



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

April 15, 1994

Docket No. 50-346

Mr. Donald C. Shelton
Senior Vice President - Nuclear
Centerior Service Company
c/o Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, Ohio 43449

Dear Mr. Shelton:

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION - NRC BULLETIN 88-11,
"PRESSURIZER SURGE LINE THERMAL STRATIFICATION" (TAC NO. M72128)

The NRC staff issued Bulletin 88-11 on December 20, 1988, which requested licensees of pressurized water reactors (PWRs) to take a series of actions to verify the integrity of pressurizer surge lines. The Bulletin was issued in response to unexpected surge line movement at the Trojan plant, which was determined to be caused by a previously unconsidered thermal stratification phenomenon. The actions required by the Bulletin included conducting a visual inspection for indications of damage or distress, performing a bounding analysis to justify continued operation, establishing monitoring programs to obtain plant-specific data and updating stress and fatigue analyses to ensure compliance with applicable Code requirements.

The Babcock and Wilcox (B&W) Owners Group (BWO) established a program to resolve these issues for B&W plants. The BWO submitted a report BAW-2127, "Pressurizer Surge Line Thermal Stratification," in December 1990. BAW-2127 addressed only B&W lowered loop plants. The staff reviewed BAW-2127 and issued a safety evaluation (SE) in July 1991. In that SE, the staff concluded that the methodology used to analyze and evaluate the stress and fatigue effects due to thermal stratification and thermal striping was generally acceptable. The staff found that all concerns on the report were resolved with the exception of the stress index used to calculate thermal expansion stress for pressurizer surge line (PSL) elbows. The staff suggested several options for resolving the stress index issue in the July 1991 SE. The staff's July 1991 SE is included as Enclosure 1.

The BWO conducted an additional analysis of the surge line elbows and submitted it to the staff as BAW-2127, Supplement 2 in May 1992. The staff and its consultant, Brookhaven National Laboratory (BNL), have reviewed BAW-2127, Supplement 2. The staff concurs with BNL that the methodology used to analyze the effects of thermal stratification and striping in the PSL is acceptable. The staff concludes that the B&W analyses adequately demonstrate the structural integrity of the B&W lowered loop plant surge lines for the 40-year design life of the plant, while considering the effects of thermal stratification. In addition, the staff concurs with BNL's recommendation that

200002

9404250113 940415
PDR ADOCK 05000346
P PDR

NRC FILE CENTER COPY

DF01
111

enhanced inservice inspections of the surge line be performed to provide additional confidence in structural integrity. The staff recommends that licensees perform volumetric examination of critical elbow components as part of future ASME Section XI inservice examinations. The staff's safety evaluation of BAW-2127 and BAW-2127, Supplement 2, is included as Enclosure 2.

Please note in the staff's SE, the staff concurs with BNL's recommendation for performing enhanced inservice inspection of the pressurizer surge line elbows. The staff believes the recommendation is prudent due to the fact that an elastic-plastic analysis was necessary to confirm the adequacy of surge lines at BWOOG facilities. The staff believes that inservice inspections on the surge line elbows may detect the presence of preexisting flaws that may have propagated under the influence of stratification induced fatigue. The additional examinations are staff recommendations only. As such, you may implement the recommendations on a voluntary basis.

By letter dated October 8, 1991, Centerior Energy submitted a plant-specific evaluation for Davis-Besse in B&W report BAW-2127, Supplement 1. The report concluded that the Davis-Besse surge line would meet its 40-year design life with respect to stress and fatigue requirements. However, the report's conclusions were based upon the methodology of BAW-2127 rather than BAW-2127, Supplement 2, which addresses the staff's concerns regarding how secondary and peak stresses in the surge line elbows were calculated. By letter dated March 30, 1994, Centerior Energy reconfirmed the adequacy of the Davis-Besse surge line in accordance with the accepted BAW-2127, Supplement 2 methodology and submitted B&W report BAW-2127, Supplement 3. Specifically, Centerior Energy indicated that structural analysis shows that the Davis-Besse surge line can meet its 40-year design life given the completion of procedural and design modifications. The staff does not intend to complete a detailed safety evaluation of your specific analysis (i.e., BAW-2127, Supplement 3) since the methodology used in your analysis is the same as that used in the BAW-2127, Supplement 2 analysis.

Centerior Energy's letter dated December 3, 1993, specified the remaining procedural and design modifications relative to Bulletin 88-11 that would be completed by the ninth refueling outage, starting on October 1, 1994. The staff requests that the NRC be informed by letter when all actions related to Bulletin 88-11 are completed. The staff also recommends that Davis-Besse perform enhanced inservice inspections of their surge line to provide additional confidence in structural integrity, consistent with the recommendations in our attached SE for the lowered loop plants.

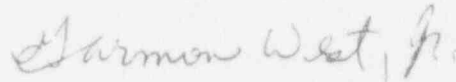
Mr. Donald C. Shelton

- 3 -

April 15, 1994

Based on the above discussion, references, and Centerior Enenergy's commitments and schedule by letter dated December 3, 1993, this completes the NRC staff's activities related to TAC M72128. However, the staff may audit or inspect the implementation at a later date. Please contact me at (301) 504-3063 if you have any questions regarding this information.

Sincerely,



Garmon West, Jr., Acting Project Manager
Project Directorate III-3
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Enclosures:

1. Safety Evaluation of BAW-2127,
transmitted to B&W Nuclear
Services from J. Shea, NRC,
dated July 24, 1991
2. Safety Evaluation of BAW-2127 and
BAW-2127, Supplement 2, dated
September 16, 1993

cc w/enclosures:
See next page

April 15, 1994

Based on the above discussion, references, and Centerior Engergy's commitments and schedule by letter dated December 3, 1993, this completes the NRC staff's activities related to TAC M72128. However, the staff may audit or inspect the implementation at a later date. Please contact me at (301) 504-3063 if you have any questions regarding this information.

Sincerely,

Original Signed By:

Garmon West, Jr., Acting Project Manager
Project Directorate III-3
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

Enclosures:

1. Safety Evaluation of BAW-2127, transmitted to B&W Nuclear Services from J. Shea, NRC, dated July 24, 1991
2. Safety Evaluation of BAW-2127 and BAW-2127, Supplement 2, dated September 16, 1993

cc w/enclosures:
See next page

DISTRIBUTION:

Docket File	OGC
PDIII-3 Reading	ACRS (10)
NRC & Local PDRs	EJordan
JRoe	Region III, DRP
JZwolinski	JHopkins
JHannon	JShea 14/E/21
GWest	JNorberg

OFFICE	LA:PDIII-3	PM:PDIII-3	PM:PDIII-3	EM&B	PD:PDIII-3
NAME	MRush <i>MR</i>	GWest:dy <i>dy</i>	JHopkins <i>SBH</i>	JNorberg <i>JN</i>	JHannon <i>JH</i>
DATE	4/12/94	4/12/94	4/12/94	4/13/94	4/13/94

OFFICIAL RECORD COPY

FILENAME: G:\DAVISBES\DRM72128.LTR

Mr. Donald C. Shelton
Toledo Edison Company

Davis-Besse Nuclear Power Station
Unit No. 1

cc:

Mary E. O'Reilly
Centerior Energy Corporation
300 Madison Avenue
Toledo, Ohio 43652

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

Mr. William T. O'Connor, Jr.
Manager - Regulatory Affairs
Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State - Route 2
Oak Harbor, Ohio 43449

Mr. James W. Harris, Director
Division of Power Generation
Ohio Department of Industrial
Regulations
P. O. Box 825
Columbus, Ohio 43216

Gerald Charnoff, Esq.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street, N. W.
Washington, D. C. 20037

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

Regional Administrator, Region III
U. S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

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

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. James R. Williams
State Liaison to the NRC
Adjutant General's Department
Office of Emergency Management
Agency
2825 West Granville Road
Columbus, Ohio 43235-2712

Resident Inspector
U. S. Nuclear Regulatory Commission
5503 N. State Route 2
Oak Harbor, Ohio 43449

Mr. John K. Wood, Plant Manager
Toledo Edison Company
Davis-Besse Nuclear Power Station
5501 North State Route 2
Oak Harbor, Ohio 43449

Robert E. Owen, Chief
Bureau of Radiological Health
Services
Ohio Department of Health
Post Office Box 118
Columbus, Ohio 43266-0118