September 12, 2000

Mr. Guy G. Campbell, Vice President - Nuclear
FirstEnergy Nuclear Operating Company
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - ISSUANCE OF AMENDMENT (TAC NO. MA6092)

Dear Mr. Campbell:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 242 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit 1. The amendment revises the Technical Specifications in response to your application dated July 28, 1999, as supplemented on June 6, 2000.

This amendment revises the ultimate heat sink (UHS) average water temperature from 85 degrees Fahrenheit (°F) to 90 °F and permits plant operations in Operating Modes 1 through 4 with an average water temperature of 90 °F.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

/RA/

Stephen P. Sands, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosures: 1. Amendment No. 242 to License No. NPF-3
2. Safety Evaluation

Distribution w/encls:

GHill (2)	KDesai
PUBLIC	WBeckner
PD3-2 r/f	OGC
ACRS	GGrant, RIII
SSaba	

cc w/encls: See next page

DOCUMENT NAME: G:\PDIII-2\DAVISBES\db-amd-6092.wpd

OFFICE	PM/PD3-2	LA/PD3-2	NRR:EEIB	NRR:SRXB	OGC	SC/PD3-2
NAME	SSands SPS	THarris	JCalvo	JWermiel	AHH	AMendiola
DATE	08/17/00	08/17/00	08/18/00	08/21/00	08/22/00	~~08/ /00~~ 9/12/00

OFFICIAL RECORD COPY #39

DF01

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 12, 2000

Mr. Guy G. Campbell, Vice President - Nuclear
FirstEnergy Nuclear Operating Company
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1 - ISSUANCE OF AMENDMENT (TAC NO. MA6092)

Dear Mr. Campbell:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 242 to Facility Operating License No. NPF-3 for the Davis-Besse Nuclear Power Station, Unit 1. The amendment revises the Technical Specifications in response to your application dated July 28, 1999, as supplemented on June 6, 2000.

This amendment revises the ultimate heat sink (UHS) average water temperature from 85 degrees Fahrenheit (°F) to 90 °F and permits plant operations in Operating Modes 1 through 4 with an average water temperature of 90 °F.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Stephen P. Sands, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosures: 1. Amendment No. 242 to License No. NPF-3
2. Safety Evaluation

cc w/encls: See next page

cc:

Mary E. O'Reilly
FirstEnergy
76 South Main Street
Akron, OH 44308

James L. Freels
Manager - Regulatory Affairs
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
5501 North State - Route 2
Oak Harbor, OH 43449-9760

Jay E. Silberg, Esq.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street, NW.
Washington, DC 20037

Regional Administrator
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, IL 60523-4351

Michael A. Schoppman
Framatome Technologies Incorporated
1700 Rockville Pike, Suite 525
Rockville, MD 20852

Resident Inspector
U.S. Nuclear Regulatory Commission
5503 North State Route 2
Oak Harbor, OH 43449-9760

James H. Lash, Plant Manager
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, OH 43449-9760

Harvey B. Brugger, Supervisor
Radiological Assistance Section
Bureau of Radiation Protection
Ohio Department of Health
P.O. Box 118
Columbus, OH 43266-0118

James R. Williams, Executive Director
Ohio Emergency Management Agency
2855 West Dublin Granville Road
Columbus, OH 43235-2206

Director
Ohio Department of Commerce
Division of Industrial Compliance
Bureau of Operations & Maintenance
6606 Tussing Road
P.O. Box 4009
Reynoldsburg, OH 43068-9009

Ohio Environmental Protection Agency
DERR--Compliance Unit
ATTN: Zack A. Clayton
P.O. Box 1049
Columbus, OH 43266-0149

State of Ohio
Public Utilities Commission
180 East Broad Street
Columbus, OH 43266-0573

Attorney General
Department of Attorney
30 East Broad Street
Columbus, OH 43216

President, Board of County
Commissioners of Ottawa County
Port Clinton, OH 43252

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-346

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 242
License No. NPF-3

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the FirstEnergy Nuclear Operating Company (the licensee) dated July 28, 1999, as supplemented on June 6, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

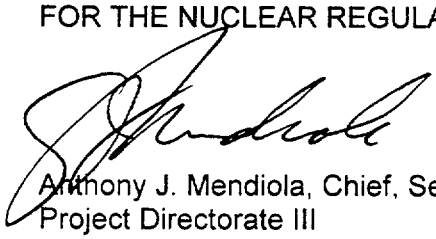
   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 242 , are hereby incorporated in the license. FirstEnergy Nuclear Operating Company shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented not later than 90 days after issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Anthony J. Mendiola, Chief, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: September 12, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 242

FACILITY OPERATING LICENSE NO. NPF-3

DOCKET NO. 50-346

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove	Insert
3/4 7-16	3/4 7-16

PLANT SYSTEMS

3/4.7.5 ULTIMATE HEAT SINK

LIMITING CONDITION FOR OPERATION

3.7.5.1 The ultimate heat sink shall be OPERABLE with:

a. A minimum water level at or above elevation 562.0 feet International Great Lakes Datum, and

b. An average water temperature of ≤ 90° F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the requirements of the above specification not satisfied, be in at least HOT STANDBY within 2.5 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.5.1 The ultimate heat sink shall be determined OPERABLE at least once per 24 hours by verifying the average water temperature and water level to be within their limits.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

September 12, 2000

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 242 TO FACILITY OPERATING LICENSE NO. NPF-3

FIRSTENERGY NUCLEAR OPERATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

DOCKET NO. 50-346

1.0 INTRODUCTION

In the letters of July 28, 1999, and June 6, 2000, FirstEnergy Nuclear Operating Company (the licensee) requested a technical specification (TS) change for Davis-Besse Nuclear Power Station. The proposed TS change will increase the ultimate heat sink (UHS) average water temperature from 85 degrees Fahrenheit (°F) to ≤90 °F. TS limiting condition for operation (LCO) 3/4.7.5.1 would allow plant operation in Operating Modes 1 through 4 with an average water temperature of ≤90 °F. This TS change will prevent a shutdown of the plant during adverse summer meteorological conditions when the UHS temperature could reach 85 °F. The June 6, 2000, submittal provided additional clarifying information within the scope of the original *Federal Register* Notice and did not change the Commission's initial no significant hazards consideration determination.

2.0 BACKGROUND

The source of cooling water for the service water of Davis-Besse is Lake Erie and the service water pumps are located in the intake structure building. The water from the lake flows through an intake water system to the UHS forebay.

On August 17, 1995, the licensee submitted a Request for Enforcement Discretion due to an extended period of unusually hot weather; the average UHS temperature approached the TS limit of 85 °F. On August 18, 1995, the licensee submitted an emergency license amendment request to change the UHS TS temperature limit to ≤90 °F, on a temporary basis, which was withdrawn due to a gradual temperature decline. The Nuclear Regulatory Commission (NRC) staff requested that the licensee provide information regarding the UHS maximum calculated water temperature and the service water system's maximum assumed constant inlet temperature used in the containment performance analysis and their licensing basis. The licensee responded that the containment performance analysis did not require consideration of the loss of either the UHS intake canal or connection to Lake Erie, concurrent with a loss-of-coolant accident. The licensee performed a seismic evaluation to demonstrate that the non-seismic Class I portions of the intake system were capable of resisting the effects of a safe shutdown earthquake with no loss of function. On November 13, 1997, the licensee met with the NRC staff and made a commitment to perform a containment performance analysis considering a loss of the connection to Lake Erie to support this licensing amendment.

Based on historical trends, the temperature of the UHS is unlikely to exceed the present TS limit of 85 °F; however, this cannot be assured with a high degree of certainty. The licensee is requesting the approval of this amendment to avoid an emergency or exigent license amendment in the future.

3.0 EVALUATION

Lake Erie is the UHS for the Davis-Besse plant. Lake water flows through an intake water system consisting of buried conduit to the intake canal. The intake canal flows to the UHS forebay, where the intake structure containing the service water pumps is located. The UHS is the source of cooling water for the service water (SW) system. During the normal operation, the SW supplies cooling water to the containment air coolers (CACs) and the component cooling water (CCW) heat exchangers. During a design basis accident (DBA), the SW supplies cooling water to the CACs, the CCW heat exchangers, the emergency core cooling system (ECCS) air coolers, and the control room emergency ventilation system (CREVS). The SW system also performs numerous other functions which support power operation, but those are not important to safety.

The licensee performed various evaluations to determine the effect of an increase of 5 °F in the UHS temperature and the SW supply temperature during both normal plant operating and emergency operating conditions. The emergency operating conditions evaluation includes consideration of a loss of the connection with Lake Erie and the effect of a safe shutdown earthquake (SSE) on the intake canal.

Normal Operation:

Under normal operating conditions, the CACs maintain the containment average air temperature below the TS 3.6.1.5 limit of 120 °F. Extrapolation of normal operating conditions to $\leq$90 °F UHS temperature indicates that the CACs would maintain the containment average air temperature below 120 °F. During normal plant operating conditions, there is sufficient cooling capacity available in the CCW system to accommodate an increase in the SW supply UHS temperature to $\leq$90 °F. The automatic controls on the CCW system are set to normally maintain the CCW heat exchanger outlet temperature between 80 °F and 120 °F. An evaluation of the CCW heat exchangers indicates that an outlet temperature of 97 °F would be maintained with a $\leq$90 °F SW inlet temperature. The ECCS room coolers and the other SW system plant functions during normal operation would not have any adverse effect due to an increase in the SW supply UHS temperature. The emergency diesel generator (EDG) jacket cooling heat exchangers maintain the required temperature of the lube oil and diesel engine to ensure that the EDGs will perform their safety functions during and after an accident.

Emergency Operation:

During a loss-of-coolant accident (LOCA) postulation, a loss of power is assumed concurrent with a failure of an EDG. Thus, only one train of SW and one train of ECCS pumps are available. The refilling and cooling of the reactor core occurs within the first few minutes of the accident. The reactor is refilled via the core flood tanks and the low pressure injection (LPI)

pump using the water from the borated storage water tank (BWST). The containment spray (CS) pump injects water directly into containment without any cooling supplied by the SW system. The reactor core would be adequately cooled during this period and the SW temperature does not directly impact core cooling. Following depletion of the BWST inventory, the suctions of both the LPI pump and the CS pump are transferred to the containment emergency sump. The long-term containment temperature is controlled by the heat removal through the decay heat removal (DHR) system and CACs. The increase in containment temperature and pressure are within the design limits.

The previous LOCA analysis considered a steady state method to determine the UHS temperature. This method calculated the surface temperature of the UHS and did not consider the time to reach the steady state temperature. Therefore, this method over-estimated the UHS temperature (Updated Safety Analysis Report (USAR) Figure 9.2-6) by not including any time dependencies. The new UHS temperature analysis used a one-dimensional multilayer analysis that simulated the transient response of the UHS. The UHS model was benchmarked using the onsite meteorological data as observed during the summers of 1988 and 1995, when the UHS temperature approached 85 °F. The results of the analysis showed a good correlation between predicted and observed UHS temperature.

The forebay UHS temperature increase peaks at about 108 °F in 200,000 seconds (approximately 55 hours) and then gradually levels off at about 101 °F for a long-term cooling (Figure 3 of License Amendment Request 96-0008). This service water temperature profile remains below the design operating condition of the required cooling systems and equipment.

These updated LOCA analyses credit only the forebay portion of the intake canal, which is seismic Category I, plus one-third of the water surface area and one-third of the water volume in the non-seismic portion of the intake canal. The staff has evaluated the licensee's approach for UHS analysis and has found it acceptable.

The post-LOCA containment response analysis is re-performed assuming that the CACs receive SW for cooling at a conservative flowrate and the connection to Lake Erie does not exist. The previous containment performance analysis assumed that the connection between the intake canal and Lake Erie remains intact following a DBA, such that a constant SW temperature of 85 °F is maintained. The updated containment performance analysis does not credit the connection between the intake canal and Lake Erie. In this case, the SW discharge would be recirculated back to the intake canal forebay or intake structure. This would result in a variable SW temperature, initially at the proposed TS upper limit of $\leq$90 °F. The peak containment pressure occurs at approximately 15 seconds after the CACs are started. During this short period, the difference in the effectiveness of the CACs with 85 °F or 18-month °F is very small and has an insignificant effect on the containment response. The maximum peak temperature and pressure remain well below the maximum design conditions for the containment vessel.

The containment response analysis was redone by the licensee. The peak containment pressure is essentially the same as the previous analysis. The peak containment temperature is slightly higher (i.e., approximately 1.5 °F) than the previous analysis. As with the current analysis, the peak temperature spike is of such short duration that the temperature increase

does not affect the qualification of the equipment located in the containment. Also, the licensee's evaluation concluded that the qualification tests demonstrated that the instrumentation needed to monitor the course of an accident are not affected by the increase of the UHS temperature. The licensee reconfirmed in a telephone conference on March 29, 2000, that the increase of water temperature limit of UHS does not impact the environmental qualifications of any equipment.

The main steamline break (MSLB) containment response analysis was also re-performed. The peak containment pressure is essentially the same as the previous analysis. The peak containment temperature is slightly higher, approximately 1.5 °F, than the previous analysis. This increase is still below the large-break loss-of-coolant accident (LBLOCA) temperature profile. Therefore, the new analysis does not impact the environmental qualifications of any equipment.

The entire intake system is not designed as a seismic Class I structure. The connection with Lake Erie could be lost if an earthquake is assumed to collapse the non-seismic Class I intake conduit. Due to the loss of a connection to Lake Erie, in order to conserve the water inventory contained in the intake canal and forebay, the SW discharge would be routed to the forebay or intake structure. There will be sufficient water available to supply the SW pumps for 30 days without impacting the performance of the safety-related components. In the case of a seismic event, there is a plant emergency procedure which provides direction to establish temporary pumping to the intake forebay. It is expected that the connection between Lake Erie and the intake canal could be reestablished well within a 30-day period. The procedure requires further actions, including tripping the reactor, should forebay water level decrease to 564 ft International Great Lakes Datum (IGLD). For a seismic event only, the heat load will be lower than the LOCA event, therefore, the UHS temperature will be lower.

Summary

Based on our review, the staff has concluded that the proposed TS change will not adversely affect plant operation, jeopardize the performance of safety-related equipment, or otherwise compromise public health and safety. Therefore, we consider the proposed TS change to be acceptable.

4.0 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.

5.0 ENVIRONMENTAL CONSIDERATION

This 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. The staff has determined that the amendment involves no significant increase in the amounts, and no significant change 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. The

Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (64 FR 46438). Accordingly, the amendment meets the eligibility criteria for categorical

exclusion set forth in 10 CFR 51.22(c)(9). 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 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: K.Desai, S.Saba

Date: September 12, 2000