Docket No. 50-346

License No. NPF-3

Serial No. 1054

June 22, 1984

TOLEDO EDISON

RICHARD P. CROUSE
Vice President
Nuclear
(419) 259-5221

Director of Nuclear Reactor Regulation
Attention: Mr. John F. Stolz
Operating Reactor Branch No. 4
Division of Operating Reactors
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Stolz:

This is in response to the Safety Evaluation Report (SER) dated April 30, 1984 (Log No. 1503) which addressed the proposed modifications to the Toledo Edison's Davis-Besse Nuclear Power Station, Unit 1, Reactor Trip System. These modifications were developed in response to the Required Actions Based on Generic Implications of Salem ATWS Event (Generic Letter 83-28, Log No. 1322 dated July 8, 1983).

In the SER, the staff concluded that certain aspects of the originally proposed design were inadequate. Toledo Edison has modified its Reactor Trip System design and has included the details of this design in the attachments. Within this submittal, responses to each specific concern identified within the referenced SER are included.

TED concludes that the modified TED design is consistent with the B&W Owners position, and is similar to the AP&L design for ANO-1 nuclear unit which is now approved by the NRC. Additionally, the modified TED design satisfies the conditions for approval set forth in the conclusion of the SER (Log No. 1503).

Very truly yours,

R P Crouse /
RPC:JSH:nlf
enclosures
cc: DB-1 NRC Resident Inspector

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REACTOR TRIP BREAKER SHUNT TRIP CIRCUIT MODIFICATION DAVIS-BESSE UNIT NO. 1

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REACTOR TRIP BREAKER SHUNT TRIP CIRCUIT MODIFICATION DAVIS-BESSE UNIT NO. 1

BACKGROUND

By letter dated December 9, 1983 (No. 1012)) Toledo Edison Company (TED) submitted a response to Item 4.3 of Generic Letter 83-28. The submittal included a description of the TED's design of shunt trip modification (TED's design) for the reactor trip breakers (RTBs) at Davis-Besse Nuclear Power Station (DBNPS) Unit No. 1. Also, described were the differences of Arkansas Light and Power Company's (AP&L) design for Arkansas Nuclear One Unit No. 1 (ANO-1) and TED's design for DBNPS Unit No. 1. In addition, TED's submittal included responses to specific questions identified in the NRC evaluation of the ANO-1 design which was provided to Toledo Edison Company by the NRC letter of September 22, 1983.

Subsequent to the review of TED's submittal, staff issued, by letter dated April 30, 1984 (503), a Safety Evaluation Report (SER), indicating the acceptable and unacceptable aspects of the TED's design. The staff requested that TED submit the modified design along with the proposed technical specification for the shunt trip by June 22, 1984.

As indicated in the SER, approval of the modified design would be conditioned on TED's response to Items (a) thru (f) described in the Conclusion (Pages 8 thru 9) of the SER.

Toledo Edison has modified the design for the addition of shunt trip devices, on the reactor trip breakers, to be consistent with the B&W Owners Group's position and to answer the concerns indicated in the SER.

PURPOSE

This letter describes the TED's modified design and addresses Items (a) thru (f) of the SER conclusions. TED intends to implement this modification during the 1984 refueling outage.

MODIFIED DESIGN

The TED's modified design of the shunt trip modification is same as the AP&L design for AC breakers. The specifics of the TED's design are as follows:

UV Sensor
(Sketches Nos. 26370-2, 26371-2)

In the modified design the Model ITE-27H-211R relay, operable from a Class IE 125 VDC power source, is used to actuate the shunt trip attachment.

TED will assure that the seismic qualification of this relay envelops the design basis seismic conditions of the location of RTBs at DBNPS Unit No. 1.

Power Supply
(Sketch No. 26372-1)

Power to shunt trip attachment of each reactor trip breaker (RTB) will be provided from a separate Class 1E power source. The cable carrying the control power will be Class 1E qualified and the associated conduit run will be installed to Seismic I category.

Control power to the non-safety related source interruption device (SID) will remain from the existing non-safety related 125 VDC source. Isolation between the non-safety related and the safety related wiring has been provided within the breakers and the cable routing outside the breakers.

Shunt Trip Attachments
(Sketch Nos. 26370-2, 26371-2)

In the modified design, the shunt trip attachments will be designated as safety related. The shunt trip attachments in all four breakers will be seismically qualified, based on the qualification testing of similar attachments in AK-2 breakers of Unit Electric Control, Inc. We will assure that the test results in this report are acceptable according to the industry standards and applicable to the RTBs at DBNPS Unit No. 1.

Indicating Lights
(Sketch Nos. 26370-2, 26371-2)

Two indicating lights are provided in the modified design. One will be lit when power is available for the shunt trip attachment, and the second will be lit when power is available for the under voltage sensor.

RESPONSE TO ITEMS (a) THRU (f) IN THE CONCLUSION OF SER ON PREVIOUSLY SUBMITTED TED DESIGN

Item (a) Confirmation of the seismic qualification of the UV sensor (ITE-27H-211B).

Response

The modified TED design no longer contains this relay. The new relay is Model ITE-27H-211R, which is same model as in the AP&L design. We will assure, prior to use, that the seismic qualification of this relay envelops the RTB's seismic requirements at the DBNPS Unit No. 1.

Item (b) Confirmation that the breakers with AC shunt trip coils are seismically qualified.

Response

TED's modified design no longer uses AC shunt trip coils, therefore this question is not applicable. The DC coils used will be verified to be seismically qualified, prior to use, for Davis-Besse Station.

Item (c) Designation of the automatic shunt trip circuits as safety-related and incorporation of design features as defined in Items 4 and 5 above.

Response

The shunt trip attachments are now designated as safety related. Both undervoltage and shunt trip circuits of each RTB are powered from the separate Class 1E sources (120 VAC and 125 VDC respectively), thus maintaining the channel separation among the RTBs.

There is channel separation in the cable routing of the UVD trip circuits, and the same be provided in the routing of cables for shunt trip circuits.

Isolation of non-safety related SID from the 1E shunt trip will be provided through the coil to contact isolation of a Class 1E relay (94). (see drawing 26370-2)

A result of the modified design is that the statements made in Section 4b of the SER are not applicable.

Item (d) Incorporation of status indicating lights in the design and submission of revised test procedures as defined in Item 6 above.

Response

The additional status indicating lights are included in the modified design. The test outline is included as Attachment II to this letter.

Item (e) Submission of revised technical specification as defined in Item 7 above.

Response

Davis-Besse Unit 1 is covered by standardized technical specifications. Attachment III contains copies of the applicable portions relating to Reactor Trip Breakers. Section 4.3.1.1.1 requires that surveillance testing be accomplished by performing a CHANNEL FUNCTIONAL TEST of the Control Rod Drive Trip Breaker on a monthly basis. The definition of CHANNEL FUNCTIONAL TEST (Attachment III, Page 1-3) includes verification of alarm and/or trip functions.

TED interprets trip functions to include all trip functions which encompasses the shunt trip attachment to reactor trip breakers. The test of the shunt trip attachment can only be done independent of the test of the UVD to assure its function. TED's surveillance test procedures will be modified to include testing of the shunt trip attachments when they are installed.

We therefore conclude that the existing technical specifications explicitly state that testing independently confirms the operability of both the shunt and undervoltage trip attachments.

Item (f) Submission of revised electrical schematics to reflect the changes defined in Items 4, 5 and 6 above.

Response

Revised electrical schematics Nos. 26370-2, 26371-2 and 26372-1 are attached to this letter.

TEST OUTLINE

1.0 OBJECTIVE:

The purpose of this outline is to list the sequence of operations required to independently verify the operability of the UVD and shunt trip attachment of the four reactor trip breakers A, B, C & D. It is being assumed that Anticipatory Reactor Trip System (ARTS) will be in normal functional state at the time of this testing.

2.0 PROCEDURE: (Refer to Sketches Nos. 26370-2 and 26371-2)

2.1 Testing of UV trip circuit and the alarm relay (typical for all four breakers).

2.1.1 Verify that the breaker under test is in closed position and the control power to the shunt trip circuit of the breaker is ON (DC indicating light on the breaker is lit). Also verify that Reactor Protection System (RPS) is energized and the AC indicating light on the breaker is lit.

2.1.2 Turn the key operated hand switch to "UV Test" position and hold.

2.1.3 Observe that the DC indicating light goes out and confirm that an alarm is received in the Control Room indicating a loss of shunt trip circuit control power. Also observe that the AC indicating light remains lit.

2.1.4 At the Reactor Trip Module of the RPS, place the Reactor Trip Module Reactor Protection channel switches "A" and "B" in the "Sim Trip" position. This will actuate the relay Contacts A and B in the undervoltage trip circuit of the breaker associated with the RPS channel actuated.

2.1.5 Verify breaker tripping by observing the breaker local indication and the AC indicating light going out, instanteously.

2.1.6 Observe that upon releasing the test switch knob, the DC indicating light is lit again indicating resumption of control power to the shunt trip and the AC indicating light remains out.

2.2 Testing of the shunt trip circuit (typical for all four breakers).

2.2.1 Verify that the breaker under test is in closed position and the control power to the shunt trip circuit is available (DC indicating light is lit). Observe that the AC indicating light is also lit indicating the RPS energized.

2.2.2 Turn the key operated hand switch to "shunt trip" position, the breaker will trip and the two indicating lights go out.

3.0 ACCEPTANCE CRITERIA:

Each Reactor Trip Breaker trips normally, both on UV and shunt trip tests.

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3/4.3 INSTRUMENTATION

3/4.3.1 REACTOR PROTECTION SYSTEM INSTRUMENTATION

LIMITING CONDITION FOR OPERATION

3.3.1.1 As a minimum, the Reactor Protection System instrumentation channels and bypasses of Table 3.3-1 shall be OPERABLE with RESPONSE TIMES as shown in Table 3.3-2.

APPLICABILITY: As shown in Table 3.3-1.

ACTION:

As shown in Table 3.3-1.

SURVEILLANCE REQUIREMENTS

4.3.1.1.1 Each Reactor Protection System instrumentation channel shall be demonstrated OPERABLE by the performance of the CHANNEL CHECK, CHANNEL CALIBRATION and CHANNEL FUNCTIONAL TEST operations during the MODES and at the frequencies shown in Table 4.3-1.

4.3.1.1.2 The total bypass function shall be demonstrated OPERABLE at least once per 18 months during CHANNEL CALIBRATION testing of each channel affected by bypass operation.

4.3.1.1.3 The REACTOR PROTECTION SYSTEM RESPONSE TIME of each reactor trip function shall be demonstrated to be within its limit at least once per 18 months. Each test shall include at least one channel per function such that all channels are tested at least once every N times 18 months where N is the total number of redundant channels in a specific reactor trip function as shown in the "Total No. of Channels" column of Table 3.3-1.

TABLE 3.3-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION

FUNCTIONAL UNIT	TOTAL NO. OF CHANNELS	CHANNELS TO TRIP	MINIMUM CHANNELS OPERABLE	APPLICABLE MODES	ACTION
1. Manual Reactor Trip	2	1	2	1, 2 and *	1
2. High Flux	4	2	3	1, 2	2#
3. RC High Temperature	4	2	3	1, 2	3#
4. Flux - Δ Flux - Flow	4	2(a)(b)	3	1, 2	2#
5. RC Low Pressure	4	2(a)	3	1, 2	3#
6. RC High Pressure	4	2	3	1, 2	3#
7. RC Pressure-Temperature	4	2(a)	3	1, 2	3#
8. High Flux/Number of Reactor Coolant Pumps On	4	2(a)(b)	3	1, 2	3#
9. Containment High Pressure	4	2	3	1, 2	3#
10. Intermediate Range, Neutron Flux and Rate	2	0	2(c)	1, 2 and *	4
11. Source Range, Neutron Flux and Rate					
A. Startup	2	0	2	2## and *	5
B. Shutdown	2	0	1	3, 4 and 5	6
12. Control Rod Drive Trip Breakers	2 per trip system	1 per trip system	2 per trip system	1, 2 and *	7#
13. Reactor Trip Module	2 per trip system	1 per trip system	2 per trip system	1, ? and *	7#
14. Shutdown Bypass High Pressure	4	2	3	2**, 3** 4**, 5**	6#

TABLE 3.3-1 (Continued)

TABLE NOTATION

*With the control rod drive trip breakers in the closed position and the control rod drive system capable of rod withdrawal.

**When Shutdown Bypass is actuated.

#The provisions of Specification 3.0.4 are not applicable.

##High voltage to detector may be de-energized above 10^{-10} amps on both Intermediate Range channels.

(a) Trip may be manually bypassed when RCS pressure ≤ 1820 psig by actuating Shutdown Bypass provided that:

(1) The High Flux Trip Setpoint is ≤ 5% of RATED THERMAL POWER,

(2) The Shutdown Bypass High Pressure Trip Setpoint of ≤ 1820 psig is imposed, and

(3) The Shutdown Bypass is removed when RCS pressure > 1820 psig.

(b) Trip may be manually bypassed when Specification 3.10.3 is in effect.

(c) The minimum channels OPERABLE requirement may be reduced to one when Specification 3.10.1 or 3.10.2 is in effect.

ACTION STATEMENTS

ACTION 1 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and/or open the control rod drive trip breakers.

ACTION 2 - With the number of OPERABLE channels one less than the Total Number of Channels STARTUP and/or POWER OPERATION may proceed provided all of the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within one hour.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1,

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

and the inoperable channel above may be bypassed for up to 30 minutes in any 24 hour period when necessary to test the trip breaker associated with the logic of the channel being tested per Specification 4.3.1.1.1, and

c. Either, THERMAL POWER is restricted to ≤ 75% of RATED RATED THERMAL and the High Flux Trip Setpoint is reduced to ≤ 85% of RATED THERMAL POWER within 4 hours or the QUADRANT POWER TILT is monitored at least once per 12 hours.

ACTION 3 - With the number of OPERABLE channels one less than the Total Number of Channels STARTUP and POWER OPERATION may proceed provided both of the following conditions are satisfied:

a. The inoperable channel is placed in the tripped condition within one hour.

b. The Minimum Channels OPERABLE requirement is met; however, one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1, and the inoperable channel above may be bypassed for up to 30 minutes in any 24 hour period when necessary to test the trip breaker associated with the logic of the channel being tested per Specification 4.3.1.1.1.

ACTION 4 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL Power level:

a. ≤ 5% of RATED THERMAL POWER restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 5% of RATED THERMAL POWER.

b. > 5% of RATED THERMAL POWER, POWER OPERATION may continue.

TABLE 3.3-1 (Continued)

ACTION STATEMENTS (Continued)

ACTION 5 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement and with the THERMAL POWER level:

a. $\leq 10^{-10}$ amps on the Intermediate Range (IR) instrumentation, restore the inoperable channel to OPERABLE status prior to increasing THERMAL POWER above 10^{-10} amps on the IR instrumentation.

b. $> 10^{-10}$ amps on the IR instrumentation, operation may continue.

ACTION 6 - With the number of channels OPERABLE one less than required by the Minimum Channels OPERABLE requirement, verify compliance with the SHUTDOWN MARGIN requirements of Specification 3.1.1.1 within one hour and at least once per 12 hours thereafter.

ACTION 7 - With the number of OPERABLE channels one less than the Total Number of Channels STARTUP and/or POWER OPERATION may proceed provided all of the following conditions are satisfied:

a. Within 1 hour:

1. Place the inoperable channel in the tripped condition, or

2. Remove power supplied to the control rod trip device associated with the inoperative channel.

b. One additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.1.1.1, and the inoperable channel above may be bypassed for to 30 minutes in any 24 hour period when necessary to test the trip breaker associated with the logic of the channel being tested per Specification 4.3.1.1.1. The inoperable channel above may not be bypassed to test the logic of a channel of the trip system associated with the inoperable channel.

ACTION 8 - With the number of channels OPERABLE, less than required by the Minimum Channels OPERABLE requirement, be in at least HOT STANDBY within 6 hours.

TABLE 3.3-2

REACTOR PROTECTION SYSTEM INSTRUMENTATION RESPONSE TIMES

FUNCTIONAL UNIT	RESPONSE TIMES** (seconds)
1. Manual Reactor Trip	Not Applicable
2. High Flux*	$\leq$ 0.266
3. RC High Temperature	Not Applicable
4. Flux - Δ Flux - Flow* - Variable Flow	$\leq$ 1.77
- Constant Flow	$\leq$ 0.266
5. RC Low Pressure	$\leq$ 0.341
6. RC High Pressure	$\leq$ 0.341
7. RC Pressure - Temperature - Constant Temperature	Not Applicable
8. High Flux/Number of Reactor Coolant Pumps On*	$\leq$ 0.451***
9. Containment High Pressure	Not Applicable

* Neutron detectors are exempt from response time testing. Response time of the neutron flux signal portion of the channel shall be measured from detector output or input of first electronic component in channel.

** Including sensor (except as noted), RPS instrument delay and the breaker delay.

*** A 0.24 sec delay time has been assumed for pump contact monitor.

TABLE 4.3-1 (Continued)

NOTATION

(1) - If not performed in previous 7 days.

(2) - Heat balance only, above 15% of RATED THERMAL POWER.

(3) - When THERMAL POWER [TP] is above 30% of RATED THERMAL POWER [RTP], compare out-of-core measured AXIAL POWER IMBALANCE [API_o] to incore measured AXIAL POWER IMBALANCE [API_i]. Recalibrate if:

$$\frac{RTP}{TP}\ [API_o - API_i] \geq 3.5\%$$

(4) - AXIAL POWER IMBALANCE and loop flow indications only.

(5) - Verify at least one decade overlap if not verified in previous 7 days.

(6) - Each train tested every other month.

(7) - Neutron detectors may be excluded from CHANNEL CALIBRATION.

(8) - Flow rate measurement sensors may be excluded from CHANNEL CALIBRATION. However, each flow measurement sensor shall be calibrated at least once per 18 months.***

* - With any control rod drive trip breaker closed.

** - When Shutdown Bypass is actuated.

*** - Eighteen-month surveillance test due in March 1982 delayed until March 31, 1982.

TABLE 4.3-1

REACTOR PROTECTION SYSTEM INSTRUMENTATION SURVEILLANCE REQUIREMENTS

FUNCTIONAL UNIT	CHANNEL CHECK	CHANNEL CALIBRATION	CHANNEL FUNCTIONAL TEST	MODES IN WHICH SURVEILLANCE REQUIRED
1. Manual Reactor Trip	N.A.	N.A.	S/U(1)	N.A.
2. High Flux	S	D(2), and Q(7)	M	1, 2
3. RC High Temperature	S	R	M	1, 2
4. Flux - ΔFlux - Flow	S(4)	M(3) and Q(7,8)	M	1, 2
5. RC Low Pressure	S	R***	M	1, 2
6. RC High Pressure	S	R***	M	1, 2
7. RC Pressure-Temperature	S	R	M	1, 2
8. High Flux/Number of Reactor Coolant Pumps On	S	R	M	1, 2
9. Containment High Pressure	S	R	M	1, 2
10. Intermediate Range, Neutron Flux and Rate	S	R(7)	S/U(5)(1)	1, 2 and*
11. Source Range, Neutron Flux and Rate	S	R(7)	M and S/U(1)(5)	2, 3, 4 and 5
12. Control Rod Drive Trip Breakers	N.A.	N.A.	M and S/U(1)	1, 2 and*
13. Reactor Trip Module Logic	N.A.	N.A.	M	1, 2 and*
14. Shutdown Bypass High Pressure	S	R	M	2**, 3**, 4**, 5

CHANNEL FUNCTIONAL TEST

1.11 A CHANNEL FUNCTIONAL TEST shall be:

a. Analog channels - the injection of a simulated signal into the channel as close to the primary sensor as practicable to verify OPERABILITY including alarm and/or trip functions.

b. Bistable channels - the injection of a simulated signal into the channel sensor to verify OPERABILITY including alarm and/or trip functions.

CORE ALTERATION

1.12 CORE ALTERATION shall be the movement or manipulation of any component within the reactor pressure vessel with the vessel head removed and fuel in the vessel. Suspension of CORE ALTERATIONS shall not preclude completion of movement of a component to a safe conservative position.

SHUTDOWN MARGIN

1.13 SHUTDOWN MARGIN shall be the instantaneous amount of reactivity by which the reactor is subcritical or would be subcritical from its present condition assuming:

a. No change in axial power shaping rod position, and

b. All control rod assemblies (safety and regulating) are fully inserted except for the single rod assembly of highest reactivity worth which is assumed to be fully withdrawn.

IDENTIFIED LEAKAGE

1.14 IDENTIFIED LEAKAGE shall be:

a. Leakage (except CONTROLLED LEAKAGE) into closed systems, such as pump seal or valve packing leaks that are captured and conducted to a sump or collecting tank, or

b. Leakage into the containment atmosphere from sources that are both specifically located and known either not to interfere with the operation of leakage detection systems or not to be PRESSURE BOUNDARY LEAKAGE, or

DEFINED TERMS

1.1 The DEFINED TERMS of this section appear in capitalized type and are applicable throughout these Technical Specifications.

THERMAL POWER

1.2 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

RATED THERMAL POWER

1.3 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 2772 MWt.

OPERATIONAL MODE

1.4 An OPERATIONAL MODE shall correspond to any one inclusive combination of core reactivity condition, power level and average reactor coolant temperature specified in Table 1.1.

ACTION

1.5 ACTION shall be those additional requirements specified as corollary statements to each principle specification and shall be part of the specifications.

OPERABLE - OPERABILITY

1.6 A system, subsystem, train, component or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s). Implicit in this definition shall be the assumption that all necessary attendant instrumentation, controls, normal and emergency electrical power sources, cooling or seal water, lubrication or other auxiliary equipment, that are required for the system, subsystem, train, component or device to perform its function(s), are also capable of performing their related support function(s).

c. Reactor coolant system leakage through a steam generator to the secondary system.

UNIDENTIFIED LEAKAGE

1.15 UNIDENTIFIED LEAKAGE shall be all leakage which is not IDENTIFIED LEAKAGE or CONTROLLED LEAKAGE.

PRESSURE BOUNDARY LEAKAGE

1.16 PRESSURE BOUNDARY LEAKAGE shall be leakage (except steam generator tube leakage) through a non-isolable fault in a Reactor Coolant System component body, pipe wall or vessel wall.

CONTROLLED LEAKAGE

1.17 CONTROLLED LEAKAGE shall be that seal water flow from the reactor coolant pump seals.

QUADRANT POWER TILT

1.18 QUADRANT POWER TILT is defined by the following equation and is expressed in percent.

$$\text{QUADRANT POWER TILT} = 100\left(\frac{\text{Power in any core quadrant}}{\text{Average power of all quadrants}} - 1\right)$$

DOSE EQUIVALENT I-131

1.19 DOSE EQUIVALENT I-131 shall be that concentration of I-131 (μCi/gram) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134 and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table III of TID-14844, "Calculation of Distance Factors for Power and Test Reactor Sites."

$\bar{E}$ - AVERAGE DISINTEGRATION ENERGY

1.20 $\bar{E}$-AVERAGE DISINTEGRATION ENERGY shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies

REPORTABLE OCCURRENCE

1.7 A REPORTABLE OCCURRENCE shall be any of those conditions specified in Specifications 6.9.1.8 and 6.9.1.9.

CONTAINMENT INTEGRITY

1.8 CONTAINMENT INTEGRITY shall exist when:

a. All penetrations required to be closed during accident conditions are either:

   1. Capable of being closed by the Safety Features Actuation System, or

   2. Closed by manual valves, blind flanges, or deactivated automatic valves secured in their closed positions, except as provided in Table 3.6-2 of Specification 3.6.3.1.

b. All equipment hatches are closed and sealed,

c. Each airlock is OPERABLE pursuant to Specification 3.6.1.3,

d. The containment leakage rates are within the limits of Specification 3.6.1.2, and

e. The sealing mechanism associated with each penetration (e.g., welds, bellows or O-rings) is OPERABLE.

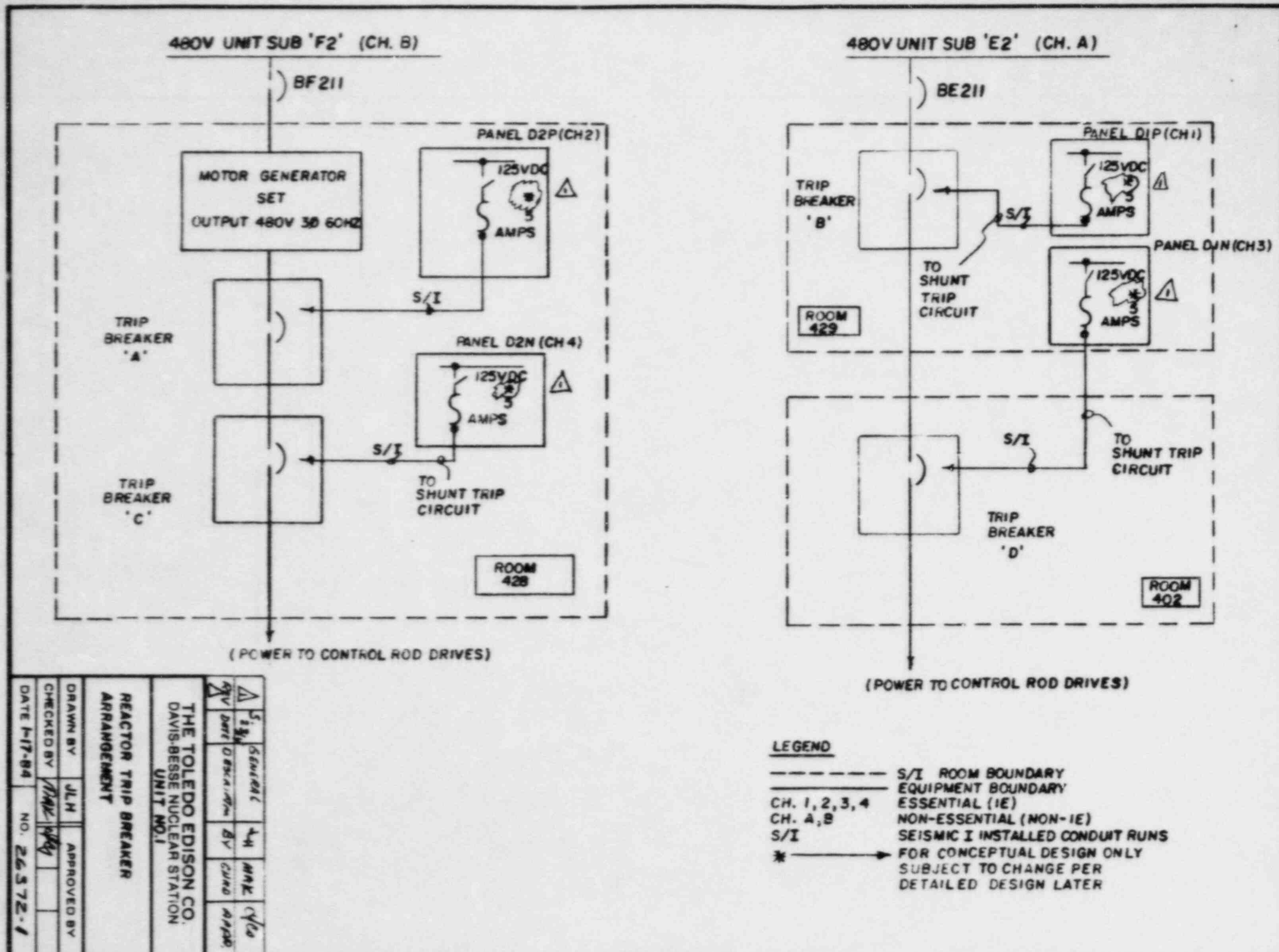
CHANNEL CALIBRATION

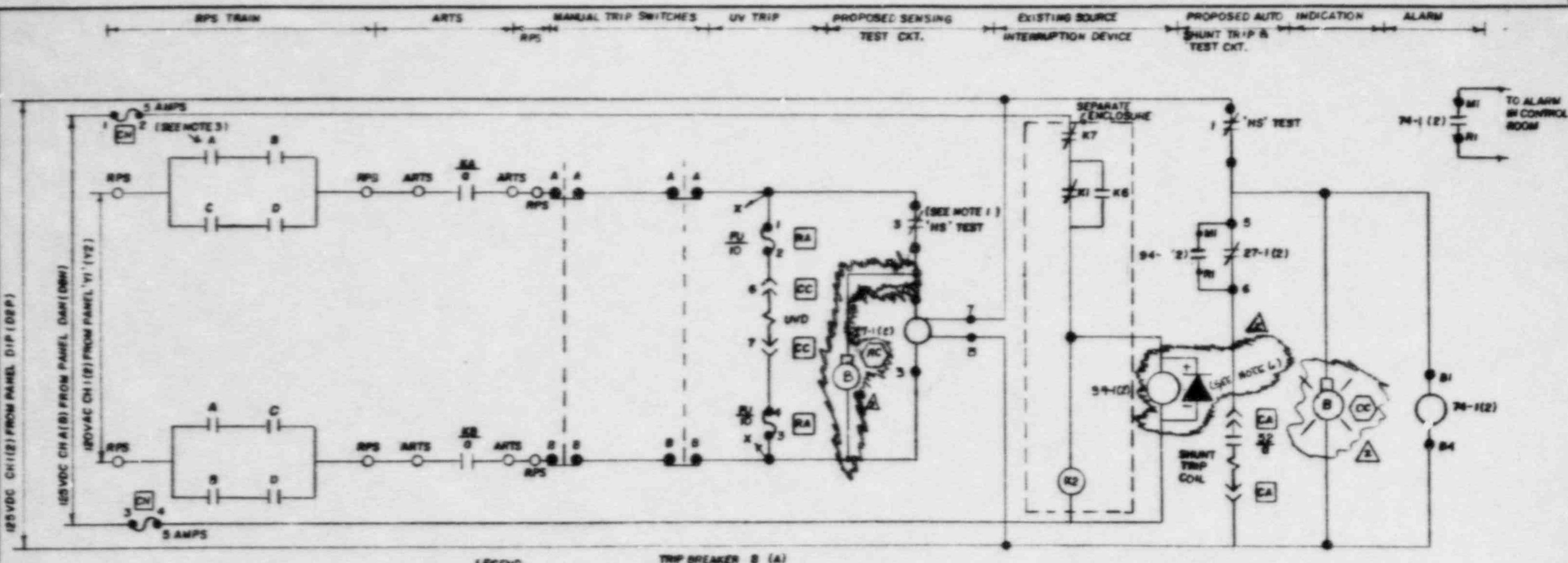
1.9 A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel output such that it responds with necessary range and accuracy to known values of the parameter which the channel monitors. The CHANNEL CALIBRATION shall encompass the entire channel including the sensor and alarm and/or trip functions, and shall include the CHANNEL FUNCTIONAL TEST. CHANNEL CALIBRATION may be performed by any series of sequential, overlapping or total channel steps such that the entire channel is calibrated.

CHANNEL CHECK

1.10 A CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

NEWFAX 12/83 N38506





LEGEND

27 — UNDER VOLTAGE SENSOR ITE-27H-B1R
74 — ALARM RELAY } SEE NOTE 2
94 — AUXILARY RELAY }
'HS' TEST — HAND SWITCH FOR TESTING
UVD — UNDER VOLTAGE DEVICE (TRIPS BREAKER ON UNDERVOLTAGE)
ARTS — ANTICIPATORY REACTOR TRIP SWITCH
RPS — REACTOR PROTECTION SYSTEM

ESSENTIAL (1E) CHANNEL 1,2,3,4
NON ESSENTIAL (NON-1E) CHANNEL A,B

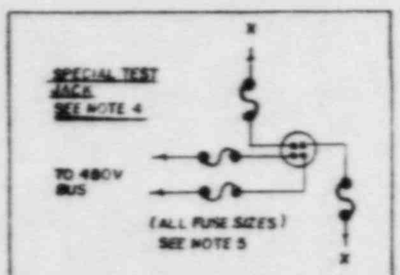
NOTES

1. TEST SWITCH SHOWN IN NORMAL POSITION
2. AGASTAT TYPE GP RELAY
3. CONTACTS A,B,C,D CORRESPOND TO RPS CHANNELS 2,1,4,3 RELAYS IN REACTOR TRIP MODULE
4. CROUSE HINDS RECEPTACLE RPC217-014-S09A
   PLUG CAT. # RPC117-150-P09A
   (FOR USE IN RESPONSE TIME TESTING OF THE BREAKER)
5. FUSE SIZE TO BE COORDINATED IN DETAILED DESIGN
6. DIODE TO SUPPRESS COIL DEENERGIZATION TRANSIENT

TEST SWITCH CONTACT DEVELOPMENT

CONTACT	UV TRIP TEST	NORMAL	SHUNT TRIP TEST	DWG.
1		X	X	THIS
2	X			SPARE
3	X	X		THIS
4			X	SPARE

TEST SWITCH KEY OPERATED (CODED)
GE TYPE CR2940YN203T1

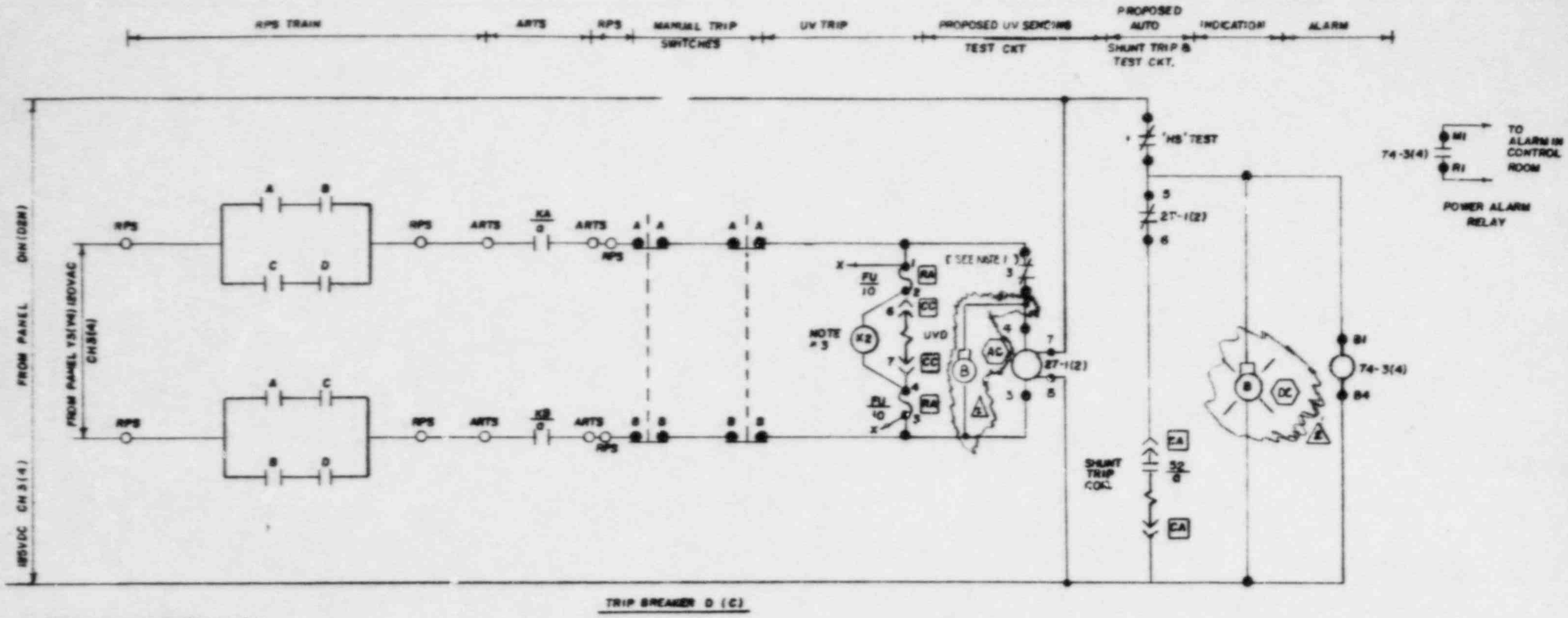


REV	DATE	REVISION	BY	CHKD	APPL
2	5-1-84	NO LAMP/DIODE	JLH	MAK	
1	4-5-84	CDIBRH	JLH	MAK	

THE TOLEDO EDISON CO.
DAVIS-BESSE NUCLEAR STATION
UNIT 1

SCHEMATIC DIAGRAM
REACTOR TRIP CIRCUIT BREAKER

DRAWN BY	JLH	APPROVED BY
CHECKED BY	MAK	
DATE 1-25-84	NO. 26570-2	



TEST SWITCH CONTACT DEVELOPMENT

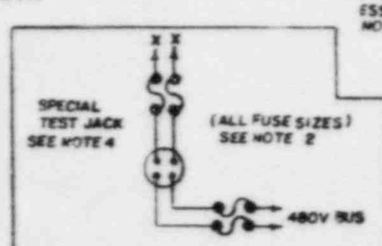
CONTACT	UV TRIP TEST	NORMAL	SHUNT TRIP TEST	DWG.
1		X	X	THIS
2	X			SPARE
3	X	X		THIS
4			X	SPARE

NOTE

1. CONTROL SWITCH SHOWN IN NORMAL POSITION
2. FUSE SIZE TO BE COORDINATED IN DETAILED DESIGN
3. RELAY K2 TRIGGERS THE ELECTRONIC TRIP ON BREAKER D (C)
4. CROUSE HINDS RECEPTACLE RPC 217-014-S09A
   PLUG CAT RPC 117-150-P09A
   (FOR USE IN RESPONSE TIME TESTING OF THE BREAKER)

LEGEND

27 — UNDERVOLTAGE SENSOR ITE-27H-210
74 — ALARM RELAY
'HS' TEST — HAND SWITCH FOR TESTING
UVD — UNDER VOLTAGE DEVICE (TRIPS BREAKER ON UNDERVOLTAGE)
ARTS — ANTICIPATORY REACTOR TRIP SYSTEM
RPS — REACTOR PROTECTION SYSTEM
ESSENTIAL (IE) CHANNEL 1,2,3,4
NON ESSENTIAL (NON-IE) CHANNEL A, B



REV	DATE	REVISION	DR	CHKD	APPD
2	5-13-84	Lamp			
1	9-30-84				

THE TOLEDO EDISON CO.
DAVIS-BESSE NUCLEAR STATION
UNIT 1

SCHEMATIC DIAGRAM
REACTOR TRIP CIRCUIT BREAKER

DRAWN BY JLH — APPROVED BY
CHECKED BY
DATE: -23-84 — NO. 26371-2