review (Amendment 18)	4740	4765
UCS Ex. 3	§2.1.2.3, Restart Report, Plant Shielding Review (Amendment 22)	4741	
UCS Ex. 4	Emergency Procedure 1202-39, Inadequate Core Cooling (Rev. 0, 2/8/80)	4770	1831
UCS Ex. 5	Emergency Procedure 1202-26A, Loss of Steam Generator Feed to Both OTSG's (Rev. 10, 3/4/80)	4781	4831
UCS Ex. 6	Emergency Procedure 1202-6B, Loss of Reactor Coolant/ Reactor Coolant Pressure (Small Break LOCA) Causing Automatic High Pressure Injection (Rev. 3, 10/80)	4782	4831

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UCS Ex. 7	Emergency Procedure 1202-4, Reactor Trip (Rev. 17, 8/27/80)	5339	5340
UCS Ex. 8	Emergency Procedure 1202-6A, Loss of Reactor Coolant Pressure within Capability of Makeup System, (RC Pressure above ESAS Setpoint) (Rev. 4, 8/9/80)	5339	5340
UCS Ex. 9	Page 7.1-7 (Rev. 1) - Table 7-1 from §7.1 of Standard Review Plan	5807	6017
UCS Ex. 10	Letter dated October 25, 1979 from H.R. Denton to Mr. Howell (Consumers Power), 10 C.F.R. 50.54 Request Regarding the De- sign Adequacy of B&W Nuclear Steam Supply Systems Utilizing Once Through Steam Generators (Midland Unit Nos. 1 & 2)	5883	
UCS EX. 11	SECY-80-325A, "Inclusion of Steam Generator Transients As An Unresolved Safety Issue," dated November 7, 1980	6069	
UCS Ex. 12	"Performance Appraisal" of Robert D. Pollard at NRC, dated November, 1975	6408	6411
UCS Ex. 13	Letter dated May 12, 1975 from Loren Stanley to R.B. Minogue, requesting replacement of Pollard on IEEE Subcommittee	6409	6411

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UCS Ex. 14	Memo dated July 11, 1975 from R.D. Pollard to R.W. Klecker, "Comments on Draft IEEE Standard"	6409	6411
UCS Ex. 15	IEEE-603 (1977) (corrected edition)	6412	6586
UCS Ex. 16	IEEE-279 (August 1968)	6419	6587
UCS Ex. 17	Regulatory Guide 1.22 (Safety Guide 22), 2/17/72	6419	6587
UCS Ex. 18	Memo dated April 16, 1979 from S. Hanauer, Environmental Qualification and Instrumenta- tion to Follow Accident	6667	6683
UCS Ex. 19	Emergency Procedure 1202-29 (Rev. 12, 8/27/80), "Pressurizer System Failure"	7865	8010
UCS Ex. 20	Emergency Procedure 1202-5 (Rev. 9, 5/2/80) - OTSG Tube Leak/Rupture	8204	
UCS Ex. 21	Regulatory Guide 1.29, Seismic Design Classification (Revision 2, February 1976)	8707	8705
UCS Ex. 22	Regulatory Guide 1.29, Seismic Design Classification (Revision 3, September 1978)	8707	8709

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UCS Ex. 23	Section 11.2, Standard Review Plan, Liquid Waste Management Systems (Rev. 1)	8707	8709
UCS Ex. 24	Section 11.3, Standard Review Plan, Gaseous Waste Management Systems (Rev. 1)	8708	8709
UCS Ex. 25	Section 11.4, Standard Review Plan, Solid Waste Management Systems (Rev. 1)	8708	8709
UCS Ex. 26	Section 10.4.7, Standard Review Plan, Condensate and Feedwater System (Rev. 1)	8708	8709
UCS Ex. 27	Safety Guide 6, Independence Between Redundant Standby (Onsite) Power Sources and Between Their Distribution Systems	8994	9829
UCS Ex. 28	GPU Service Inter-Office Memorandum, August 11, 1980 from J. Torcivia to C. Hartman, Emergency Procedure 1202-29, Pressurizer System Failures	9228	9340
UCS Ex. 29	Regulatory Guide 1.75 (Rev. 2, 9/78), Physical Independence of Electric Systems	9608	9829
UCS Ex. 30	Restart Report, pages 2.1-6 through 2.1-7c, hand-marked "Pressurizer Heaters - Word Changes - Amendment 22"	9610	9829

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UCS Ex. 31	Regulatory Guide 1.63 (Rev. 2, 7/78), "Electric Penetration Assemblies in Containment Structures for Light-Water-Cooled Nuclear Power Plants" and July, 1978 memo from R.B. Minogue.	9752	9829
UCS Ex. 32	Letter dated December 11, 1980 from M. Plesset, ACRS, to Chairman J. Ahearne, NRC, re TMI-1 Restart.	16879	16885