



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 210 TO FACILITY OPERATING LICENSE NO. NPF-3

TOLEDO EDISON COMPANY

CENTERIOR SERVICE COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

1.0 INTRODUCTION

By letter dated April 18, 1996, the Toledo Edison Company, Centerior Service Company, and The Cleveland Electric Illuminating Company (the licensees), submitted a license amendment request for NRC review and approval for the Davis-Besse Nuclear Power Station (DBNPS), Unit 1. The license amendment would allow the use of the station black out diesel generator in lieu of the emergency diesel generator associated with decay heat removal loop No. 1 during the tenth refueling outage as long as the provisions discussed in the evaluation below are followed. If more than 7 days are required in this configuration, the licensees will communicate to the NRC their plans to continue reliance on the SBODG or EDG-2 to supply emergency power to decay heat removal loop No. 1.

2.0 EVALUATION

The DBNPS is currently in a shutdown refueling condition (Mode 6) for the tenth refueling outage. Prior to relying on emergency diesel generator (EDG) No. 1 to support operable decay heat removal (DHR) equipment during the current refueling outage, previously identified EDG No. 1 start time trends were investigated. As a result of this investigation, a load imbalance in the generator poles was discovered. Therefore, the generator was shipped offsite on April 15, 1996, to be reworked, leaving EDG No. 2 remaining operable and the station blackout diesel generator (SBODG) available.

As originally scheduled, major work was planned to be performed on DHR train No. 2 associated with EDG No. 2. DBNPS performs major maintenance on one DHR train each outage.

When fuel is being offloaded, one DHR train associated with the operable EDG No. 2 will be aligned to the reactor vessel in accordance with Technical Specifications (TS), and one DHR train will be aligned to the spent fuel pool

(SFP). After the core is entirely offloaded to the SFP, DHR train No. 2 associated with the operable EDG No. 2 will be taken out of service as planned. The DHR train No. 1 normally associated with EDG No. 1 will need to be supplied by a reliable source of standby emergency AC power, since the normal standby Class 1E AC power source (EDG No. 1) will be unavailable.

The detailed outage planning performed prior to identifying the need to repair EDG No. 1 assumed that this component would be available. Rescheduling the outage work would significantly impact the preplanning done to minimize shutdown risk. Work to be performed during the DHR train No. 2 outage includes work to address pressure locking thermal binding concerns and, therefore, needs to be performed during this outage.

Waiting until EDG No. 1 is repaired, reinstalled and tested will cause a delay in the schedule and, hence, a delay in the resumption of power operation by approximately six days, unless an alternate means of supplying a reliable source of AC power is provided.

The NRC has previously reviewed the use of the SBODG to provide a reliable supply of power during allowed outage times (AOT) of up to 7 days during power operation if an EDG is declared out of service. The increased AOT was incorporated into the TS by Amendment No. 206.

The normal electrical power sources at Davis-Besse Nuclear Power Station (DBNPS) consist of three offsite power sources (Startup Transformers 1 and 2, and the Unit Auxiliary Transformer) and two onsite power sources (Emergency Diesel Generators 1 and 2). Offsite power is supplied to the DBNPS switchyard by three 345 kV lines. Two electrically and physically separated circuits from the switchyard provide AC power through the startup transformers to the 4.16 kV Engineered Safety Features (ESF) busses. The ESF busses also can be powered from the switchyard through the Unit Auxiliary Transformer by removing the main generator disconnecting links. Onsite power is supplied by two redundant EDGs. One EDG is connected to ESF bus C1 and the other EDG is connected to ESF bus D1. In the event of a loss of offsite power, the EDGs are automatically connected to the ESF busses in sufficient time to safely shutdown the reactor or to mitigate the consequences of a design bases accident (DBA).

In addition to the two electrical circuits powered from the switchyard and the two onsite EDGs, DBNPS has installed a station blackout diesel generator (SBODG). This non-Class 1E 4.16 kV SBODG meets the definition of an alternate AC (AAC) power source under the requirements of 10 CFR 50.63. Preoperational testing of the SBODG was completed during DBNPS's eighth refueling outage in 1993. The staff evaluated the SBODG for compliance with the requirements of 10 CFR 50.63 and found it acceptable as documented in a Safety Evaluation dated March 7, 1991.

Additionally, EDG No. 2 is capable of providing electrical power to engineered safety features (ESF) bus C1 via bus D2, using currently approved plant procedures, if necessary. Nonessential bus D2 is seismic Class II. It has, however, been structurally upgraded such that it meets the criteria of the DBNPS site program to address Unresolved Safety Issue A-46 (the Seismic

Qualification Utility Group (SQUG) program). The SQUG program utilizes industrial experience from actual earthquakes to provide a more realistic assessment of the survivability of plant equipment. Therefore, a basis exists to conclude that bus D2 has sufficient margin for the DBNPS site.

During the time that the SBODG is relied upon to provide an emergency power source, the full core will be located in the spent fuel pool. The spent fuel pool contains approximately 300,000 gallons of borated water and is located in the Seismic Category I auxiliary building. The pool is seismically designed and lines penetrating the pool liner can be isolated, if required. As described in the USAR, the design heat load for the normal batch discharge case assumes 9 batches from prior refuelings, the most recent batch discharged 65 days prior, followed by a discharge of 177 assemblies after 150 hours of decay. This case represents a design basis heat load of 29.5 Million BTU. With one pump and two heat exchangers operable the SFP temperature can be maintained below 140°F based on a heat removal capacity of 30 MBTU/hr.

The heat load associated with the current core offload plus the stored fuel is approximately 23 million BTU per hour (MBTU/hr). The SFP can be maintained below 125°F provided component cooling water (CCW) temperature is  $\leq 65^\circ\text{F}$ . The current CCW temperature is being maintained below 65°F. Based on the approximately 23 MBTU/hr heat load in the SFP, if a complete loss of SFP cooling occurs, the temperature of the SFP will increase at a rate of approximately 9.5°F/hr. It would take approximately 8 hours before the SFP temperature reaches 200°F. Therefore, ample time is available to restore cooling to the SFP via the spent fuel pool cooling system or by train 1 of the DHR system, if necessary.

The licensees will institute the following compensatory actions, during the time DBNPS relies on either the SBODG or EDG-2 to supply decay heat removal loop No. 1, to improve the reliability of the AC power sources and prevent loss of SFP water inventory:

1. A minimum of two offsite power sources will be available.
2. No work will be performed in the switchyard.
3. No work will be performed on the SBODG or EDG No. 2.
4. Operators will be briefed on contingency plans for supplying fuel oil to the SBODG.
5. A shutdown risk contingency plan will be developed in accordance with plant procedures including developing a plan to add water to the SFP without relying on a DHR pump.
6. The SFP gate will be installed following the offload.
7. The fuel transfer tube isolation valves will be closed and the transfer canal and cask pit will be filled so that a loss of SFP water does not occur due to gate seal failure.

8. SBODG will be tested to verify it is operable before implementing this configuration (i.e. start and run the SBODG for 5 minutes). Also, once per shift, the licensees will verify that the breakers and required equipment to connect and supply the safety bus to the SBODG are in the appropriate configuration.

It is expected that the SBODG will not have to be relied upon for more than 7 days. During the first 7 days, NRC will inspect the procedures and operator training for supplying emergency power to decay heat removal train No. 1 from EDG-2. The licensee will notify the NRC in advance of exceeding the 7 day period to discuss future reliance on either the SBODG or EDG-2 to supply emergency power to decay heat removal train No. 1.

In summary, the SBODG will provide a reliable alternate emergency power source and EDG-2 will be operable to ensure that decay heat removal capability is available.

### 3.0 EMERGENCY CIRCUMSTANCES

In its April 18, 1996, application, the licensees requested that this amendment be treated as an emergency amendment. In accordance with 10 CFR 50.91(a)(5), the licensees provided the following information regarding why this emergency situation occurred and why it could not have been avoided. The extensive planning for the current refueling outage relied on assurance of the capability of removing core decay heat using decay heat removal loop No. 2. This decay heat removal loop includes the decay heat removal pump which is supplied emergency power by EDG No. 1. Prior to relying on EDG No. 1, previously identified EDG start time trends were investigated. As a result of this investigation, a load imbalance in the generator poles was discovered. Therefore, the generator was shipped offsite to be reworked. The licensees initially planned to supply power to decay heat removal loop No. 2 via the OPERABLE EDG (No. 2). In reviewing this configuration, the licensees determined that this could be accomplished in compliance with Technical Specifications but this configuration was not explicitly allowed by the USAR. Therefore, the licensees determined on April 17, 1996, that a potential unreviewed safety question existed and NRC approval should be sought.

The licensees submitted the amendment request in a timely manner, and requested emergency processing. Absent relief from the NRC, plant startup would be delayed for approximately 6 days because of the unavoidable problems with EDG No. 1, which the licensees conservatively identified and appropriately evaluated as requiring time consuming repairs that involved shipping the equipment offsite. To ensure that the risk assessment planning incorporated into the outage schedule was not compromised by shifting of activities resulting from the EDG being out of service, the option of using the SBODG as a reliable source of power was proposed. Throughout this process, the licensees acted promptly and kept the staff informed regarding the status of activities.

The staff has concluded that an emergency situation exists in that failure to act in a timely manner will result in an unnecessary delay in start up of the plant and that the licensees could not avoid the emergency situation once the

condition was identified. A discussion was held with NRC resident staff who believe the licensee's identification of the EDG-1 trending and subsequent testing were conducted in a timely and appropriate manner. Therefore, pursuant to 10 CFR 50.91(a)(5), this request is being handled on an emergency basis.

#### 4.0 BASIS FOR FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

As required by 10 CFR 50.91(a), the licensee has provided their analysis of the issue of no significant hazards consideration, which is presented below:

Toledo Edison has reviewed the proposed change and determined that a significant hazards consideration does not exist because operation of the Davis-Besse Nuclear Power Station, Unit No. 1, in accordance with these changes would:

- 1a. Not involve a significant increase in the probability of an accident previously evaluated because no accident initiators are affected.
- 1b. Not involve a significant increase in the consequences of an accident previously evaluated because a reliable source of backup power will be maintained which can readily be aligned to provide power to plant components required to mitigate any postulated accidents.
2. Not create the possibility of a new or different kind of accident from any previously evaluated because no new accident initiators or adverse operating conditions will be created by the proposed action.
3. Involve a significant reduction in a margin of safety because an adequate standby emergency AC power backup source is provided and sufficient time would be available to align and operate this source.

The staff has determined that the only accident initiators are loss of shutdown cooling which the licensee has evaluated and a seismic event which is independent of plant configuration. Based on the NRC staff review and the review of the licensee's analysis and, based on this review, it appears that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has determined that the amendment request involves no significant hazards consideration.

#### 5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant changes in the types, of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). The Commission has made a final no significant hazards finding with respect to this amendment. Pursuant to 10 CFR 51.22(b), no environmental

impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

#### 6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Ohio State official was notified of the proposed issuance of the amendment. The State official had no comments.

#### 7.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: S. Mitra  
J. Tatum  
W. Lyon  
L. Gundrum

Date: April 19, 1996