



A PECO Energy/British Energy Company

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Three Mile Island Unit 1

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October 20, 2000

5928-00-20254

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Dear Sir or Madam:

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1),
OPERATING LICENSE NO. DPR-50
DOCKET NO. 50-289
TECHNICAL SPECIFICATION CHANGE REQUEST NO. 296
EMERGENCY DIESEL GENERATOR MAINTENANCE

In accordance with 10 CFR 50.4 (b) (1), enclosed is Technical Specification Change Request No. 296 to bring maintenance inspections on the Emergency Diesel Generator (EDG) to a two year cycle. This maintenance interval is in conformance with guidelines of the Fairbanks Morse Owners Group (FMOG) and the manufacturer.

The purpose of this Technical Specification Change Request is to request that the TMI-1 Technical Specifications Section 4.6.1.c be revised to extend emergency diesel generator maintenance to a two-year frequency in accordance with owner's group and manufacturer's recommendations. This change will result in a change in frequency from the current annual (one-year) requirement for the maintenance inspection outage to a 24 month (two-year) frequency to coincide with the next emergency diesel generator outage. AmerGen requests that, if approved, the amendment to the TMI-1 Technical Specifications be issued by March 31, 2001 and become effective within 30 days of issuance.

This request is similar to the requests from several licensees and is most similar to the submittal of Limerick Generating Station as follows:

Calvert Cliffs Units 1/2	Submitted 11/02/93	Approved 9/27/94
Limerick Units 1/2	Submitted 01/25/99	Approved 7/29/99
Millstone 3	Submitted July 2000	Approval pending
North Anna Units 1/2	Submitted 09/01/95, 04/08/96,	Approved 08/26/98
	04/22/96	

Based on FMOG discussions, the referenced plants have not experienced negative consequences due to the implementation of the 24-month maintenance frequency. Similarly, the inspection

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results of the TMI EDGs are consistent with the FMOG recommendations to extend the inspection frequency to 24 months.

Pursuant to 10 CFR 50.91 (a) (1), enclosed is our analysis, applying the standards in 10 CFR 50.92 to make a determination of no significant hazards considerations. As stated above, pursuant to 10 CFR 50.91(a), we have provided a copy of this letter, the proposed changes in the Technical Specifications, and our analyses of no significant hazards considerations to the designated representative of the Commonwealth of Pennsylvania. This information is being submitted under affirmation, and the required affidavit is enclosed.

Very truly yours,



Mark E. Warner
Vice President, TMI Unit 1

MEW/vlk

Enclosures: (1) Technical Specification Change Request No. 296
(2) Technical Specification Markup

cc: Administrator Region I
TMI Senior Resident Inspector
TMI-1 Project Manager
Chairman, Board of Supervisors, Londonderry Township, Dauphin County, Pennsylvania
Board of County Commissioners, Dauphin County, Pennsylvania
Pennsylvania Department of Environmental Resources, Bureau of Radiation Protection

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ENCLOSURE 1

TECHNICAL SPECIFICATION CHANGE REQUEST NO. 296
AND NO SIGNIFICANT HAZARDS CONSIDERATION ANALYSIS

- I. AmerGen requests that Technical Specifications Section 4.6.1.c be changed as proposed in the marked up page shown in Enclosure 2.

II. REASON FOR CHANGE WITH BRIEF DESCRIPTION OF CHANGE

The requested Technical Specification change addresses a Technical Specification statement that requires the Emergency Diesel Generators (EDGs) to be subjected to a maintenance inspection annually. The requested change will result in a frequency from the current annual (12-month) requirement for the maintenance inspection outage to a 24-month frequency. The change is in accordance with the manufacturer's approval and the Fairbanks Morse Owners Group (FMOG) maintenance recommendations.

The frequency change for the Emergency Diesel Generators inspections is based on the implementation of a comprehensive new program entitled "Recommended Maintenance for Opposed Piston Diesel Engines in Nuclear Standby Service," Revision 0, dated September 18, 1997. This program was developed by the FMOG to establish a consistent framework for the expected maintenance activities to be performed. The recommendations include common tasks for the entire nuclear opposed piston diesel generator population. The recommendations were reviewed in detail and endorsed by BF Goodrich/Fairbanks Morse Engine Division, the original equipment manufacturer (OEM). The activities performed at the specified frequencies defined in the program constitute a complete package for maintaining emergency diesel generator reliability.

The current procedures and practices at TMI-1 are already closely aligned with the FMOG program. The FMOG recommendations and the TMI procedures and tasks were compared as part of a detailed engineering evaluation. New tasks that were identified for implementation will be processed in conjunction with the approval of the proposed technical specification change.

The emergency diesel generator units at TMI-1 utilize a closed loop glycol system for jacket water-cooling. This system is self contained and not subjected to harsh water conditions (bases for Recommendations 18, 68, and 69) that would cause accelerated fouling or corrosion. Therefore, TMI will continue to sample jacket water annually rather than quarterly (FMOG Recommendation 18) and replacement of heat exchanger zinc anodes is not applicable (FMOG Recommendations 68 and 69).

The new FMOG recommendations and preventative maintenance program is structured to increase EDG reliability and availability. It also facilitates early identification of developing problem areas. The program incorporated engineering input and industry experience during the development of the recommendations. TMI-1 was an active and key participant in the development of the FMOG Recommendations. The maintenance history and service conditions of the TMI-1 EDGs were specifically considered during the development of the Recommendation Details; therefore, the TMI-1 EDGs are within the bounding assumptions.

Future additional recommendations originating from either the FMOG or manufacturer will be reviewed for applicability. Implementation, where applicable, will be performed using standard evaluation and approval processes.

III. SAFETY ASSESSMENT

The EDG is a stand-by safety system. The EDG's are started and loaded in response to specific plant events (For example, loss of off-site power, loss of auxiliary transformer, and engineered safeguards actuation signals). The EDGs are part of the safe shutdown equipment as the emergency power source. A change to the maintenance interval will have no effect on the design and capability of the EDGs to meet the requirement to supply safe shutdown equipment power during specified plant events.

Over the remaining life of the plant, the change will result in a 50% reduction of the total number of intrusions into the EDG's for the purpose of inspection. The reduction in the number of EDG outages will reduce the opportunity for introduction of equipment reliability problems due to human error, defective consumable items and foreign material (FME) intrusion. This change is consistent with past studies on age-related failures of EDG's. For example, Hoopingarner & Zaloudek state in their study (Aging Mitigation and Improved Programs for Nuclear Service Diesel Generators. Pacific Northwest Laboratory for the US Nuclear Regulatory Commission, NUREG/CR 5057, December, 1989) of the subject:

“... One important recommendation is that teardown of the diesel engines solely for the purpose of inspection should be avoided unless there is a definite indication that its operation is degraded or there is an impending component failure based on performance data trends. Analysis of failure data have also been performed by the U.S. Navy and the airline industry which show a definite average, short-term adverse effect of such teardowns on the engine reliability.”

The original maintenance requirements required by the manufacturer were based on commercial service units where yearly operational time exceeded 2000 hours and reached as high as 8700 hours. Nuclear EDG service involves mostly standby time interrupted by periodic testing. In the early years at TMI-1, the EDG's were subjected to routine “cold fast starts”; i.e. demonstrating fast starts from ambient conditions with rapid application of electrical loads to meet testing criteria. The practice of cold fast starts was applied multiple times each month. The engine starts were often conducted in the absence of an engine pre-lube that accelerates wear, tear and degradation of the engine components. Based on this type of testing, the annual inspections were justified to ensure reliability. Cold fast starts have been eliminated at TMI-1 with the exception of the refueling surveillance where fast start, block loading, and load rejection capabilities are verified.

The Maintenance Rule Program utilizes a formal process for identifying functional failures, adverse trends, and other techniques to identify the cause of system component failures or degradation. The Maintenance Rule also implements a tracking system for unavailability and reliability. This program places a focus on improving system operability using various techniques that help predict eminent failures. The program also provides the plant with the ability to track planned maintenance periods and corrective maintenance to determine the overall health of the corresponding systems.

The testing, system, and program improvements implemented at TMI-1 over the past ten years have resulted in improved reliability and availability for the EDG's. The plant is

also supported by a corrective action program to ensure an appropriate level of review, investigation and resolution is performed when problems occur. The reduced number of EDG starts, lower EDG operating hours, improved nuclear service operating conditions, and the implementation of the FMOG Maintenance Recommendations, provide the bases to increase the maintenance interval from annual to 24 months. The improved operating conditions were a consideration of the FMOG in developing the periodicity recommendations in the standard document. The FMOG program will add to TMI-1's current practices and further ensure EDG reliability and availability.

This change is consistent with industry developed and OEM endorsed recommended maintenance program. The maintenance improvements to be incorporated as a result of this new program, coupled with the trending of data are structured to improve the reliability and facilitate early, non-intrusive identification of developing problem areas. A reduction in the number of diesel outages will also reduce the possibility of introducing problems resulting from human error or foreign material intrusion. Extending the maintenance interval should reduce the two-year unavailability from about 2% to about 1.4%. This is an approximate 30% reduction in unavailability. An extension of the outage inspection frequency to 24 months will result in increased EDG availability to mitigate the consequences of a potential accident. When this program is taken in its entirety, the extended maintenance intervals, coupled with the defined enhancements, is judged to result in an overall increase in nuclear plant safety, as well as significant cost savings.

The extension does not have any affect on the current testing surveillance schedule; therefore, periodic verification of EDG capability remains in place to identify degrading conditions, verify operability and ensure the EDG's meet accident response criteria.

The current grace period of 25% of the maintenance interval will remain in affect with 24-month inspections. The OEM concurs with this grace period.

The impact of the proposed changes on the availability of equipment or systems required to mitigate the consequences of an accident, if any, is small based on the elimination of approximately one week of unavailability per EDG. Each of the TMI-1 EDG's is capable of carrying full accident loads on the respective vital ES bus. Each ES bus powers a train of emergency equipment and provides for redundancy of the opposite bus. Because of the system and plant redundancy, and the fact that any significant failures of the EDG's or associated components would be detected during monthly surveillance testing, the impact on system availability from the proposed changes is small, if any. The EDG unavailability time for these proposed changes will decrease due to the interval increase, thus resulting in increased EDG availability to mitigate the consequences of a potential accident.

IV. NO SIGNIFICANT HAZARDS ANALYSIS

AmerGen has determined that this Technical Specification proposed change poses no significant hazards consideration as defined by 10 CFR 50.92.

1. *Operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.*

The changes do not affect the ability of the Emergency Diesel Generators (EDGs) to mitigate the consequences of an accident, including the loss of coolant accident coupled with loss of offsite power accident, which would be considered the most demanding on the EDG System and components. A reduction in the number of diesel outages will also reduce the possibility of introducing problems resulting from human error or foreign material intrusion. Extending the maintenance interval should reduce the two-year unavailability from about 2% to about 1.4%. This is an approximate 30% reduction in unavailability. An extension of the outage inspection frequency to 24 months will result in increased EDG availability to mitigate the consequences of a potential accident. When this program is taken in its entirety, the extended maintenance intervals, coupled with the defined enhancements, is judged to result in an overall increase in Emergency Diesel Generator availability and reliability. The surveillance testing requirements of Technical Specifications Section 4.6.1.a & b will continue to verify the operability and reliability of the EDG System. Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any previously evaluated.*

The Emergency Diesel Generator System is not an accident initiator. The operation, testing, and design of the Emergency Power System (including the Emergency Diesel Generators) is not being changed. The maintenance inspection interval is being expanded from annual to two years and will improve availability, and enhance reliability. Plant design requires the full load capability of one Emergency Diesel Generator to support accident loads and the respective emergency electrical busses. Performance of the maintenance inspection on the extended interval will not have an adverse affect on the ability of the Emergency Diesel Generators to meet the design response criteria or contribute to the occurrence or the consequences of an accident. The proposed changes do not involve any physical design or operational changes that could create a malfunction extending beyond an individual Emergency Diesel Generator, nor does it increase the potential for a common-mode Emergency Diesel Generator failure. Therefore, operation of the facility in accordance with the proposed amendment would not create the possibility of a new or different kind of accident from any previously evaluated

3. *Operation of the facility in accordance with the proposed amendment would not involve a significant reduction in the margin of safety.*

The change of the maintenance inspection frequency and the detailed programmatic changes that implement the Fairbanks Morse Owners Group recommendations, will increase the availability and the reliability of the Emergency Diesel Generators. Based on improving the availability and reliability, the margin of safety will actually be enhanced. The amount of time the Emergency Diesel Generators are out-of-service during on-line maintenance will decrease, thereby reducing the number of plant operating hours that the unit is exposed to a single mode failure. Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant reduction in the margin of safety.

Based upon the analysis provided herein, the proposed change meets the requirements of 10 CFR 50.92(c) and involves no significant hazards consideration.

V. INFORMATION SUPPORTING AN ENVIRONMENTAL ASSESSMENT

An environmental assessment is not required for the changes proposed by this technical specification change request because the requested changes to Three Mile Island Nuclear Generating Station, Unit 1 conform to the criteria for "actions eligible for categorical exclusion," as specified in 10 CFR 51.22(c)(9). The requested changes will have no impact on the environment. The proposed changes do not involve a significant hazards consideration as discussed in the preceding section. The proposed changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

ENCLOSURE 2

TECHNICAL SPECIFICATION MARKUP

Applicability: Applies to periodic testing and surveillance requirement of the emergency power system.

Objective: To verify that the emergency power system will respond promptly and properly when required.

Specification:

The following tests and surveillance shall be performed as stated:

4.6.1 Diesel Generators

- a. Manually-initiate start of the diesel generator, followed by manual synchronization with other power sources and assumption of load by the diesel generator up to the name-plate rating (3000 kw). This test will be conducted every month on each diesel generator. Normal plant operation will not be effected.
- b. Automatically start and loading the emergency diesel generator in accordance with Specification 4.5.1.1.b/c including the following. This test will be conducted every refueling interval on each diesel generator.
 - (1) Verify that the diesel generator starts from ambient condition upon receipt of the ES signal and is ready to load in ≤ 10 seconds.
 - (2) Verify that the diesel block loads upon simulated loss of offsite power in ≤ 30 seconds.
 - (3) The diesel operates with the permanently connected and auto connected load for ≥ 5 minutes.
 - (4) The diesel engine does not trip when the generator breaker is opened while carrying emergency loads.
 - (5) The diesel generator block loads and operates for ≥ 5 minutes upon reclosure of the diesel generator breaker.

ALLOWABLE GRACE PERIOD) Each diesel generator shall be given an inspection at least ^{EVERY 24 MONTHS (WITH A 25%} ~~annually~~ in accordance with the manufacturer's recommendations for this class of stand-by service.

4.6.2 Station Batteries
FAIRBANKS MORSE OWNERS GROUP AND

- a. The voltage, specific gravity, and liquid level of each cell will be measured and recorded:
 - (1) every 92 days
 - (2) once within 24 hours after a battery discharge < 105 V
 - (3) once within 24 hours after a battery overcharge > 150 V
 - (4) If any cell parameters are not met, measure and record the parameters on each connected cell every 7 days thereafter until all battery parameters are met.
- b. The voltage and specific gravity of a pilot cell will be measured and recorded weekly. If any pilot cell parameters are not met, perform surveillance 4.6.2.a on each connected cell within 24 hours and every 7 days thereafter until all battery parameters are met.
- c. Each time data is recorded, new data shall be compared with old to detect signs of abuse or deterioration.