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 50-439 Bellefonte Nuclear Plant, Unit 2, Tennessee Valley Au 05000439
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 GRIDLEY, R. Tennessee Valley Authority
 RECIP. NAME RECIPIENT AFFILIATION
 STOLZ, J. F. PWR Project Directorate 6

SUBJECT: Forwards response to Generic Ltr 83-25, Item 4.3. Util will modify reactor trip breakers to automatically actuate shunt attachments when design approved. Mods will be completed by 1 yr before fuel load. W/four oversize drawings.

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 TITLE: OR/Licensing Submittal: Salem ATWS Events 6L-83-28

NOTES: OIA 1cy. Application for permit renewal filed. 05000438
 OIA 1cy. Application for permit renewal filed. 05000439

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PWR-B PEICSB	2	2	PWR-B FOB	1	1
PWR-B PD6 LA	1	0	PWR-B PD6 PD 01	3	3
KALMAN, G	1	1	PWR-B PEICSB	1	1
PWR-B RSB	1	1			

INTERNAL: ACRS	16	16	ADM/LFMB	1	0
ELD/HDS2	1	0	IE/DI	1	1
IE/DGAVT	1	1	NRR LASHER, D	1	1
NRR PWR-A ADTS	1	1	NRR PWR-B ADTS	1	1
NRR/DSRO/RSIB	1	1	NRR/TAMB	1	1
<u>REG FILES</u> 04	1	1	RGN2	1	1
EXTERNAL: LPDR 03	1	1	NRC PDR 02	1	1
NSIC 05	1	1			

NOTES: 1 1

Drawings To: Reg Files

TENNESSEE VALLEY AUTHORITY

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DEC 29 1986

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz, Project Director
PWR Project Directorate No. 6
Division of Pressurized Water Reactors (PWR)
Licensing B
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Stolz:

In the Matter of Tennessee Valley Authority)
Docket Nos. 50-438 50-439

BELLEFONTE NUCLEAR PLANT - RESPONSE TO ITEM 4.3 OF GENERIC LETTER 83-28

Enclosed for your review is our Bellefonte-specific response to item 4.3 of Generic Letter 83-28. Enclosure 1 is our response to the eight questions resulting from your review of the B&W Owners's Group generic design concept and enclosure 2 is a listing of our commitments. Upon your approval of the Bellefonte design, TVA will modify the reactor trip breakers to automatically actuate the shunt trip attachments. The modifications will be completed one year before fuel load of the respective unit.

If you have any questions regarding this subject, please get in touch with Dennis L. Terrill at 205/574-8820.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. A. Danner
R. Gridley, Director
Nuclear Safety and Licensing

Enclosures
cc: See page 2

Drawings
TO: Reg Files
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PDR ADOCK 05000438
A PDR

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Director of Nuclear Reactor Regulation

DEC 29 1986

cc (Enclosures):

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ENCLOSURE 1

INFORMATION REQUIRED ON A PLANT SPECIFIC BASIS
FOR REVIEW AND STAFF APPROVAL OF MODIFICATIONS
TO PROVIDE AUTOMATIC ACTUATION OF REACTOR TRIP BREAKER
SHUNT TRIP ATTACHMENTS

1. A statement confirming that the UV sensor (high speed undervoltage relay) Model ITE-27H-211R, is environmentally and seismically qualified for its service conditions.

Response

The undervoltage sensor, ITE-27H-211R0175, has been environmentally and seismically qualified by Brown Boveri Electric Incorporated to IEEE 323-1974, IEEE 501-1978, and IEEE 344-1975. The sensor is qualified for -20°C to +55°C, 0 to 90% relative humidity (no condensation), and 6g ZPA. These qualifications envelope the service conditions at the sensor mounting location. The ITE-27H-211R0175 is therefore qualified for use in the control rod drive trip breaker shunt trip application at Bellefonte Nuclear Plant.

2. A statement confirming that all other additional components involved in the shunt trip circuits are environmentally and seismically qualified for their service conditions.

Response

The additional equipment used in the control rod drive trip breaker shunt trip application at Bellefonte is:

Potter Brumfield Rotary Relay	-	MDR 138-8
Electro Switch	-	Series 20 PGB-90453-5
Buchanan Terminal Blocks	-	NQB104 & NQB106

Potter Brumfield Rotary Relay MDR 138-8 has been qualified by Nu-Therm International Incorporated to IEEE 323-1974, IEEE 501-1978, and IEEE 344-1975. The MDR 138-8 relay is qualified for 0°C to 65°C, 40 to 60% relative humidity (no condensation), and 3.5g ZPA. These qualifications envelope the service conditions at the relay mounting location. The MDR 138-8 relay is therefore qualified for use in the control rod drive trip breaker shunt trip application at Bellefonte Nuclear Plant.

Electro Switch Series 20P has been qualified by Electro Switch Corporation to IEEE 323-1974 and IEEE 344-1975. The Electro Switch Series 20P is qualified for 80°C (120 hours), 95% relative humidity (96 hours), and 5g ZPA. These qualifications envelope the service conditions at the switch mounting location. The Electro Switch Series 20P is therefore qualified for use in the control rod drive trip breaker shunt trip application at Bellefonte Nuclear Plant.

Buchanan terminal blocks NQB104 and NQB106 have been qualified by Amerace Corporation to IEEE 323-1974 and IEEE 344-1975. The Buchanan terminal blocks NQB104 and NQB106 are qualified for temperatures up to 150°C and 5g ZPA. These qualifications envelope the service conditions at the mounting location. The Buchanan NQB104 and NQB106 terminal blocks are therefore qualified for use in the control rod drive trip breaker shunt trip application at Bellefonte Nuclear Plant.

- 3. A statement confirming that the shunt trip attachment is or will be environmentally and seismically qualified for its service conditions.

Response

The environmental and seismic testing performed by Wyle Laboratory (Report 42835-1 Rev. A dated January 13, 1975) for Arkansas Power and Light on the AC trip breaker utilizing the shunt trip device has been reviewed to determine whether or not the tests enveloped the TVA Required Response Spectra (RRS) provided in B&W document No. 58-0076-00, LRC Report LR:75:7017-01:1, "Seismic Suitability of Type III AC Breaker Cabinet," dated October 27, 1975. Section 4.6.2 of this report identifies Graph 2 of the Generic Response Spectra (GRS) as appropriate for TVA. This GRS also serves as the Required Response Spectra (RRS) for TVA. Comparison of the Tested Response Spectrum (TRS) for Arkansas with the RRS for TVA demonstrated that the Arkansas TRS did envelope the TVA RRS for both the horizontal and vertical spectra. Based on this comparison, the Arkansas TRS serves as a suitable technical justification for extension to qualify the shunt trip device to meet the TVA RRS. The Arkansas test report also envelopes the environmental qualifications required by TVA. The AC trip breaker utilizing the shunt trip device is therefore qualified for use at Bellefonte Nuclear Plant.

- 4. Identify the classification (safety related or not) and separation (train or channel identification) for the reactor trip shunt and UV trip circuits, power supplies, and any interface isolation devices.

Response

The control rod drive trip breaker undervoltage (UV) and shunt trip circuits are safety related. Safety related power sources are used to power the undervoltage and shunt trip circuits of the control rod drive trip breakers. Separation of power divisions has been maintained by use of conduit, barriers, and/or separation distances of six inches or more. Points where less than six inches separation distance occur are addressed in Item 5.

Power Division/Channel Assignments are as follows:

<u>Control Rod Drive Trip Breaker</u>	<u>Undervoltage Coil Channel</u>	<u>Shunt Trip Coil Channel</u>
Unit A	Vital 120VAC Bus CH D (RPS CH A)	Vital 125VDC Bus CH D
Unit B	Vital 120VAC Bus CH E (RPS CH B)	Vital 125VDC Bus CH E
Unit C	Vital 120VAC Bus CH F (RPS CH C)	Vital 125VDC Bus CH F
Unit D	Vital 120VAC Bus CH G (RPS CH D)	Vital 125VDC Bus CH G

The interface between the safety related DC power supply and the non-safety related plant annunciator, loss of DC shunt trip power alarm, is accomplished through the coil to contact isolation of the qualified Potter Brumfield MDR 138-8 relay.

The control rod drive trip breakers A & B are equipped with a source interrupt device. The source interrupt device actuates the A & B trip breaker shunt trip coil upon overvoltage or undervoltage of the supply bus. This function is to protect the holding coils for the control rod drives and is not considered safety-related.

The non-safety related source interrupt is isolated from the safety related shunt trip circuit through the coil to contact isolation of the qualified Potter Brumfield MDR 138-8 relay.

5. If the wiring to the UV sensor involves different separation groups (train or channel) identify the minimum separation (distance) between wiring of the different groups. Provide an analysis of the consequences of short circuits between wiring in different separation groups to confirm that the consequences do not adversely impact redundant safety related systems.

Response

Wiring to the UV sensor for the control rod drive (CRD) AC trip breakers does not involve different power divisions and therefore does not pose a concern where separation is less than six inches.

6. Provide an outline of the test procedures to independently verify the operability of the shunt and UV trip circuits and components. Identify the sequence of actions to be performed. Address your intent regarding periodic surveillance to confirm the operability of the power failure alarms.

Response

The following tests will be performed to verify operability of the shunt and undervoltage trip circuits.

- DC Shunt Trip Power Alarm Testing
- Undervoltage Trip Circuit Testing
- Source Interrupt Test (A and B trip breakers only)
- Shunt Trip Circuit Testing
- CRD Breaker Performance on Loss of 125 VDC Shunt Trip Power

The test frequency will be performed in accordance with the Standard Technical Specifications for Babcock and Wilcox pressurized water reactors and to ensure the system is maintained operable. Detailed procedures will be developed six months before fuel load.

7. Provide a draft of any proposed technical specification changes as a result of this modification.

Response

As covered in Item 6 response above and our response to Generic Letter 85-10, TVA will provide proposed Technical Specifications one year before fuel load.

8. Provide the electrical schematics for the shunt and UV trip circuits.

Response

The electrical schematics for the control rod drive trip breaker shunt and UV trip circuits are attached.

<u>Breaker Unit</u>	<u>Drawing Number</u>
A	1156039C
B	1156040C
C	1156041C
D	1156042C

ENCLOSURE 2

LIST OF COMMITMENTS

1. The following tests will be performed to verify operability of the shunt and undervoltage trip circuits.
 - DC Shunt Trip Power Alarm Testing
 - Undervoltage Trip Circuit Testing
 - Source Interrupt Test (A and B trip breakers only)
 - Shunt Trip Circuit Testing
 - CRD Breaker Performance On Loss of 125VDC Shunt Trip Power

Detailed procedures will be developed six months before fuel load.

2. The test frequency will be performed in accordance with the B&W Standard Technical Specifications and to ensure the system is maintained operable. Our response to Generic Letter 85-10, dated August 28, 1985, stated TVA will provide proposed technical specifications by one year before fuel load.
3. Upon NRC approval of the Bellefonte design, TVA will modify the reactor trip breakers to automatically actuate the shunt trip attachments. The modifications will be completed one year before fuel load of the respective unit.