

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

In the Matter of

METROPOLITAN EDISON COMPANY, et al.

(Three Mile Island Nuclear Station,  
Unit 2)

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Docket No. 50-320 OLA

MODIFICATION OF ORDER

I.

Metropolitan Edison Company, Jersey Central Power and Light Company and Pennsylvania Electric Company (collectively, the Licensee) are the holders of Facility Operating License No. DPR-73, which had authorized operation of the Three Mile Island Nuclear Station, Unit 2 (TMI-2) at power levels up to 2772 megawatts thermal. The facility, which is located in Londonderry Township, Dauphin County, Pennsylvania, is a pressured water reactor previously used for the commercial generation of electricity.

By Order for Modification of License, dated July 20, 1979, the Licensee's authority to operate the facility was suspended and the Licensee's authority was limited to maintenance of the facility in the present shutdown cooling mode (44 F.R. 45271). By further Order of the Director, Office of Nuclear Reactor Regulation, dated February 11, 1980, a new set of formal license requirements were imposed to reflect the post-accident condition of the

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facility and to assure the continued maintenance of the current safe, stable, long-term-cooling condition of the facility (45 F.R. 11282). These requirements, in the form of proposed Technical Specifications, would modify the facility operating license so as to:

- (1) define operating parameters for the current safe, stable, long-term cooling mode for the facility (defined as the recovery mode), and delete all other permissible operating modes so as to assure that operation of the facility in other than the stable shutdown condition of the recovery mode is precluded;
- (2) impose functional, operability, redundancy and surveillance requirements as well as safety limits and limiting conditions with regard to those structures, systems, equipment and components necessary to maintain the facility in the current safe, stable shutdown condition and to cope with foreseeable off-normal conditions;
- (3) prohibit venting or purging or other treatment of [the approximately 57,000 curies of krypton-85 in] the reactor building atmosphere, the discharge of water decontaminated by EPICOR-II system, and the treatment and disposal of high-level radioactively contaminated water in the reactor building, until each of these activities has been approved by the NRC,<sup>1/</sup> consistent with the Commission's Statement of Policy and Notice of Intent to Prepare a Programmatic Environmental Impact Statement (44 F.R. 67738).

On the basis of the public health, safety, and interest, the requirements of the proposed Technical Specifications, attached to the February 11, 1980 Order, were made effective immediately. Under the terms of the Order, the proposed formal license amendment incorporating these proposed Technical Specifications will become effective on the expiration of the period specified in the

<sup>1/</sup> By Memorandum and Order, dated June 12, 1980, the Commission gave the approval contemplated by this restriction insofar as necessary for the licensee to conduct a purging of the TMI-2 containment in accordance with procedures approved by the NRC. CLI-80-25. This activity was completed on July 11, 1980.

Order, during which the Licensee or any other person whose interest may be affected may request a hearing or, in the event a hearing is requested and granted, on the date specified in an order made following the hearing or other disposition of such proceeding.

Several requests for a hearing have been filed in connection with the Order. These requests are pending before an Atomic Safety and Licensing Board established to rule on such requests and to preside over the proceeding in the event that a hearing is ordered. It is expected that, during the pendency of this matter, a number of changes in the proposed Technical Specifications may become necessary as the plant status continues to evolve as a result of ongoing decontamination and maintenance efforts. This Modification of Order addresses the first such change as discussed below.

## II.

Following the March 28, 1979 accident at TMI-2, it became apparent that the preferred cooling modes for the reactor included the use of a significant amount of plant equipment (e.g. condensate booster pumps and circulating water pumps) that did not have access to back-up power supplies. This was also true for the plant modifications proposed to provide alternate methods of core cooling. Therefore, in order to provide back-up power capability to these core cooling systems, two additional balance-of-plant (BOP) diesel generators and a separate external 13.2 kv transmission line were installed at the site. These provided sources of power in addition to the 230 kv lines and the onsite emergency diesels which were available before the



March 28, 1979 accident. Operability requirements for these additional BOP diesel generators and the 13.2 kv transmission line were included in paragraph 3.8.1.1 of the proposed Technical Specifications which were imposed pursuant to the Director's Order of February 11, 1980.

By letter, dated April 28, 1980, the Licensee requested NRC approval of proposed design changes which would allow the removal of the two BOP diesel generators and the 13.2 kv transmission line. The proposed changes would utilize the same combustion turbines, located in the proximity of Three Mile Island, that now provide the back-up power source via the 13.2 kv line. Under this proposal, the 230 kv grid system would be utilized instead of the 13.2 kv line (via the 115 kv grid system). This new configuration means re-energizing a portion of the 230 kv grid system (that which normally feeds offsite power to TMI) by use of the combustion turbines. This eliminates the need to switch to other sources and can be accomplished well before any need for restoration of motive power would exist. The onsite emergency diesels, which could, if necessary, provide an adequate source of power, will continue to be available.

It has been determined that the Licensee's proposal would provide an overall upgrade in loss-of-offsite-power protection as compared to that afforded by the approved existing system. This upgrade is realized in the following ways: (1) unlimited versus limited capacity; (2) operator action consists of coordination with system dispatcher only versus also dispatching operators to man the BOP diesels; (3) proven reliability of the 230 kv grid and its

components versus the unproven non-Class 1E diesel generators; and (4) familiarity with existing equipment versus new equipment never tested/operated in the actual mode required given loss of offsite power. (This is due to the fact that no testing is allowed which could even possibly provide a perturbation in the core cooling function.) As a consequence, the immediate need for the two BOP diesel generators and the 13.2 kv transmission lines found present in the Director's February 11, 1980 Order has been eliminated. The Staff's safety assessment of this matter is set forth in the concurrently issued Safety Evaluation. This evaluation concluded, in material part, that the modification does not involve a significant hazards consideration and that there is reasonable assurance that the health and safety of the public will not be endangered by operation in the modified manner.

It was further determined that the modification does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. In light of this determination, it was concluded that the instant action is insignificant from the standpoint of environmental impact and, pursuant to 10 C.F.R. § 51.5(d)(4), that an environmental impact statement or environmental impact appraisal need not be prepared herewith.

### III.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, IT IS ORDERED THAT:

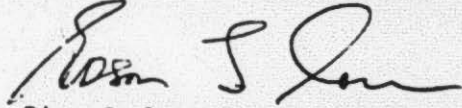
(1) Effectively immediately, the requirements imposed by the Director's Order of February 11, 1980 are modified by revision of paragraph 3.8.1.1 of the proposed Technical Specifications attached thereto to delete subparts (c) and (d) and to make corresponding revisions in explanatory portions of that paragraph as set forth in Attachment A hereto.

The formal license amendment incorporating the proposed Technical Specifications, as modified, must await the outcome of the prospective hearing requested pursuant to the February 11, 1980 Order or other disposition of that matter. For further details with respect to this action, see (1) Letter to B. J. Snyder, NRC, from R. C. Arnold, Met.Ed/GUP, "Technical Specification Change Request No. 22," dated April 28, 1980; (2) Letter to J. T. Collins, NRC, from R. F. Wilson, Met. Ed/GUP, requesting removal of the two BOP diesel generators, dated March 4, 1980; (3) Letter to R. C. Arnold, Met. Ed, from J. T. Collins, NRC, granting approval of the concept for removal of the BOP diesel generators, dated March 28, 1980; (4) Letter to J. T. Collins, NRC, from R. F. Wilson, Met. Ed/GUP, requesting removal of 13.2 kv power line, dated March 28, 1980; and (5) the Director's Order of February 11, 1980. All of the above documents are available for inspection at the Commission's Public Document Room, 1717 H Street, N. W., Washington, D. C., and at the Commission's Local Public Document Rooms at the State Library of Pennsylvania, Government Publications Section, Education Building, Commonwealth and Walnut



Streets, Harrisburg, Pennsylvania 17126 and of the York College of Pennsylvania,  
Country Club Road, York, Pennsylvania. ;

FOR THE NUCLEAR REGULATORY COMMISSION -



Edson G. Case, Deputy Director  
Office of Nuclear Reactor Regulation

Dated at Bethesda, Maryland

AUG 11 1980

LIMITING CONDITIONS FOR OPERATION3.8 ELECTRICAL POWER SYSTEMS3.8.1 A.C. SOURCES

3.8.1.1 As a minimum, the following A.C. electrical power sources shall be OPERABLE:

- a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system.
- b. Two separate and independent Class 1E diesel generators each with:
  1. A separate day fuel tank containing a minimum volume of 500 gallons of fuel.
  2. A separate fuel storage system containing a minimum volume of 19,000 gallons of fuel.
  3. A separate fuel transfer pump.

APPLICABILITY: RECOVERY MODE.

ACTION:

- a. With either an offsite circuit or diesel generator of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1 and 4.8.1.1.2.a.4 in accordance with the applicable row in the Testing Frequency Matrix of Table 3.8-1; restore the full complement of the above required A.C. electrical power sources to OPERABLE status within 72 hours, except when performing the Annual Preventive Maintenance Outage at which time 7 days shall be allowed.
- b. With one offsite circuit and one diesel generator or two offsite circuits or two diesel generators of the above required A.C. electrical power sources inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirements 4.8.1.1.1 and 4.8.1.1.2.a.4 in accordance with the applicable two rows in the Testing Frequency Matrix of Table 3.8-1; restore at least one of the inoperable sources to OPERABLE status in accordance with the Restoration Time Matrix of Table 3.8-2. Restore the full complement of the above required A.C. electrical power sources to OPERABLE status within 72 hours from the time of initial loss.



**TABLE 3.8-1**

**TESTING FREQUENCY MATRIX**

		Component Testing Frequencies			
		a <sub>1</sub>	a <sub>2</sub>	b <sub>1</sub>	b <sub>2</sub>
Inoperable Component	a <sub>1</sub>	X	*	*	*
	a <sub>2</sub>	*	X	*	*
	b <sub>1</sub>	*	*	X	*
	b <sub>2</sub>	*	*	*	X

Key: \*Within 4 hours and every 12 hours thereafter  
a<sub>1</sub> Offsite power circuit No. 1  
a<sub>2</sub> Offsite power circuit No. 2  
b<sub>1</sub> Class 1E diesel generator (Red)  
b<sub>2</sub> Class 1E diesel generator (Green)

**TABLE 3.8-2**  
**RESTORATION TIME MATRIX**

		Restore One Component (Hours)	Restore Other Component (Hours)
Combination of Two Inoperable Components	aa	24	72
	ab	12	72
	bb	12	72

Note: a and b above correspond to components described in Specification 3.8.1.1 items a and b respectively.

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

DOCKET NO. 50-320

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 2

Introduction

By letter dated April 28, 1980 (Reference 1), the Metropolitan Edison Company (licensee) proposed changes to the Recovery Mode technical specifications for Three Mile Island Unit 2 (TMI-2) dealing with the Balance of Plant (BOP) diesel generators and the 13.2 kv circuit from the Middletown Junction Substation. The proposed changes would remove the operability requirements for the BOP diesel generators and the 13.2 kv circuit imposed by the Order of the Director of the Office of Nuclear Reactor Regulation on February 11, 1980, (45 F.R. 11282) in the form of proposed Technical Specifications and would change the allowable out-of-service time for the Class 1E diesel generators to allow adequate time for the performance of the manufacturer's recommended annual preventive maintenance operations.

Following the March 28, 1979, accident at TMI-2, it became apparent that the preferred cooling modes for the reactor included the use of a significant amount of plant equipment that did not have access to back-up power supplies. This was also true for the plant modifications proposed to provide alternate methods of core cooling. Therefore, in order to provide back-up power capability to these core cooling systems, two additional diesel generators and a separate external 13.2 kv



transmission line were installed at the site. A description of these alternate core cooling modes and associated systems and back-up power supplies as well as the staff's safety evaluation can be found in Appendix B to NUREG-0557 "Evaluation of Long-Term Post-Accident Core Cooling of Three Mile Island Unit II." The operability requirements for these additional diesel generators and the 13.2 kv transmission line were imposed by the Director's Order of February 11, 1980.

#### Summary

The licensee has requested NRC staff approval of proposed design changes which would allow the removal of the two BOP diesel generators and the 13.2 kv transmission line. The proposed changes would utilize the same combustion turbines, located in the proximity of Three Mile Island, that now provide the back-up power source via the 13.2 kv line. The difference being that the 230 kv grid system would be utilized instead of the 13.2 kv line (via the 115 kv grid system). We have found that the licensee's proposal provides an equivalent degree of protection as that afforded by the approved existing system and have therefore granted their request to modify the existing system accordingly.

#### Evaluation

The TMI-2 BOP power system was devised as a short-term solution to the problem of providing loss-of-offsite-power protection for three non-safety related 4160 volt busses. These busses (i.e. 2-3, 2-4, and 2-5) were selected because of existing loads as well as their capacity for new loads that would be required in the various

proposed alternate methods of core cooling. The licensee proposed the existing system to fulfill the loss-of-offsite-power protective function. The existing system has a dedicated non-Class 1E diesel generator for bus 2-3 (Gray System) and another for bus 2-4 (White System). The major load required on bus 2-5 is the 2250 horsepower circulating water pump. Given a loss of offsite power, the starting requirements of this motor were such that a sufficiently sized additional diesel generator was not a viable short-term option. The licensee therefore proposed the use of local combustion turbines with black-start capability and a new low voltage (13.2 kv) transmission line to bring the power to the site.

Upon a year's reflection and accompanying engineering analyses of the BOP power system (as currently structured), the licensee has proposed a new BOP power system configuration. This new configuration replaces the two BOP diesel generators and the 13.2 kv transmission line with the existing 230 kv grid system. This means re-energizing a portion of the 230 kv grid system (that which normally feeds offsite power to TMI) by use of the combustion turbines. This eliminates the need to switch to other sources and can be accomplished well before any need for restoration of motive power would exist.

This proposed design change places no new restrictions on the required BOP in-plant loads beyond any that now exist and, in fact, provides an overall upgrade in loss-of-offsite-power protection. This upgrade is realized in the following ways:

1. unlimited versus limited capacity,
2. operator action consists of coordination with system dispatcher only versus also dispatching operators to man the BOP diesels,

3. proven reliability of the 230 kv grid and its components versus the unproven non-Class 1E diesel generators, and
4. familiarity with existing equipment versus new equipment never tested/operated in the actual mode required given loss of offsite power. (This is due to the fact that no testing is allowed which could even possibly provide a perturbation in the core cooling function.)

The licensee's proposal to use three separate, redundant and independent sets of combustion turbines (by priority) located in three separate geographical locations and the 115/230 kv grid configuration which allows multiple transmission paths from each generating site to the TMI switchyard (all under remote supervisory control of the grid system dispatcher) provides a system that assures the timely reinstatement of power to the TMI site absent major physical destruction of the transmission system. The postulation of such major physical damage goes well beyond the required design bases of such systems and is therefore not considered further in this evaluation.

The subject of modifying the TMI-2 BOP power system was first presented to the staff in Reference 2. This request concerned only removal of the BOP diesel generators and thereby required physical modification to the onsite distribution system to allow the 13.2 kv line to provide power to all three BOP buses. Our evaluation of this proposal is documented in Reference 3 in which we found the concept acceptable but required additional details of the in-plant modifications in order to give final approval. Reference 4 expanded the licensee's modification request to include the 13.2 kv line. This would be done in such a manner that the modification to the



onsite distribution system would no longer be needed (i.e. the design configuration herein evaluated). Therefore, we conclude that the Reference 2 request and the Reference 3 set of questions are superseded and replaced by Reference 4 and this evaluation and that nothing further is required.

As part of our systems review of this proposed design modification, we requested two sets of procedures be included in the licensee's submittal. The two sets of procedures include the TMI-2 Emergency Procedure 2202-2.1 Station Blackout and four grid system dispatcher procedures covering two different paths for the preferred source of back-up power and one each for the second and third priority sources. Procedure 2202-2.1 has been reviewed and approved pursuant to the requirements of proposed Technical Specification 6.8.2. The four grid dispatcher procedures are not covered by the above formal program; however, we have reviewed these procedures and have found them to be acceptable.

We have reviewed the revisions to the proposed Technical Specification and have concluded that they accurately reflect the modified system, are consistent with existing requirements to provide back-up power capability and also provide for an annual maintenance program for the diesel generators that was inadvertently left out of the existing requirements. We, therefore, find the proposed Technical Specifications to be acceptable and require that they become effective coincident with the removal of the BOP diesel generators and the 13.2 kv transmission line.

#### Environmental Consideration

We have determined that the modification does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further

concluded that the modification involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR Section 51.5(d) (4), ; that an environmental impact statement or negative declaration and environmental - impact appraisal need not be prepared in connection with the issuance of this modification.

Conclusion

Based upon our review of BOP power system modification, the attendant Technical Specifications and emergency procedures, and our findings that the proposed system provides an overall upgrade in loss-of-offsite-power protection, we find the licensee's request to be acceptable and grant the request to make said modifications. The measures authorized in connection with this evaluation will assure the continued maintenance of the facility in a safe, stable, long-term cooling condition, as discussed above. Based on these considerations, we have concluded that: (1) the modification does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the modified manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this modification will not be inimical to the common defense and security or to the health and safety of the public.

REFERENCES

1. Letter to B. J. Snyder, USNRC, from R. C. Arnold, Met. Ed/GPU, Technical Specification Change Request No. 22, dated April 28, 1980, (TLL 186).
2. Letter to J. T. Collins, USNRC, from R. F. Wilson, Met. Ed/GPU, requesting removal of the two BOP diesel generators, dated March 4, 1980.
3. Letter to R. C. Arnold, Met. Ed, from J. T. Collins, USNRC, granting approval of the concept for removal of the BOP diesel generators, dated March 28, 1980.
4. Letter to J. T. Collins, USNRC, from R. F. Wilson, Met. Ed/GPU, requesting removal of 13.2 kv power line, dated March 28, 1980.