



SEP 23 2009

L-PI-09-100
10 CFR 50.90

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Supplement to License Amendment Request (LAR) to Apply Surveillance Requirement (SR) 3.0.2 Interval Extension to SR 3.8.1.8 (TAC Nos. ME0811 and ME0812)

- References:
1. Letter from Northern States Power Company, a Minnesota corporation (NSPM) to the Nuclear Regulatory Commission (NRC), "License Amendment Request (LAR) to Apply Surveillance Requirement (SR) 3.0.2 Interval Extension to SR 3.8.1.8", dated March 5, 2009, ADAMS Accession Number ML090641102.
 2. Prairie Island Nuclear Generating Plant, Units 1 and 2 Request for Additional Information Related to License Amendment Request to Apply Surveillance Requirement (SR) 3.0.2 Interval Extension to SR 3.8.1.8 (TAC Nos. ME0811 and ME0812), dated August 18, 2009, ADAMS Accession Number ML092250428.

In Reference 1, NSPM, doing business as Xcel Energy, submitted an LAR for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, to revise Technical Specification (TS) 3.8.1, "AC Sources – Operating," SR 3.8.1.8 Frequency to allow use of the SR 3.0.2 interval extension. In Reference 2, NRC Staff requested additional information to support their review of Reference 1. The Enclosure 1 to this letter provides the responses to the NRC Staff requests for additional information. NSPM submits this supplement in accordance with the provisions of 10 CFR 50.90.

The supplemental information provided in this letter does not impact the conclusions of the Determination of No Significant Hazards Consideration and Environmental Assessment presented in the March 5, 2009 submittal as supplemented April 13, 2009.

In accordance with 10 CFR 50.91, NSPM is notifying the State of Minnesota of this LAR supplement by transmitting a copy of this letter to the designated State Official.

If there are any questions or if additional information is needed, please contact Mr. Dale Vincent, P.E., at 651-388-1121.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments

I declare under penalty of perjury that the foregoing is true and correct.

Executed on **SEP 23 2009**



Mark A. Schimmel
Site Vice President
Prairie Island Nuclear Generating Plant, Units 1 and 2
Northern States Power Company - Minnesota

Enclosures (1)

cc: Administrator, Region III, USNRC
Project Manager, PINGP, USNRC
Resident Inspector, PINGP, USNRC
State of Minnesota

Enclosure 1

Nuclear Regulatory Commission (NRC) request for additional information (RAI) 1.) According to Surveillance Requirement (SR) 3.8.1.8.c of the Prairie Island Nuclear Generating Plant (PINGP) Technical Specifications (TS), the ground fault trip is not bypassed on an actual or simulated safety injection signal, in Unit 1 only. Explain the difference between Unit 1 and Unit 2 regarding this trip and provide the basis for not bypassing the ground fault trip for Unit 1.

Northern States Power Company, a Minnesota corporation (NSPM) response:

The emergency diesel generators (EDGs) for the two Prairie Island Nuclear Generating Plant (PINGP) units were installed at different times and manufactured by different companies to different specifications. The Unit 1 EDGs (D1 and D2) were installed as original plant equipment to support both Units 1 and 2 which became operational in December 1973 and December 1974, respectively. The Unit 1 EDG design was compared with the guidance of Safety Guide 9, issued in March 1971, which discussed overspeed protection, but does not provide specific guidance for critical trips. The original design of the Unit 1 EDGs provided protection from significant electrical failures during a safety injection event which included generator differential and ground fault protection as detected by a diesel output circuit breaker. Specific test requirements for the bypass relay were first introduced in the PINGP TS by license amendments (LA) 25 and 19, for Units 1 and 2 respectively, issued January 18, 1978. The surveillance requirement in this LA required verification that the engine overspeed and generator differential current are automatically bypassed. Subsequently in LAs 49 and 43, for Units 1 and 2 respectively, dated July 28, 1981, the NRC issued a revision of the EDG trip test "to include a trip of the diesel generator on occurrence of a ground fault, as well as engine overspeed and generator differential current in the list of trips that are not automatically bypassed on receipt of a safety injection signal. The proposed change clarifies the TS to be consistent with the previously existing diesel generator design."

The Unit 2 EDGs (D5 and D6) were installed in the early 1990s in response to the station blackout rule and became operational in 1992. These EDGs were designed to meet the requirements of Regulatory Guide (RG) 1.9, Revision 2. The critical trips on Unit 2 EDGs (D5 and D6) are based on the guidance in RG 1.9, Revision 2 which discusses trips of the diesel generators based on overspeed conditions or a generator differential in order to protect the EDGs from damage or degradation.

NRC RAI 2.) Submit for the NRC staff's review, the applicable portions of representative procedures for performing SR 3.8.1.8 and relevant representative drawings showing the relays that provide the function to bypass the emergency diesel generator non-critical automatic trips on an actual or simulated safety injection signal. Also, discuss whether critical trips are tested as part of SR 3.8.1.8 or some other plant procedure.

NSPM response:

The procedures for performing SR 3.8.1.8 are SP-1150 (D1), SP-1306 (D2), SP-2150 (D5), and SP-2306 (D6). SP-1150 and SP-2306 are attached for review as a representative procedure for each unit. Additionally, as requested, representative logic drawings for each unit showing how the MCA (Maximum Credible Accident) and SIMR (Safety Injection Master Relay) relays operate, and bypass the non-critical trips during a safety injection signal, are attached.

The critical trips (engine overspeed, generator differential current, and ground fault (Unit 1 only)) are not tested as a part of surveillance procedures SP-1150, SP-1306, SP-2150, and SP-2306.

The proper operation of the components that perform these critical trips are tested during routine maintenance. The generator differential current and ground fault (Unit 1 only) trips are tested as a part of the relay calibration procedures for each EDG. The diesel generator relay calibration and functional testing procedures test the generator differential relays and the ground fault relays (Unit 1 only) to verify that each will properly actuate the respective diesel generator lockout relays. These relay calibration procedures are performed on a four year frequency. The proper operation of the overspeed trip function is verified during the routine diesel generator inspection procedures which are performed on a two year frequency.

Attachments

1. SP-1150
2. SP-2306
3. NF-40325-1
4. NF-118850
5. NF-118858

Attachment 1

SP-1150, D1 Diesel Generator Relay Functional Test

SP	D1 DIESEL GENERATOR RELAY FUNCTIONAL TEST	NUMBER: SP 1150
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SYSTEMS:	D1, E1
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WO: _____

RESULTS/COMMENTS:	
Work Request Initiated: YES _____ NO _____ No. _____	

Test Performance:

Performed By: _____ Date: _____
(Signature or Initials)

Additional Requirements:

NONE

SP Completion:	
Shift Supervisor: _____	Date: _____
SP Surveillance Schedule Satisfied. YES/NO Surv. Admin: _____	

Other Actions for Consideration:

System Engineer Review: _____ Date: _____

PORC REVIEW DATE: NR	OWNER: P. Zamarripa	EFFECTIVE DATE 4/14/08
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SP	D1 DIESEL GENERATOR RELAY FUNCTIONAL TEST	NUMBER: SP 1150
		REV: 24
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1.0 PURPOSE AND GENERAL DISCUSSION

CONTINUOUS USE

- *Continuous use of procedure required.*
- *Read each step prior to performing.*
- *Mark off steps as they are completed.*
- *Procedure SHALL be at the work location.*

- 1.1 This test fulfills T.S. SR 3.8.1.8 requirements that the diesel generator system trips are automatically bypassed on a safety injection signal (except, for engine overspeed, ground fault and generator differential current).
- 1.2 This test provides post-maintenance testing for relays T3A and TDR5 for maintenance performed in PM 3001-4-D1. The D1 Diesel Generator is isolated during this test, this prevents starting and stopping the diesel.
- 1.3 This test is to be performed every 24 months in conjunction with PM 3001-2-D1 and PM 3001-4-D1.
- 1.4 Steps in this procedure that are not acceptance criteria (not asterisked) are to be observed and inconsistencies noted. If there is significant deviation or questions as to the operability, contact the Shift Supervisor or System Engineer for guidance.
- 1.5 **Acceptance Criteria**

General

In the event Acceptance Criteria (designated with an *) cannot be met, refer to Ops. Manual Section G, Surveillance and Periodic Test Program, for additional guidance.

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1.6 Acceptance Criteria - D1

1.6.1 Verify that energizing the safety injection (MCA) Relay causes the following diesel trips to be blocked:

- Low Lube oil pressure (Steps 7.11.2, 7.11.3)
- High jacket coolant temperature (Steps 7.11.2, 7.11.3)
- High crankcase pressure (Steps 7.11.2, 7.11.3)
- Reverse current relay (67X) (Step 7.8.3)

1.6.2 Verify that the following conditions lock out the diesel:

- Low lube oil pressure (Steps 7.14.4, 7.14.5)
- High jacket coolant temperature (Steps 7.14.4, 7.14.5)
- High crankcase pressure (Steps 7.14.4, 7.14.5)

1.6.3 Verify that energizing the EMERGENCY GEN 86 RELAY locks out the engine. (Step 7.17.4)

1.6.4 During the performance of this test, the D1 Diesel Generator and the Bus 15 sequencer are in Technical Specification Condition/Action Statements, therefore, if any part of the acceptance criteria is not met:

- Notify the System Engineer
- Write a WO.

2.0 REFERENCES

2.1 SR 3.8.1.8, Perform every 24 months

2.2 T.S.3.8.1, AC Sources-Operating

2.3 T.S.3.8.2, AC Sources-Shutdown

2.4 T.S.3.3.4, 4kV Safeguards Bus Voltage Instrumentation

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2.5 Preventive Maintenance Procedure:

2.5.1 PM 3001-2-D1, D1 Diesel Generator 18 Month Inspection. (D1 is logged out for this PM)

2.5.2 PM 3001-4-D1, D1 Diesel Generator Electrical Inspection. (D1 Relays are tested for this PM)

2.6 Wiring Diagram: XH-28-46, Connection Diagram D1 Power Unit

2.7 Tech Manual: XH-28-44, Diesel Generator Set

2.8 Electrical Schematics:

2.8.1 NE-40006 SH 41 & 81, Diesel Generator Voltage, Frequency Detection and Undervoltage

2.8.2 NF-40009 SH 72, 73, 74, 75 & 79 D1 Emergency Generator

2.8.3 NF-40253 SH 1 & 2, Wiring Diagram D-1 Emergency Generator Control Panel

2.9 Logic Diagrams:

2.9.1 NF-40325-1, -2, D1 Diesel Generator Control Logic

2.9.2 NF-40019-7, D1 Emergency

2.10 Operations Procedures: C20.5-1, 4.16KV Breaker Rack Out/Rack In

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Plan activities in advance to prevent relays and solenoids from being energized for an extended period of time.

3.2 This procedure **SHALL NOT** be performed in Mode 5, Cold Shutdown or Mode 6, Refueling, when the Bus 15 Load sequencer is credited for compliance with T.S. LCO 3.8.2.

3.3 Treat all terminal block and relay terminals as energized at 120VAC or 125VDC.

3.4 Bus 15 is most likely energized at 4KV.

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4.0 PERSONNEL AND SPECIAL EQUIPMENT REQUIREMENTS

4.1 Suggested Personnel

- 4.1.1 One (1) Control Room Operator - to record data and do manual operations.
- 4.1.2 Two (2) Electrical Maintenance Personnel - to perform electrical manipulations

4.2 Special Equipment

- 4.2.1 One (1) Voltmeter
- 4.2.2 Bypass jumpers with banana plug ends.

5.0 SPECIAL CONSIDERATIONS

- 5.1 Load Sequencer must be taken out of service for this inspection. The bus is placed in an analyzed condition per this WO for SI block loading prior to the load sequencer being placed in "MANUAL." This ensures the bus is in an operable condition.
- 5.2 All Train B required features supported by D2 Diesel Generator are required to be operable while in this test. IF any required Train B features become inoperable, THEN evaluation per 5AWI 3.15.8, Safety Function Determination Program **SHALL** be performed.
- 5.3 If voltage is lost to BUS 15, operator action is required to restore power to BUS 15 per 1C20.5 AOP1.
- 5.4 Banana plug bypass jumpers should be used to minimize the risk of shorting adjacent terminals during connection. (Reference T-Track item RCE 52.) Test equipment leads with banana plug connectors should be used whenever banana jacks are available.

6.0 PREREQUISITES AND INITIAL CONDITIONS

- 6.1 D1 Diesel Generator is tagged out per PM-3001-4-D1 (except for BKR 15-2 ground truck and **CS-46935**).
- 6.2 D1 Diesel Generator is logged out per PM-3001-2-D1.

 OPS

 OPS

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6.3 D1 local annunciator, ENGINE OVERSPEED, is LIT (indicating the fuel racks are tripped).

6.4 BUS 15 and BUS 16 must be powered from separate offsite sources. **Verify** one of the following and **NA** the other:

- IF BUS 15 is being powered from **BKR 15-3** (Reserve Aux Xfmr), THEN BUS 16 must be powered from **BKR 16-8** (Cooling Tower Xfmr).

OPS

- IF BUS 15 is being powered from **BKR 15-7** (Cooling Tower Xfmr), THEN BUS 16 must be powered from **BKR 16-2** (Reserve Aux Xfmr).

OPS

6.5 **Verify** Grid Voltage alarm limits are appropriate for the electrical configuration (**refer** to C20.3).

OPS

6.6 **Verify** that the following control switches in "SLOW."

CS-46018, 11 CNTMT FAN COIL UNIT

OPS

CS-46019, 13 CNTMT FAN COIL UNIT

OPS

6.7 **Verify** one of the following and **NA** the other:

- **CS-49010**, 121 AIR COMPR PRFRD/1STBY/2STBY in "PREFERRED"

OPS

or

- **CS-46096**, 121 AIR COMPR START/STOP, in "PULLOUT"

OPS

6.8 IF MCC 1T1 is powered from BUS 112, THEN **verify** 121 Control Room Water Chiller is running.

OPS

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7.0 PROCEDURE**NOTE:**

All steps are to be performed by electricians unless otherwise noted.

7.1 Conduct a pre-job briefing per PINGP 1112.

7.2 Take BUS 15 Load Sequencer out of service.

NOTE:

In Mode 1, Power Operation, Mode 2, Startup, Mode 3, Hot Standby, and Mode 4, Hot Shutdown T.S.3.3.4, 4kV Safeguards Bus Voltage Instrumentation, Condition C is entered, in Mode 5, Cold Shutdown, and Mode 6, Refueling, T.S.3.3.4, Condition E is entered, due to Bus 15 Load Sequencer out of service.

7.2.1 IF in Mode 1, Power Operation, Mode 2, Startup, Mode 3, Hot Standby or Mode 4, Hot Shutdown, THEN notify the Shift Supervisor T.S. LCO 3.3.4 is NOT met and **enter** CONDITION C.

Entered CONDITION C at:

time

Add Four (4) Hours

+ 4 hours

IF LCO 3.3.4 Condition C for Bus 15 Load Sequencer is NOT exited by entry time + 4 hours, THEN SP 1095 Bus 16 Load Sequencer Test **SHALL** be performed starting at:

=

hours

On

/ /
MM DD YR

7.2.2 Hang Caution tag per Clearance Order for the SS on **CS-46932**, BUS 15 VOLTAGE RESTORATION SEL SW.

OPS

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7.2.3 Inside BUS 15 Load Sequencer cabinet, place BUS 15 Load Sequencer switch **SW8** in "TEST."

7.2.4 Verify indicating light, LT2, BLOCKING RELAYS ENERGIZED, is ON.

NOTE:

The following steps, unless otherwise noted, are performed at the Local Relay Panel on D1 Skid.

NOTE:

The following lifted wire is functionally verified back in place during the start failure testing in PM 3001-2-D1 by Annunciator 47024-0703 Coming ON.

7.3 Lift wire **2M** at Relay **62TD2** to prevent **62TD2** from picking up **62XTD2** (Terminal 6 of 62TD2/D1 - Dwg XH-28-46 & NE-40009-74).

7.4 Manually **pick up** and hold **MCA** Relay (Clark Relay) located in D1 EMER GEN Relay Cabinet in D1 Room for the next step.

7.5 Depress **CS-55021**, D1 DSL GEN ALM AND SHTDN RESET PB, at D1 Diesel Gauge Panel to verify SDR Relay is reset.

7.6 Release **MCA** Relay and verify it remains energized.

7.7 Place **CS-46935**, D1 DIESEL GENERATOR, in "NEUTRAL" on G1 Panel.

OPS

7.8 **Perform** the following:

7.8.1 Verify EMERGENCY GEN LOCKOUT RELAY **86** is reset at D1 EMER GEN Relay Cabinet in D1 Room (red flag not visible).

7.8.2 Install a jumper from wire **67X-P22** (NF-40172, TB on right side of cabinet) to wire **D1-RT1** (below 67X-P22 on TB) to bypass the **67X/GGP** relay (NE-40006-81).

* 7.8.3 Verify relay **86/D1**, D1 Emergency Generator Lockout, does NOT actuate (red flag not visible).

7.8.4 Remove jumper from wire **67X-P22** (NF-40172, TB on right side of cabinet) to wire **D1-RT1** (below 67X-P22 on TB).

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NOTE:

Due to circuit design, testing the low lube oil pressure circuit to show the MCA relay will block trip due to low lube oil pressure also verifies the MCA relay will block trips from high jacket coolant temperature and high crankcase pressure.

- 7.9 Verify local Annunciator **55300-0104**, LUBE OIL PRESSURE LOW, is Not ON.
-

NOTE:

The following step may cause several alarms to come in.

- 7.10 Place a jumper between wire **2C (TB-B10)** and wire **D1 - 1P (TB-B2)** to energize T3A (enables Raw Water Press Low Local Annun. and shutdown circuitry), located in generator relay box **D1-3** (Dwg XH-28-46 & NE-40009-73). (Will be removed in Step 7.18.)
-
- 7.11 Verify **MCA** Relay is preventing engine shutdown from low lube oil pressure.
- 7.11.1 In the D1 Relay Cabinet, connect a voltmeter between wires **D1 - 1P (TB-B2)** and **2H** (Terminal 2 of Relay 5A) to monitor signals to the governor shutdown solenoid (Dwg XH-28-46 & NE-40009-74).
-
- * 7.11.2 Verify OPEN circuit voltage on meter (approx. 130VDC).
-
- * 7.11.3 Verify local Annunciator **55300-0104**, LUBE OIL PRESSURE LOW, is ON.
-
- 7.11.4 Lift wire **2V (TB-10)** to disable the engine low lube oil pressure trip (Dwg XH-28-46 & NE-40009-74). (Will be reterminated in Step 7.17)
-
- 7.11.5 Verify **55300-0104**, LUBE OIL PRESSURE LOW alarm is Not ON.
-
- 7.12 Reset **MCA** Relay from G1 Panel using **CS-46967**, D1 DSL GEN SI MCA RESET.
-

OPS

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7.13 In BUS 15 Room, place **BKR 15-2**, BUS 15 SOURCE FROM D1 DSL GEN, in "TEST" as follows:

7.13.1 Remove **BKR 15-2**, from the cubicle and install shutter barrier.

7.13.2 Put **BKR 15-2** back in the cubicle.

7.13.3 Place "Barrier Installed" tags on the racking mechanism of **BKR 15-2**.

7.13.4 Rack **BKR 15-2** to "TEST" per C20.5-1.

7.13.5 CLOSE DC knife switch for **BKR 15-2**.

7.13.6 Place **CS-46950**, BUS 15 SOURCE FROM D1 DSL GEN, in "NORMAL."

OPS

7.14 Verify the following condition locks out the engine and trips **BKR 15-2**, BUS 15 SOURCE FROM D1 DSL GEN.

7.14.1 CLOSE **BKR 15-2** using the **CLOSE** pushbutton on the breaker face inside cabinet above manual closure lever.

7.14.2 Momentarily (1 to 3 seconds) place a jumper between wire **3E** and **2T (TB-B10)** to energize relay CCR (simulate high crankcase pressure) in Gen Relay Box **D1-3** (XH-28-46 & NE-40009-74).

7.14.3 Remove jumper between wire **3E** and **2T (TB-B10)** to de-energize relay CCR.

* **7.14.4** Reset **SDR** relay by depressing **CS-55021**, D1 DSL GEN ALM AND SHTDN RESET PB, at D1 Diesel Gauge Panel.

* **7.14.5** Verify EMERGENCY GEN LOCKOUT RELAY **86** is TRIPPED at D1 EMER GEN Relay Cabinet in D1 Room (red flag visible).

7.14.6 Reset EMERGENCY GEN LOCKOUT RELAY **86** at D1 EMER GEN Relay Cabinet in D1 Room (red flag not visible).

7.14.7 At **BKR 15-2** cubicle, verify **BKR 15-2** is OPEN.

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7.15 In BUS 15 Room, place **BKR 15-2**, in "DISCONNECT" as follows:

7.15.1 Place **CS-46950**, BUS 15 SOURCE FROM D1 DSL GEN, in "PULLOUT."

OPS

7.15.2 OPEN DC knife switch for **BKR 15-2**.

7.15.3 Rack **BKR 15-2**, to "DISCONNECT" per C20.5-1.

7.15.4 Remove **BKR 15-2**, from the cubicle.

7.15.5 Remove shutter barrier from cubicle.

7.15.6 Place **BKR 15-2**, to locked "DISCONNECT".

7.15.7 Remove "Barrier Installed" tag from the racking mechanism of **BKR 15-2**.

7.16 Return BUS 15 Load Sequencer to Service as follows:

7.16.1 Remove Secure Tag per Tag Section hung in Step 7.2.2.

Tag Section _____

OPS

7.16.2 Place **CS-46932**, BUS 15 VOLTAGE RESTORATION SEL SW, in "AUTO."

OPS

7.16.3 Inside the BUS 15 Load Sequencer cabinet, place BUS 15 Load Sequencer switch **SW8** to "NORM."

7.16.4 Verify Annunciator **47024-1001**, BUS 15 SEQUENCER NOT IN SERVICE, is Not ON.

OPS

7.16.5 Notify the Shift Supervisor to exit T.S. LCO 3.3.4 CONDITION C or E entered in Step 7.2.1.

Time of LCO Exit: _____

time

Exited CONDITION C at: _____

time

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7.16.6 Return the following 480V loads to a status as directed by Shift Supervisor:

- A. 121 Air compressor
- B. 11 CFCU
- C. 13 CFCU
- D. 121 Control Room Chiller

OPS

NOTE:

The following step may cause several alarms to come in.

7.17 Verify the following conditions lockout the engine:

7.17.1 Momentarily (1 to 3 seconds) place a jumper between wires **3C** and **2T (TB-B10)** to energize relay CTH (simulate high jacket coolant temperature) in Gen Relay Box **D1-3** (Dwg XH-28-46 & NE-40009-74).

7.17.2 Remove jumper between wires **3C** and **2T (TB-B10)** to de-energize relay CTH.

7.17.3 Reset **SDR** Relay by depressing **CS-55021**, D1 DSL GEN ALM AND SHTDN RESET PB, at D1 Diesel Gauge Panel.

* **7.17.4** Verify EMERGENCY GEN LOCKOUT RELAY **86** is TRIPPED at D1 EMER GEN Relay Cabinet in D1 Room (red flag is visible).

7.17.5 Reset EMERGENCY GEN LOCKOUT RELAY **86** at D1 EMER GEN Relay Cabinet in D1 Room (red flag not visible).

7.17.6 Reterminate wire **2V (TB-B10)**, that was lifted in Step 7.11.4, to enable low oil pressure to trip the engine (Dwg XH-28-46).

7.17.7 Perform Independent Verification that wire **2V (TB-B10)** is reterminated.

IV

7.17.8 Verify EMERGENCY GEN LOCKOUT RELAY **86** is TRIPPED at D1 EMER GEN Relay Cabinet in D1 Room (red flag is visible).

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7.18 Remove jumper, that was placed in Step 7.10, between wires **2C (TB-B10)** and **D1 - 1P (TB-B2)** to de-energize T3A (Dwg XH-28-46) in Gen Relay Box **D1-3**.

7.19 Reset **SDR** Relay by depressing **CS-55021**, D1 DSL GEN ALM AND SHTDN RESET PB, at D1 Diesel Gauge Panel.

NOTE:

The following step verifies the shutdown solenoid is still energized after 5 TDR times out after 3 minutes. 5 TDR should not start counting time until the 86 relay is reset. This verifies EMERGENCY GEN LOCKOUT RELAY 86 will lockout the diesel.

7.20 After approximately four (4) minutes, verify CLOSED circuit voltage on meter (approx. 0VDC).

7.21 Reset EMERGENCY GEN LOCKOUT RELAY **86** at D1 EMER GEN Relay Cabinet in D1 Room (red flag not visible).

7.22 Verify OPEN circuit voltage on meter after about 3 minutes (approx. 125VDC).

7.23 Remove meter leads connected from **2H** to **D1 - 1P** (Dwg XH-28-46).

7.24 Reterminate wire **2M** to relay **62/TD2** (terminal 6 of **62/TD2D1** – Dwg XH-28-46).

7.25 Perform Independent Verification wire **2M** to relay **62/TD2** is reterminated.

IV

7.26 Place **CS-46935**, D1 DIESEL GENERATOR, in "PULLOUT" on G1 Panel.

OPS

7.27 Notify the Control Room that the test has been completed.

7.28 Complete a Calibrated Tool Usage Form and attach.

ELECT

7.29 Return to PM 3001-4-D1.

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8.0 ADDITIONAL REQUIREMENTS

NONE

9.0 ATTACHMENTS

NONE

Attachment 2

SP-2306, D6 Diesel Generator Relay Functional Test

<div style="font-size: 48pt; font-weight: bold; text-align: center;">SP</div>	<div style="text-align: center;"> <div style="font-weight: bold;">D6 DIESEL GENERATOR RELAY FUNCTIONAL TEST</div> </div>	<div style="text-align: right;">NUMBER:</div> <div style="text-align: right; font-weight: bold;">SP 2306</div>
		<div style="text-align: right;">REV:</div> <div style="text-align: right; font-weight: bold;">11</div>
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SYSTEMS:	D6
-----------------	----

Wo: _____

RESULTS/COMMENTS:	
<p>Work Request Initiated: YES _____ NO _____ No. _____</p>	

Test Performance:

Performed By: _____ Date: _____
(Signature or Initials)

Additional Requirements:

NONE

SP Completion: _____
Shift Supervisor: _____ Date: _____
SP Surveillance Schedule Satisfied. YES/NO Supv. Admin: _____

Other Actions for Consideration:

System Engineer Review: _____ Date: _____

PORC REVIEW DATE:	OWNER:	EFFECTIVE DATE
NR	P. Zamarripa	10/15/07

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1.0 PURPOSE AND GENERAL DISCUSSION

CONTINUOUS USE
<ul style="list-style-type: none">• <i>Continuous use of procedure required.</i>• <i>Read each step prior to performing.</i>• <i>Mark off steps as they are completed.</i>• <i>Procedure SHALL be at the work location.</i>

1.1 Purpose

- 1.1.1 This procedure is performed every 24 months to meet the requirements of T.S. SR 3.8.1.8.
- 1.1.2 This functional test verifies that the D6 Diesel Generator System trips, except for those for engine overspeed, and the generator differential current trip are automatically bypassed with a safety injection signal.
- 1.1.3 This diesel generator test consists of:
 - A. Verification that energizing the SIMR Relay blocks a diesel trip from the following conditions:
 - HT Cooling Water High-High Temperature
 - Lube Oil High-High Temperature
 - Low Oil Pressure
 - High Crankcase Pressure
 - HT Cooling Water Low Pressure
 - LT Cooling Water Low Pressure
 - Voltage Restrained Overcurrent
 - Loss of Excitation
 - Overvoltage

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- Overcurrent
- Generator Bearing High Temperature
- Electronic Governor Fuel Rack RDD Failure

B. Verification that energizing the SIMR Relay blocks trip of Breaker 26-16 on a Reverse Current signal.

1.2 Acceptance Criteria - General

1.2.1 General

In the event Acceptance Criteria cannot be met, refer to Ops. Manual Section G, "SURVEILLANCE AND PERIODIC TEST PROGRAM" for additional guidance.

1.2.2 Diesel Generator Trips

A. The energized SIMR Relay blocks a diesel trip from the following conditions:

- HT Cooling Water High-High temperature
- Lube Oil High-High Temperature
- Low Oil Pressure
- High Crankcase Pressure
- HT Cooling Water Low Pressure
- LT Cooling Water Low Pressure
- Voltage Restrained Overcurrent
- Loss of Excitation
- Overvoltage
- Overcurrent
- Generator Bearing High Temperature
- Electronic Governor Fuel Rack RDD Failure

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- B. The energized SIMR Relay blocks a trip of Breaker 26-16 on a Reverse Current signal.
- C. IF the energized SIMR Relay does not block any of the above signals THEN:
 - 1. Notify the System Engineer
 - 2. Write a Work Request.

1.3 General Discussion

- 1.3.1 Every step identified by an asterisk (*) must be acceptable for this test to be acceptable. IF any acceptance step is not met, THEN the Shift Supervisor **SHALL** be notified immediately.
- 1.3.2 Steps in this procedure that are not acceptance criteria (not asterisked) are to be observed and inconsistencies noted. If there is significant deviation or questions as to the operability, contact the Shift Supervisor or System Engineer for guidance.
- 1.3.3 Several steps of this procedure are required to be performed by Operations Personnel outside the Control Room, the steps **SHALL** be identified by a "pound sign" (#).

2.0 REFERENCES

2.1 Electrical Drawings:

- 2.1.1 NE-116786-30 "D6 Emergency Generator Bus 26 Cubicle 16"
- 2.1.2 NE-116757-2 through NE-116757-35 "D6 Emergency Generator Schematic Diagrams"
- 2.1.3 NE-120693-1 through NE-120693-3 "External Wiring Diagram D6 Diesel Gen. Vertical Panel"
- 2.1.4 NR-156981 Series, Internal Wiring Diagram D6 DG Vertical Panels
- 2.1.5 XH-2713-10 Series, Load Sequencer

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2.2 Tech Specs:

2.2.1 T.S. SR 3.8.1.8

2.2.2 T.S.3.8.1, AC Sources-Operating

2.2.3 T.S.3.8.2, AC Sources-Shutdown

2.2.4 T.S.3.3.4, 4kV Safeguards Bus Voltage Instrumentation

N 2.3 Generic Letter 96-01, Testing of Safety Related Logic Circuits

2.4 Implementing Procedures:

2.4.1 C20.5-1, 4KV Breaker Rack In/Rack Out Procedure

2.4.2 Safety Card Stock Isolation SP 2306

2.4.3 5AWI 8.7.0, Foreign Material Exclusion Program Description

3.0 PRECAUTIONS AND LIMITATIONS

3.1 When resetting the 86 D6 GEN LOCKOUT do not leave the switch in the reset position any longer than needed to avoid burning out the coil. Plan activities well in advance to prevent keeping relays and solenoids energized for an extended period of time.

3.2 This procedure **SHALL NOT** be performed in Mode 5, Cold Shutdown or Mode 6, Refueling, when the Bus 26 Load Sequencer is credited for compliance with T.S. LCO 3.8.2.

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4.0 PERSONNEL AND SPECIAL EQUIPMENT REQUIREMENTS

4.1 Suggested Personnel

- 4.1.1 One (1) Control Room Operator - to record data and do manual operations
- 4.1.2 Two (2) Electrical Maintenance Personnel - to perform electrical manipulations
- 4.1.3 Two (2) I&C Personnel - to perform Engine Pressure Trip Testing

4.2 Special Equipment

- 4.2.1 Key Hook No. 204, D5 or D6 MNTCE/NORM MOD SEL SW
- 4.2.2 Voltmeter
- 4.2.3 I&C valved air harness for D5/D6 Engine Pressure Trip Testing
- 4.2.4 Test jumpers with banana plug ends.

5.0 SPECIAL CONSIDERATIONS

- 5.1 Load sequencer must be taken out of service for this inspection. The bus is placed in an analyzed condition per this WR for SI block loading prior to the load sequencer being placed in manual. This ensures the bus is in an operable condition.
- 5.2 All Train A required features supported by D5 Diesel Generator are required to be operable while in this test. IF any required Train A features become inoperable, THEN evaluation per 5AWI 3.15.8, Safety Function Determination Program, **SHALL** be performed.
- 5.3 T.S.3.3.4, 4kV Safeguards Bus Voltage Instrumentation, specifies the Required Actions that must be completed when removing the load sequencer from service.
- 5.4 IF Voltage is lost to Bus 26, THEN operator action is required to restore power to the Bus 26 per 2C20.5 AOP2.
- 5.5 Steps preparing to take Bus 26 Sequencer OOS and installation of a shutter barrier in cubicle 26-16 may be done prior to pre-job brief.
- 5.6 For steps noting a wire number, it is acceptable to verify the wire number is physically connected where specified by tracing jumpers/wires internal to the associated panel. For example, IF an external wire is connected to terminal 1 AND terminal 1 is jumpered to terminal 10 AND terminal 10 is jumpered to terminal 15, THEN the external wire is considered to be connected to terminals 1, 10 and 15.

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5.7 Banana plug bypass jumpers should be used to minimize the risk of shorting adjacent terminals during connection. (Reference T-Track item RCE 52). Test equipment leads with banana plug connectors should be used whenever banana jacks are available.

5.8 Alligator clip end on bypass jumper must be used for times when banana plug connection is not available at a terminal block.

5.9 The following annunciators are expected during this test:

47524-0604 BUS 26 BKR 16 SOURCE FROM D6 EMERGENCY GEN CLOSED

47524-0605 D6 EMERGENCY GENERATOR SI SIGNAL EMERGENCY START

47524-0706 D6 EMERGENCY GENERATOR LOCKED OUT

47524-0804 BUS 26 SEQUENCER IN TROUBLE

47524-0806 D6 EMERGENCY GENERATOR SHUT DOWN

47524-0905 D6 EMERGENCY GENERATOR REVERSE POWER BKR TRIP

47524-1004 BUS 26 SEQUENCER NOT IN SERVICE

47524-1005 D6 EMERGENCY GENERATOR TRIP

ERCS:

2Y8092D D6 ENG1 FUEL OIL FEED PRESS LOW

2Y8093D D6 ENG2 FUEL OIL FEED PRESS LOW

Other ERCS alarms will be received for tested function.

6.0 PREREQUISITES AND INITIAL CONDITIONS

6.1 **Attach** completed white copy of Form 17-4048, Calibrated Tool Usage, to this procedure and **place** the yellow copy in the out basket.

6.2 D6 OOS for maintenance and logged OOS per LCO 3.8.1 OR LCO 3.8.2, as applicable.

OPS

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- 6.3 D6 Diesel Generator is isolated appropriately - Electrical
(Exceptions allowed for ground truck in 26-16, **BKR 26-16**, **BKR 8/M/D6**).

 OPS

- 6.4 **Generate** Stock Isolation SP 2306 D6 Diesel Generator Relay Functional Test.

 OPS

7.0 PROCEDURE

- 7.1 **Conduct** a pre-job brief using PINGP 1112.

NOTE:	The following steps, unless otherwise noted, are performed at D6 Vertical Panel.
--------------	----------------------------------------------------------------------------------

NOTE:	All steps are to be performed by electricians unless otherwise noted.
--------------	-----------------------------------------------------------------------

- 7.2 Verify a temporary lift has been performed as required for **BKR 26-16**, **CS-46944**, and DC control power to D6 Generator control circuits (**BKR 8/M/D6**). (**NA** if not required).

Temp Lift No.: _____

 PLANT ENG

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7.3 Take Bus 26 Load Sequencer Out of Service

NOTE:

Bus 25 and Bus 26 must be powered from separate offsite sources.

7.3.1 Verify one of the following (**NA** the unused step):

- A. IF Bus 25 is being powered from **BKR 25-16**, THEN
Bus 26 must be powered from **BKR 26-13**.

 OPS

OR

- B. IF Bus 25 is being powered from **BKR 25-5**, THEN
Bus 26 must be powered from **BKR 26-2**.

 OPS

- # 7.3.2 IF Bus 27 is powered from Bus 26, THEN perform
2C20.5 Section 5.18, to transfer Bus 27 to Bus 25 from
Bus 26.

 OPS

- 7.3.3 **Verify** Grid Voltage alarm limits are appropriate for the
electrical configuration (**refer** to C20.3).

 OPS

- 7.3.4 **Verify** the following control switches are in "SLOW:"

CS-46551, 22 CONTAINMENT FAN COIL SEL SW

 OPS

CS-46552, 24 CONTAINMENT FAN COIL SEL SW

 OPS

- 7.3.5 IF **MCC 1T2** is powered from Bus **222**, THEN **verify**
122 Control Room Water Chiller is running.

 OPS

AND

Verify 122 Control Room Air Supply Fan is running,
CS-46075.

 OPS

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7.3.6 Secure either 21 or 23 Charging Pump:

- A. IF the pump to be secured is running, THEN swap pumps per 2C12.1.

OPS

- B. **Place** Control Switch for the pump to be secured in PULLOUT:

CS-49550, 21 CHARGING PUMP_____
OPSOR**CS-49552**, 23 CHARGING PUMP_____
OPS**NOTE:**

In Modes 1, Power Operation, Mode2, Startup, Mode 3, Hot Standby, and Mode 4, Hot Shutdown T.S.3.3.4, 4kV Safeguards Bus Voltage Instrumentation, Condition C is entered, in Mode 5, Cold Shutdown, and Mode 6, Refueling, T.S.3.3.4, Condition E is entered, due to Bus 26 Load Sequencer out of service.

- 7.3.7** IF in Mode 1, Power Operation, Mode2, Startup, Mode 3, Hot Standby, or Mode 4, Hot Shutdown, THEN **notify** the Shift Supervisor T.S. LCO 3.3.4 is NOT met and **enter** CONDITION C.

Entered CONDITION C at: _____

time

- 7.3.8** **Place** **CS-46931**, BUS 26 VOLTAGE RESTORATION SEL SW, in "MANUAL."

OPS

- 7.3.9** **Hang** a Secure Tag per Tag Section 2-D6 SP2306-SS SP 2306, D6 DIESEL GENERATOR FUNCTIONAL TEST, for the SS. (Reference Master Tagout 2-D6 SP2306-SS)

OPS

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NOTE:

The following status lights and alarm will energize on the next step:

44324-0103, SEQUENCER IN TEST
 44324-0104, 2RY SOURCE TROUBLE
 44324-0105, CT12 SOURCE TROUBLE
 44324-0106, D6 SOURCE TROUBLE
 47524-0804, 26 SEQUENCER TROUBLE ALARM

7.3.10 In the Bus 26 Load Sequencer Cabinet, place Bus 26 Load Sequencer switch **SW8**, Blocking Relays, in "TEST." _____

7.3.11 Check **LT17**, BLOCKING RELAYS ENERGIZED, light is LIT (inside sequencer cabinet). _____

7.3.12 Check **LT2**, BLOCKING RELAYS ENERGIZED, light is LIT. _____

7.4 Simulate an Emergency Start Signal

* # **7.4.1** **Verify** the following switch positions to provide a current path to the **SIMR** Relay:

A. **CS-60208**, D6 DSL GEN CONTROL MODE SEL SW, in "NORMAL" _____

OPS

B. **CS-60210**, D6 ENG 1/ENG 2 START SEL SW, in "ENGINE 1 & 2" _____

OPS

C. **CS-60215**, D6 DSL GEN VOLTAGE REGULATOR MODE SEL SW, in "AUTO" _____

OPS

7.4.2 Place **BKR 26-16** in "TEST" as follows: _____

A. Remove **BKR 26-16** from the cubicle and install shutter barrier. _____

B. Install the breaker back in the cubicle and place "Barrier Installed" tags on the racking mechanism on **BKR 26-16**. _____

C. Place **BKR 26-16** in "TEST" per C20.5-1. _____

D. CLOSE the DC knife switch for **BKR 26-16**. _____

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- 7.4.3 Place **CS-46944**, BUS 26 SOURCE FROM D6, in "NORMAL."

OPS

- 7.4.4 On left side of Vertical Panel 4 lift lead at contact terminal 10 on **SFR** (wire SFR-10) Start Failure Relay to prevent picking up the **ESR** (Emergency Start Relays) when the SI start is simulated. (NE-116757 SH.2, NF-156981 Sh.3)

- N 7.4.5 On left side of Vertical Panel 4 connect one end of jumper to terminal 16 of **VP2-I** (wire D6-SIM2, goes to **SIMR**). (NE-116757-2 and NF-156981-3)

- N 7.4.6 Connect remaining lead to terminal 18 of **VP2-I** to energize **SIMR** (wire D6-ES1). (NE-116757-2 and NF-156981-3)

- * 7.4.7 Verify **86 D6 GEN LOCKOUT** is NOT TRIPPED or reset **86 D6 GEN LOCKOUT**.

- * 7.4.8 Verify EMERG START ACTUATED red light on **CS-46958**, D6 DSL GEN EMERG START & EMERG START RESET, is LIT at G2 Panel.

OPS

NOTE:

Due to circuit configuration, the **SIMR** block of the **86 LOR/D6** relay only has to be tested from one blocked trip source.

- 7.5 Verify the **SIMR** Relay blocks a diesel trip from the following conditions:

- N 7.5.1 Verify Annunciator **60001-0303**, HT CLG WTR TEMP HI-HI TRIP, is NOT LIT.

- N 7.5.2 In Panel 3, place jumper between terminals 11 (wire D6-WCS1P) & 14 (wire D6-WCS16) on terminal strip **VP3-L** to energize **HTWTS/E1** (NE-116757 Sh.23 & NF-156981 Sh.5).

- * 7.5.3 Verify Annunciator **60001-0303**, HT CLG WTR TEMP HI-HI TRIP is LIT.

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- * 7.5.4 Verify **86 D6 GEN LOCKOUT** relay is NOT TRIPPED. _____
- 7.5.5 Remove Jumper between terminals 11 & 14 on terminal strip **VP3-L** to de-energize **HTWTS/E1**. _____
- 7.6 Verify the SIMR Relay blocks a trip of **BKR 26-16** on a Reverse Current Signal.
- 7.6.1 CLOSE **BKR 26-16** using Test Close pushbutton on breaker. _____
- N 7.6.2 Verify Annunciator **60002-0203**, GENERATOR REVERSE POWER BREAKER TRIP, is NOT LIT. _____
- N 7.6.3 Place a jumper between terminals 12 & 13 on **Relay 32** to simulate a Reverse Current (Back of relay located in Panel 5 NE-116757, Sh.27 & NF-156981, Sh.15). _____
- * 7.6.4 Verify Annunciator **60002-0203**, GENERATOR REVERSE POWER BREAKER TRIP, is LIT. _____
- * 7.6.5 Verify **BKR 26-16** is NOT TRIPPED. _____
- 7.6.6 Remove jumper between terminals 12 & 13 on **Relay 32**. _____
- 7.7 Clear the Simulated Emergency Start Signal
- 7.7.1 In Panel 4, remove jumper from terminal 18 of **VP2-I** to de-energize **SIMR**. _____
- 7.7.2 Remove jumper from terminal 16 of **VP2-I**. _____
- 7.7.3 **Reset** the EMERG START signal by placing **CS-46958**, D6 DSL GEN EMERG START & EMERG START RESET, in "EMERG START RESET" at G2 Panel. _____
- 7.7.4 **Verify** EMERG START ACTUATED red light is NOT LIT on **CS-46958** at G2 Panel. _____
- OPS
- OPS

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7.8 Verify **BKR 26-16** trips on Reverse Current.

7.8.1 Verify Annunciator **60002-0203**, GENERATOR REVERSE POWER BREAKER TRIP, is NOT LIT. _____

7.8.2 Place a jumper between terminals 12 & 13 on **Relay 32** to simulate a Reverse Current (Back of relay located in Panel 5 NE-116757, Sh.27 & NF-156981, Sh.15). _____

* **7.8.3** Verify Annunciator **60002-0203**, GENERATOR REVERSE POWER BREAKER TRIP, is LIT. _____

7.8.4 Remove jumper between terminals 12 & 13 on **Relay 32**. _____

* **7.8.5** Verify **BKR 26-16** is OPEN. _____

7.8.6 Place **CS-46944**, BUS 26 SOURCE FROM D6 DSL GEN, in "PULLOUT." _____

OPS

7.8.7 Place **BKR 26-16** in "DISCONNECT" the following:

A. OPEN DC knife switch for **BKR 26-16**. _____

B. Remove **BKR 26-16** from the cubicle. _____

C. Remove Shutter Barrier from cubicle. _____

D. Place **BKR 26-16** to locked in "DISCONNECT" per C20.5-1. _____

E. Remove "Barrier Installed" tag from the **BKR 26-16** racking mechanism. _____

7.8.8 If applicable, **restore** from the Temp Lift established in Step 7.2.

Temp Lift No.: _____

OPS

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7.9 Return Bus 26 Load Sequencer to service as follows:

7.9.1 **Remove** Secure Tag hung by clearing Tag Section 2-D6 SP2306-SS SP 2306, D6 DIESEL GENERATOR RELAY FUNCTION TEST, for the SS."

OPS

7.9.2 **Place CS-46931**, BUS 26 VOLTAGE RESTORATION SEL SW, IN "AUTO".

OPS

7.9.3 In the Bus 26 Load Sequencer Cabinet, place Bus 26 Load Sequencer switch **SW8**, in "NORM."

7.9.4 **Verify** Annunciator **47524-1004**, BUS 26 SEQUENCER NOT IN SERVICE, is NOT LIT.

OPS

7.9.5 **Notify** the Shift Supervisor to exit T.S. LCO 3.3.4 CONDITION C or E, entered in Step 7.3.6.

Exited CONDITION C at:

time

7.9.6 **Return** the 480V loads per this SP to a status directed by the Shift Supervisor.

OPS

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7.10 Verify that the diesel locks out from the following conditions:

- N** **7.10.1** In Panel 3, momentarily place jumper between terminals 11 (wire D6-WCS1P) and 14 (wire D6-WCS16) on terminal strip **VP3-L** to energize **HTWTS/E1** (H.T. Cooling Water Temperature High-High) (NE-116757-23 and NF-156981-5). _____
- 7.10.2** Remove jumper between terminals 11 and 14 on terminal strip **VP3-L** to de-energize **HTWTS/E1**. _____
- * **7.10.3** Check **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.4** Reset **86 D6 GEN LOCKOUT**. _____
- 7.10.5** In Panel 3, momentarily place jumper between terminals 20 (wire D6-LOS1P) and 21 (wire D6-ELO19) on terminal strip **VP3-J** to energize **LOTR/E1** (Lube Oil Temp. High-High) (NE-116757-21 and NF-156981-5). _____
- 7.10.6** Remove jumper between terminals 20 and 21 on terminal strip **VP3-J** to de-energize **LOTR/E1**. _____
- 7.10.7** Verify **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.8** Reset **86 D6 GEN LOCKOUT**. _____

NOTE:

The following step will actuate Annunciator 60002-0402, DIESEL GEN SEL SW IN MAIN."

- 7.10.9** Using Key Hook 204, place **CS-60210**, D6 ENG 1/ENG 2 START SEL SW, in "ENGINE 1" to separate engine 1 and engine 2 pressure trips. _____

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- 7.10.10** Simultaneously apply pressure above setpoints to remove trip signals from the following Engine 1 devices.

I&C

Device Number	Name	Setpoint
6174	Lube Oil Pressure 1 Low/E1	43.5
6175	Lube Oil Pressure 2 Low/E1	43.5
6176	Lube Oil Pressure 3 Low/E1	43.5
6254	L.T. Cooling Water Pressure Low/E1	30.8
6202	H.T. Cooling Water Pressure Low/E1	30.8

NOTE:

The contacts of TEOS1 act as permissive for various pressure trips and various alarms.

- 7.10.11** In Panel 4, apply a jumper between terminal D of relay **TEOS1** (wire TEOS-1-D) and terminal 1 of **VP2-J** (wire D6-MP) to energize **TEOS1** (NE-116757-3 & NF-156981-3).

NOTE:

The following steps test the Lube Oil Pressure "Low-Low" 2/3 logic.

- 7.10.12** Reduce pressure below setpoint to simulate Lube Oil Pressure 1 Low/E1 (**6174**) which energizes **LOPI/E1**.

I&C

- 7.10.13** Reduce pressure below setpoint to simulate Lube Oil Pressure 2 Low/E1 (**6175**) which energize **LOP2/E1**.

I&C

- 7.10.14** Verify with Control Room that ERCS point **2Y8038D** indicates Lube Oil Pressure Low Low is in alarm.

- 7.10.15** Verify local Annunciator **60001-0105** is LIT.

- 7.10.16** Apply pressure above setpoint to Lube Oil Pressure 2 Low/E1 (**6175**) to de-energize **LOP2/E1**.

I&C

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7.10.17 Verify with Control Room that ERCS point **2Y8038D** clears.

7.10.18 Verify local Annunciator **60001-0105** is NOT LIT.

7.10.19 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

7.10.20 Reset **86 D6 GEN LOCKOUT**.

7.10.21 Reduce pressure below setpoint to simulate Lube Oil Pressure 3 Low/E1 (**6176**) which energizes **LOP3/E1**.

I&C

7.10.22 Apply pressure above setpoint to Lube Oil Pressure 1 Low/E1 (**6174**) to de-energize **LOP1/E1**.

I&C

7.10.23 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

7.10.24 Reset **86 D6 GEN LOCKOUT**.

7.10.25 Reduce pressure below setpoint to simulate Lube Oil Pressure 2 Low/E1 (**6175**) which energizes **LOP2/E1**.

I&C

7.10.26 Apply pressure above setpoint to Lube Oil Pressure 2 Low/E1 (**6175**) to de-energize **LOP2/E1**.

I&C

7.10.27 Apply pressure above setpoint to Lube Oil Pressure 3 Low/E1 (**6176**) to de-energize **LOP3/E1**.

I&C

7.10.28 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

7.10.29 Reset **86 D6 GEN LOCKOUT**.

7.10.30 Reduce pressure below setpoint to simulate H.T. Cooling Water Pressure Low1 (**6202**) which energizes **HTWR/E1**.

I&C

7.10.31 Apply pressure above setpoint to H.T. Cooling Water Pressure Low (**6202**) to de-energize **HTWR/E1**.

I&C

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- 7.10.32 Verify **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.33 Reset **86 D6 GEN LOCKOUT**. _____
- 7.10.34 Reduce pressure below setpoint to simulate L.T. Cooling Water Pressure Low (**6254**) which energizes **LTWR/E1**. _____
I&C
- 7.10.35 Apply pressure above setpoint to L.T. Cooling Water Pressure Low (**6254**) to de-energize **LTWR/E1**. _____
I&C
- 7.10.36 Verify **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.37 Reset **86 D6 GEN LOCKOUT**. _____
- 7.10.38 In Panel 3, momentarily place jumper between terminals 10 (wire D6-ELO11) and 11 (wire D6-ELO13) on terminal strip **VP3-J** to energize **CPR/E1** (Crankcase Pressure High) (NE-116757-21 & NF-156981-5). _____
- 7.10.39 Remove jumper from terminals 10 and 11 on terminal strip **VP3-J** to de-energize **CPR/E1**. _____
- 7.10.40 Verify **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.41 Remove equipment from Engine 1 pressure switches. _____
I&C
- 7.10.42 **INDEPENDENTLY VERIFY** the following Engine 1 pressure switches are returned to service. The pressure switches isolation valves **SHALL** be OPEN and the test tee cap installed.
- A. 6174 Lube Oil Pressure 1 Low _____
I&C
- B. 6175 Lube Oil Pressure 2 Low _____
I&C
- C. 6176 Lube Oil Pressure 3 Low _____
I&C
- D. 6254 L.T. Cooling Water Pressure Low _____
I&C
- E. 6202 H.T. Cooling Water Pressure Low _____
I&C

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- 7.10.43** I&C simultaneously simulate adequate pressure to remove trip signals from the following Engine 2 devices:

_____ I&C

Device #	Name	Setpoint
6674	Lube Oil Pressure 1 Low/E2	43.5
6675	Lube Oil Pressure 2 Low/E2	43.5
6676	Lube Oil Pressure 3 Low/E2	43.5
6754	L.T. Cooling Water Pressure Low/E2	30.8
6702	H.T. Cooling Water Pressure Low/E2	30.8

- 7.10.44** Place **CS-60210**, D6 ENG1/ENG2 START SEL SW, in "ENGINE 2" to separate engine 2 from engine 1 pressure trips.

- 7.10.45** Reset **86 D6 GEN LOCKOUT**.

NOTE:

The following steps test the Lube Oil Pressure Low Low 2/3 logic.

- 7.10.46** Reduce pressure below setpoint to simulate Lube Oil Pressure 1 Low/E2 (**6674**) which energizes **LOP1/E2**.

_____ I&C

- 7.10.47** Reduce pressure below setpoint to simulate Lube Oil Pressure 2 Low/E2 (**6675**) which energizes **LOP2/E2**.

_____ I&C

- 7.10.48** Verify with Control Room that ERCS point **2Y8039D** indicates Lube Oil Pressure Low Low is in alarm.

- 7.10.49** Verify local Annunciator **60003-0106** is LIT.

- 7.10.50** Apply pressure above setpoint to Lube Oil Pressure 2 Low/E2 (**6675**) to de-energize **LOP2/E2**.

_____ I&C

- 7.10.51** Verify with Control Room that ERCS point **2Y8039D** clears.

- 7.10.52** Verify local Annunciator **60003-0106** is NOT LIT.

SP	D6 DIESEL GENERATOR RELAY FUNCTIONAL TEST	NUMBER:
		SP 2306
		REV: 11
		Page 21 of 24

7.10.53	Verify 86 D6 GEN LOCKOUT is TRIPPED.	_____
7.10.54	Reset 86 D6 GEN LOCKOUT .	_____
7.10.55	Reduce pressure below setpoint to simulate Lube Oil Pressure 3 Low/E2 (6676) which energizes LOP3/E2 .	_____
		I&C
7.10.56	Apply pressure above setpoint to Lube Oil Pressure 1 Low/E2 (6674) to de-energize LOP1/E2 .	_____
		I&C
7.10.57	Verify 86 D6 GEN LOCKOUT is TRIPPED.	_____
7.10.58	Reset 86 D6 GEN LOCKOUT .	_____
7.10.59	Reduce pressure below setpoint to simulate Lube Oil Pressure 2 Low/E2 (6675) which energizes LOP2/E2 .	_____
		I&C
7.10.60	Apply pressure above setpoint to Lube Oil Pressure 2 Low/E2 (6675) to de-energize LOP2/E2 .	_____
		I&C
7.10.61	Apply pressure above setpoint to Lube Oil Pressure 3 Low/E2 (6676) to de-energize LOP3/E2 .	_____
		I&C
7.10.62	Verify 86 D6 GEN LOCKOUT is TRIPPED.	_____
7.10.63	Reset 86 D6 GEN LOCKOUT .	_____
7.10.64	Reduce pressure below setpoint to simulate H.T. Cooling Water Pressure Low/E2 (6702) which energizes HTWR/E2 .	_____
		I&C
7.10.65	Apply pressure above setpoint to H.T. Cooling Water Pressure Low/E2 (6702) to de-energize HTWR/E2 .	_____
		I&C
7.10.66	Verify 86 D6 GEN LOCKOUT is TRIPPED.	_____
7.10.67	Reset 86 D6 GEN LOCKOUT .	_____

SP	D6 DIESEL GENERATOR RELAY FUNCTIONAL TEST	NUMBER:
		SP 2306
		REV: 11
		Page 22 of 24

- 7.10.68 Reduce pressure below setpoint to simulate L.T. Cooling Water Pressure Low (**6754**) which energize **LTWR/E2**.

I&C

- 7.10.69 Apply pressure above setpoint to L.T. Cooling Water Pressure Low (**6754**) to de-energize **LTWR/E2**.

I&C

- 7.10.70 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

- 7.10.71 Reset **86 D6 GEN LOCKOUT**.

- 7.10.72 In Panel 3, momentarily place jumper between terminals 10 (wire D6-ELO21) and 11 (wire D6-ELO23) on terminal strip **VP3-K** to energize **CPR/E2** (Crankcase pressure High) (NE-116757-22 & NF-156981-5).

- 7.10.73 Remove jumper from terminals 10 and 11 on terminal strip **VP3-K** to de-energize **CPR/E2**.

- 7.10.74 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

- 7.10.75 Reset **86 D6 GEN LOCKOUT**.

- 7.10.76 In Panel 4, remove jumper from between terminal D of **TEOS1** and terminal 1 of **VP2-J** to de-energize **TEOS1**.

- 7.10.77 Remove equipment from Engine 2 pressure switches.

I&C

- 7.10.78 **INDEPENDENTLY VERIFY** the following Engine 2 pressure switches are returned to service. The pressure switches isolation valves **SHALL** be OPEN and the test tee cap installed.

A. 6674 Lube Oil Pressure 1 Low

I&C

B. 6675 Lube Oil Pressure 2 Low

I&C

C. 6676 Lube Oil Pressure 3 Low

I&C

SP	D6 DIESEL GENERATOR RELAY FUNCTIONAL TEST	NUMBER:
		SP 2306
		REV: 11
		Page 23 of 24

D. 6654 L.T. Cooling Water Pressure Low

I&C

E. 6602 H.T. Cooling Water Pressure Low

I&C

7.10.79 Place **CS-60210**, D6 ENG1/ENG2 START SEL SW, in "ENGINE1/ENGINE2."

7.10.80 Reset **86 D6 GEN LOCKOUT** or NA if not required.

7.10.81 In Panel 3, momentarily place jumper between terminals 19 (wire D6-WCS2P) and 20 (wire D6-WCS26) on terminal strip **VP3-L** to energize **HTWTS/E2** (H.T. Cooling Water Temperature High-High) (NE-116757-24 & NF-156981-5).

7.10.82 Remove jumper from terminals 19 and 20 on terminal strip **VP3-L** to de-energize **HTWTS/E2**.

7.10.83 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

7.10.84 Reset **86 D6 GEN LOCKOUT**.

7.10.85 In Panel 3, momentarily place jumper between terminals 20 (wire D6-LOS2P) and 21 (wire D6-ELO29) on terminal strip **VP3-K** to energize **LOTR/E2** (Lube Oil High-High) (NE-116757-22 & NF-156981-5).

7.10.86 Remove jumper from terminals 20 and 21 on terminal strip **VP3-K** to de-energize **LOTR/E2**.

7.10.87 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

7.10.88 Reset **86 D6 GEN LOCKOUT**.

7.10.89 In Panel 4, momentarily place jumper between terminals 24 (wire D6-GP) and 25 (wire D6-GBT1) of terminal strip **VP3-A** to energize **GBT1R** (Engine 1 Generator Bearing Temp) (NE-116757-30 & NF-156981-4).

7.10.90 Remove jumper from terminals 24 and 25 of terminal strip **VP3-A** to de-energize **GBT1R**.

7.10.91 Verify **86 D6 GEN LOCKOUT** is TRIPPED.

SP	D6 DIESEL GENERATOR RELAY FUNCTIONAL TEST	NUMBER:
		SP 2306
		REV: 11
		Page 24 of 24

- 7.10.92 Reset **86 D6 GEN LOCKOUT**. _____
- 7.10.93 In Panel 4, momentarily place jumper between terminals 24 (wire D6-GP) and 26 (wire D6-GBT2) of terminal strip **VP3-A** to energize **GBT2R** (Engine 2 Generator Bearing Temp). _____
- 7.10.94 Remove jumper from terminals 24 and 26 of terminal strip **VP3-A** to de-energize **GBT2R**. _____
- 7.10.95 Verify **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.96 Reset **86 D6 GEN LOCKOUT**. _____
- 7.10.97 In Panel 5, momentarily place a jumper between terminals 3 and 7 of **RDDX-1**, D5 DSL GEN GOVERNOR PACK DIFFERENTIAL AUX RELAY. _____
- 7.10.98 Remove jumper from terminals 3 and 7 of **RDDX-1**. _____
- 7.10.99 Verify **86 D6 GEN LOCKOUT** is TRIPPED. _____
- 7.10.100 Reset **86 D6 GEN LOCKOUT**. _____
- 7.11 Reterminate lead lifted in Step 7.4.4, on contact terminal 10 (wire SFR-10) on Relay **SFR**. _____
- 7.12 Perform FME checks in all cabinets entered during performance of this SP per 5AWI 8.7.0. _____
- 7.13 Return D6 to operable status. _____

8.0 ADDITIONAL REQUIREMENTS

NONE

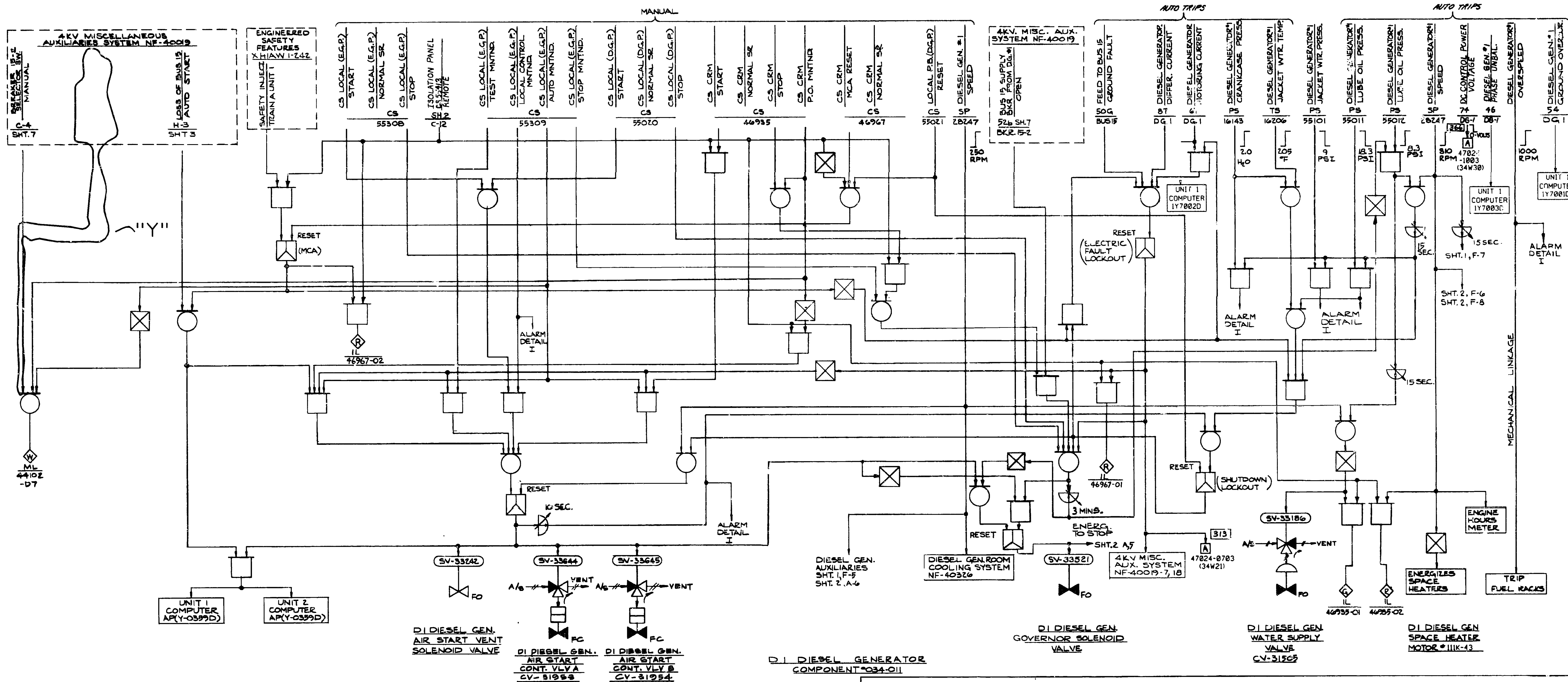
9.0 ATTACHMENTS

NONE

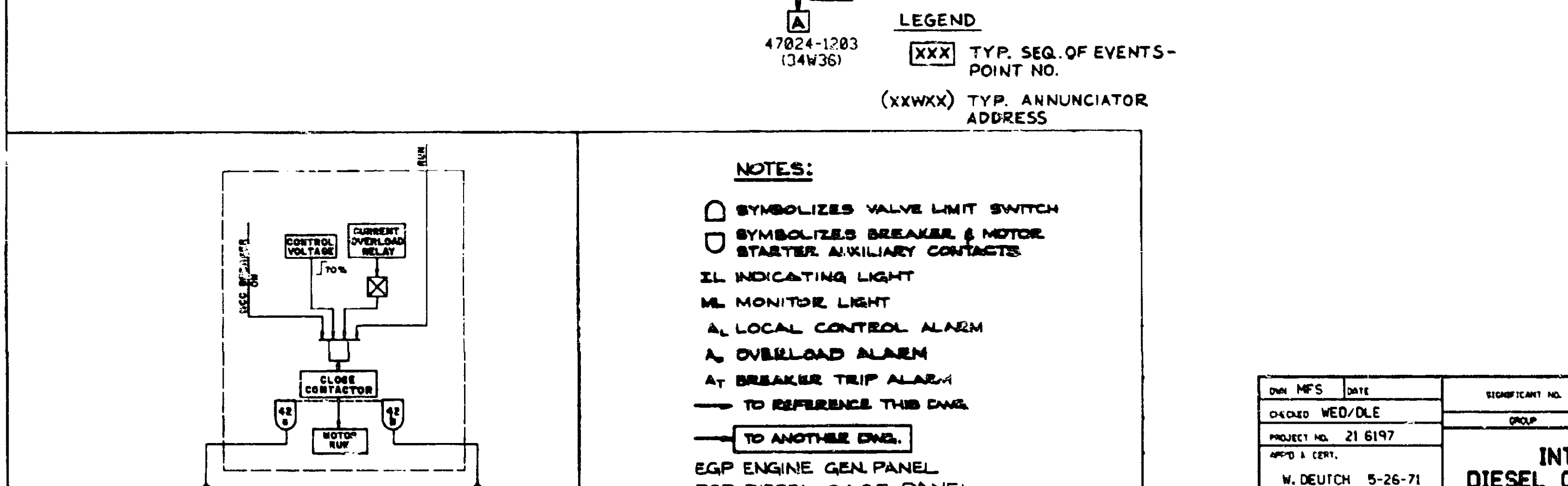
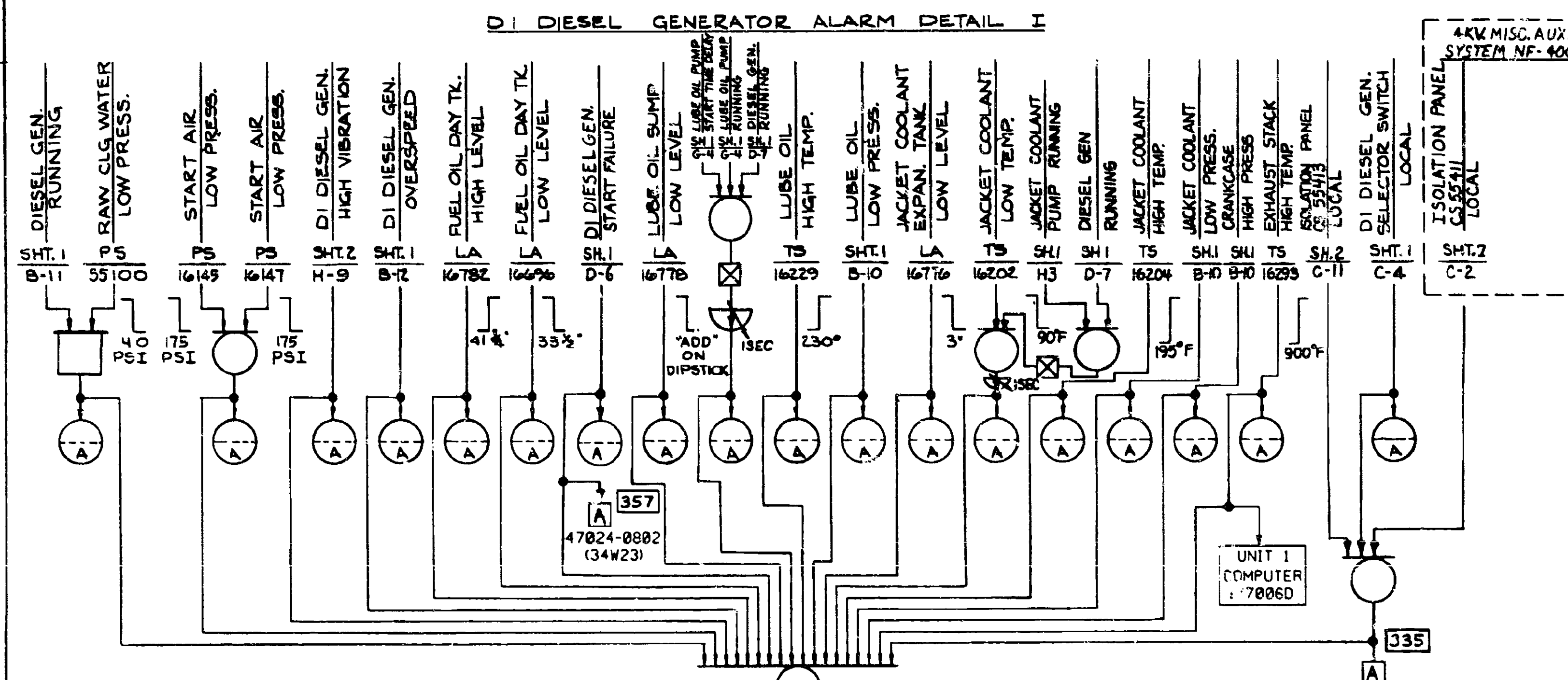
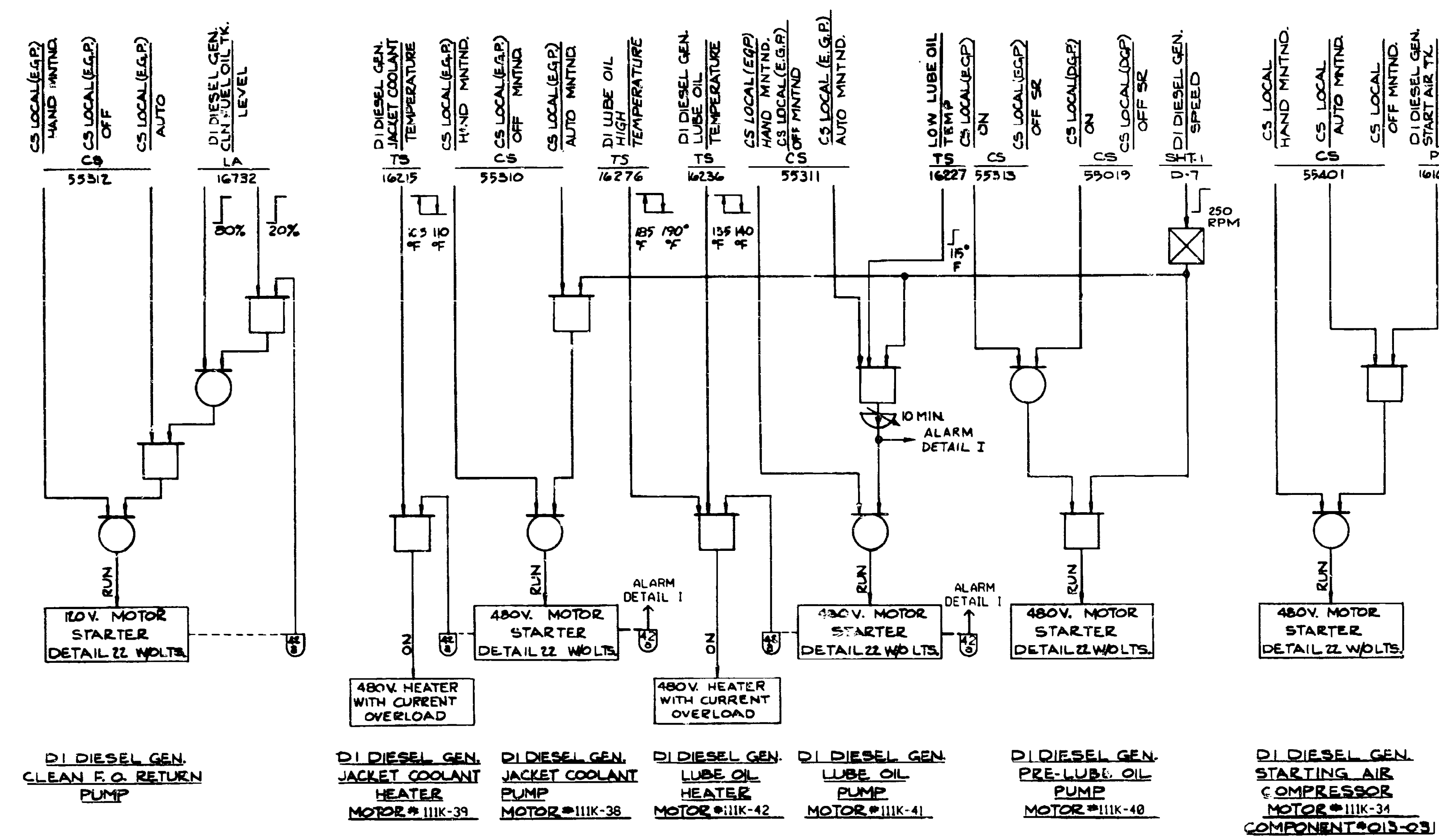
Attachment 3

NF-40325-1, Interlock Logic Diagram Diesel Generator System Unit 1 & 2

D1 DIESEL GENERATOR CONTROL LOGIC



D1 DIESEL GENERATOR AUXILIARIES



REVISIONS																																									
U	ADDED ANN. ADD-RE. # SEQ. OF EVENTS- POINT NO. FOR CONSTRUCTION DWN: GWJ CHK'D: KCD PROJ: 889982 APP'D: CERT'D: WJJ PE: 20013 5-29-91																																								
	INCORP'D ECR #2 FOR CONSTRUCTION DWN: R. RIES CHK'D: KCD PROJ: 889982 APP'D: CERT'D: WJJ PE: 20013 5-17-91																																								
	AS BUILT- INCORPORATED A/E'S REV. "U" PER REV. # 9-1-93 CERTIFIED REV. "U" TRANSFERRED TO RECORD TRACING. DWN: JWM 10-17-93 CHK'D: GDS 10-25-93 MOD: 89982 FILMED: 11/1/93																																								
V	6.4496 ACT. #000385 DELETE BUS 26 INT. & REV PER ESU-3086. ISSUED FOR CONSTR. (FOR 1992 CONF.) DWN: RS 12-4-92 CHK'D: A 12-7-92 PROJ: 899976 REV'D: A 12-8-92 APP'D: & CERT. G. OLSEN 12-8-92 PE# 21014 FILMED: 12-10-92																																								
	834479 ACT. #000385 REMOVED HOLD. A. REVISED BKR NO. PER 1994 CONF. ISSUED FOR CONSTR. DWN: RS 1-7-93 CHK'D: ML 1-7-93 PROJ: 899976 REV'D: A 1-21-93 APP'D: & CERT. G. OLSEN 1-20-93 PE# 21014 FILMED: 2-3-93																																								
	REMOVED FEED TO BUS 26 GRD FAULT & CS CRH BS. RESET PER ECR 899976-523. ISSUED FOR CONSTR. DWN: NJL 9-28-93 CHK'D: JWG 9-28-93 PROJ: 899976 REV'D: M 9-18-94 APP'D: & CERT. J. GOLDSMITH 9-28-94 PE# 13582																																								
	AS BUILT- INCORPORATED A/E'S REV. Y PER DRR PI-94-165 CERTIFIED REV. Y TRANSFERRED TO RECORD TRACING DWN: BMS 9-18-94 CHK'D: WP 9-18-94 MOD: 899976 FILMED: 9-28-95																																								
W	AS BUILT- REVISE DWG. TO REFLECT AS FOUND CONDITION. PER DRR PI-92-183 DWN: BMS 8-7-95 CHK'D: JMS 8-7-95 MOD: 899976 FILMED: 7-28-95																																								
X	AS BUILT- REVISED DWG. PER MARK-UP BY ADDING ALARM DETAIL. PER DRR PI-95-171 DWN: HRH 8/8/95 CHK'D: QJP 9-11-95 MOD: 899976 FILMED: 9-28-95																																								
Y	REMOVE BUS 15 TO TRANSFER SWITCH DWN: RDM 2/5/96 CHK'D: J.L. 2/5/96 PROJ: 944475 REV'D: APP'D: & CERT. G.C. SUNDBERG 2/6/96 PE# 11840 INCORPORATED A/E'S REV. Y PER DRR PI-97-62 CERTIFIED REV. Y TRANSFERRED TO RECORD TRACING DWN: CJP 7/23/96 CHK'D: PAS 8/7/97 MOD: 944475 FILMED: 9/97																																								
<table><tr><td>DWG. NO.</td><td>DATE</td><td>REVISION NO.</td><td>8630</td><td>100</td><td>2140</td></tr><tr><td>CHANGED BY/DLE</td><td>21 6197</td><td></td><td></td><td></td><td></td></tr><tr><td>PROJECT NO.</td><td>21 6197</td><td></td><td></td><td></td><td></td></tr><tr><td>APP'D & CERT.</td><td>M. DEUTCH</td><td>5-26-71</td><td></td><td></td><td></td></tr><tr><td>FILMED</td><td></td><td></td><td></td><td></td><td></td></tr></table>												DWG. NO.	DATE	REVISION NO.	8630	100	2140	CHANGED BY/DLE	21 6197					PROJECT NO.	21 6197					APP'D & CERT.	M. DEUTCH	5-26-71				FILMED					
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<table><tr><td colspan="6">INTERLOCK LOGIC DIAGRAM</td></tr><tr><td colspan="6">DIESEL GENERATOR SYSTEM UNIT 1 & 2</td></tr><tr><td colspan="6">NORTHERN STATES POWER COMPANY</td></tr><tr><td colspan="6">PRAIRIE ISLAND NUCLEAR GENERATING PLANT</td></tr><tr><td colspan="6">NF-40325-1</td></tr></table>												INTERLOCK LOGIC DIAGRAM						DIESEL GENERATOR SYSTEM UNIT 1 & 2						NORTHERN STATES POWER COMPANY						PRAIRIE ISLAND NUCLEAR GENERATING PLANT						NF-40325-1					
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NF-40325-1																																									

Attachment 4

NF-118850, D5/D6 System Logics Shutdown Due to Faults

SHUTDOWN DUE TO FAULTS
(REF. TABLE 1)

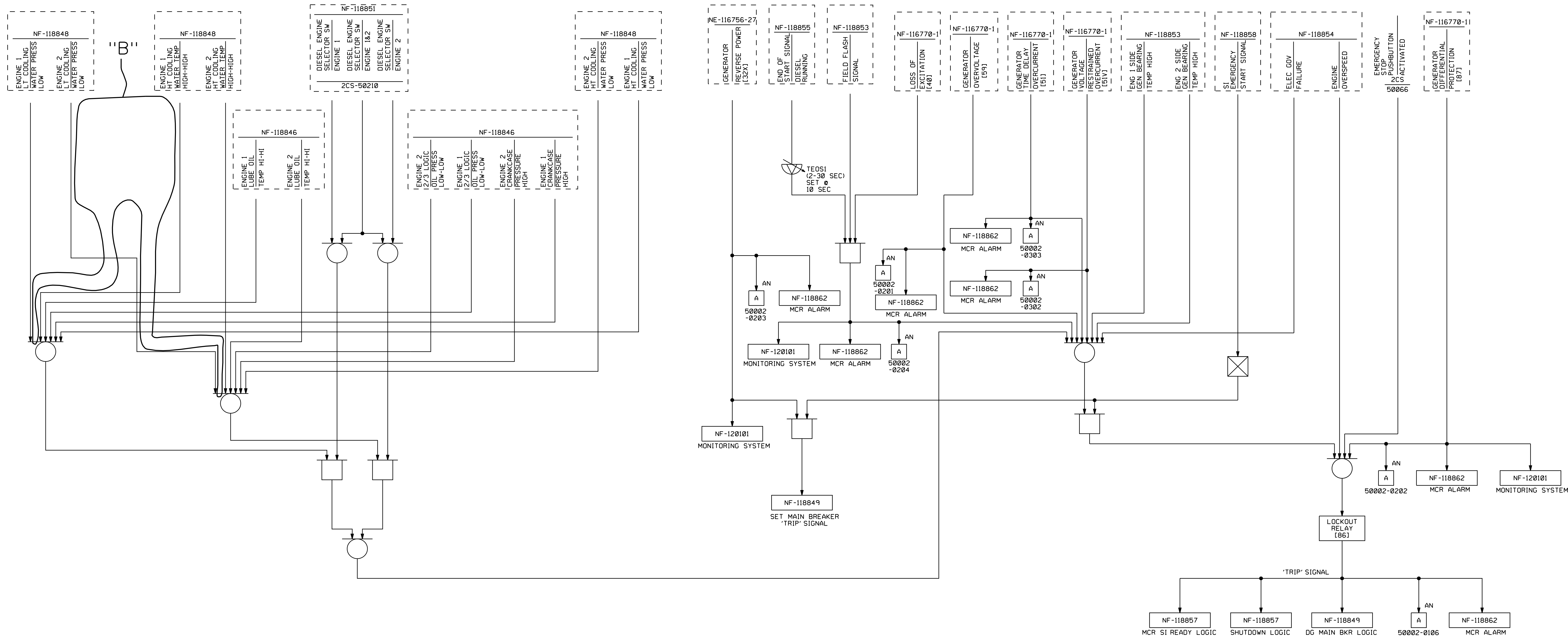


TABLE 1: SHUTDOWN DUE TO FAULTS						
GENERATOR SET	EMERGENCY STOP PUSHBUTTON	ALARM REFERENCES	ENGINE SENSOR INTERLOCK REFERENCE	GENERATOR PROT. DEVICE REFERENCE	RTU INPUT REFERENCE	DSL ENGINE SEL. SW
D5	2CS-50066	NF-118862	NF-118846	NF-116770-1	NF-120101	CS-50210
D6	2CS-60066	NF-118864	NF-118848	NF-116770-2	NF-118843	CS-60210

TABLE 2: SHUTDOWN DUE TO FAULTS ALARMS							
GENERATOR SET	GENERATOR OVER VOLTAGE	GEN. DIFF. PROTECTION	GEN. REVERSE POWER	LOSS OF EXCITATION	GEN. VOLTAGE RESTRAINED OVERCURRENT	GEN. OVERCURRENT	LOCKOUT RELAY
D5	50002-0201	50002-0202	50002-0203	50002-0204	50002-0302	50002-0303	50002-0106
D6	60002-0201	60002-0202	60002-0203	60002-0204	60002-0302	60002-0303	60002-0106

- NOTES:
- LOGIC IS SHOWN FOR D5 ONLY AND IS TYPICAL FOR D6.
 - ALL SYSTEMS AND THEIR COMPONENTS ARE NUCLEAR SAFETY RELATED (OAI) UNLESS SPECIFIED NON-SAFETY RELATED ON THE FLOW DIAGRAM.

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
G.A. OLSON
Date 12-2-92 Reg. No. 21014

FLUOR DANIEL PROJ. NO. 834473 ACT. NO. 000379	Designed By FLUOR DANIEL Chicago, Illinois 60606
OWN. R.S. DATE 11.30.92 CHECKED A.G. 12-1-92 REVIEWED A.G. 12-2-92 PROJ. NO. E89Y974	SIGNIFICANT NUMBER 8630 410 2 3600 1 3000 GROUP 2 PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT 1 & 2 - RED WING, MINNESOTA
APP'D. & CERT. G.A. OLSON PE-21014 12-2-92 FILMED	D5/D6 SYSTEM LOGICS SHUTDOWN DUE TO FAULTS NORTHERN STATES POWER COMPANY ENGINEERING DEPARTMENT MINNEAPOLIS
SCALE NONE	REV. B NF - 118850

REVISIONS

A4-0
INCORPORATED ECR 89Y974-597 AND NSP COMMENTS PER ESU-2930 & ESU-3064
ISSUED FOR CONSTRUCTION.
FILMED: 12-4-92

A AS BUILT-
INCORPORATE DRAWING INTO NSP DRAWING SYSTEM PER NDR PI-930
DWN: WHS 8-18-93
CHK'D: GPD 8-19-93
MOD: 89Y974
FILMED: 9-18-93

B REMOVED ENGINE 1 & 2 LUBE OIL SUMP LEVEL LOW TRIP CONTACT TO LOCAL ALARM. ISSUED FOR CONST

DWN: LAB 3-27-96
CHK'D: WF 3-27-96
MOD: 460501
REV'D
APP'D & CERT: G. SUNOBERG 3-27-96 PE* 11840
AS BUILT-
INCORPORATED A/E'S REV. B PER DRS PI-97-67
CERTIFIED REV. B TRANSFERRED TO RECORD TRACING
DWN: BMS 6-12-97
CHK'D: PAS 6-24-97
MOD: 460501
FILMED 7-97

Attachment 5

NF-118858, D5/D6 System Logics Emergency/Failure Start

REVISIONS
A4-0
INCORPORATED ECR 89Y974-597 AND NSP COMMENTS PER ESU-2930 & ESU-3064
ISSUED FOR CONSTRUCTION.
FILMED: 12-4-92
A AS BUILT-
INCORPORATE DRAWING INTO NSP DRAWING SYSTEM PER NDR PI-935
DWN: WHS 7-13-93
CHK'D: GPO 8-19-93
MOD: 89Y974
FILMED: 9-18-93

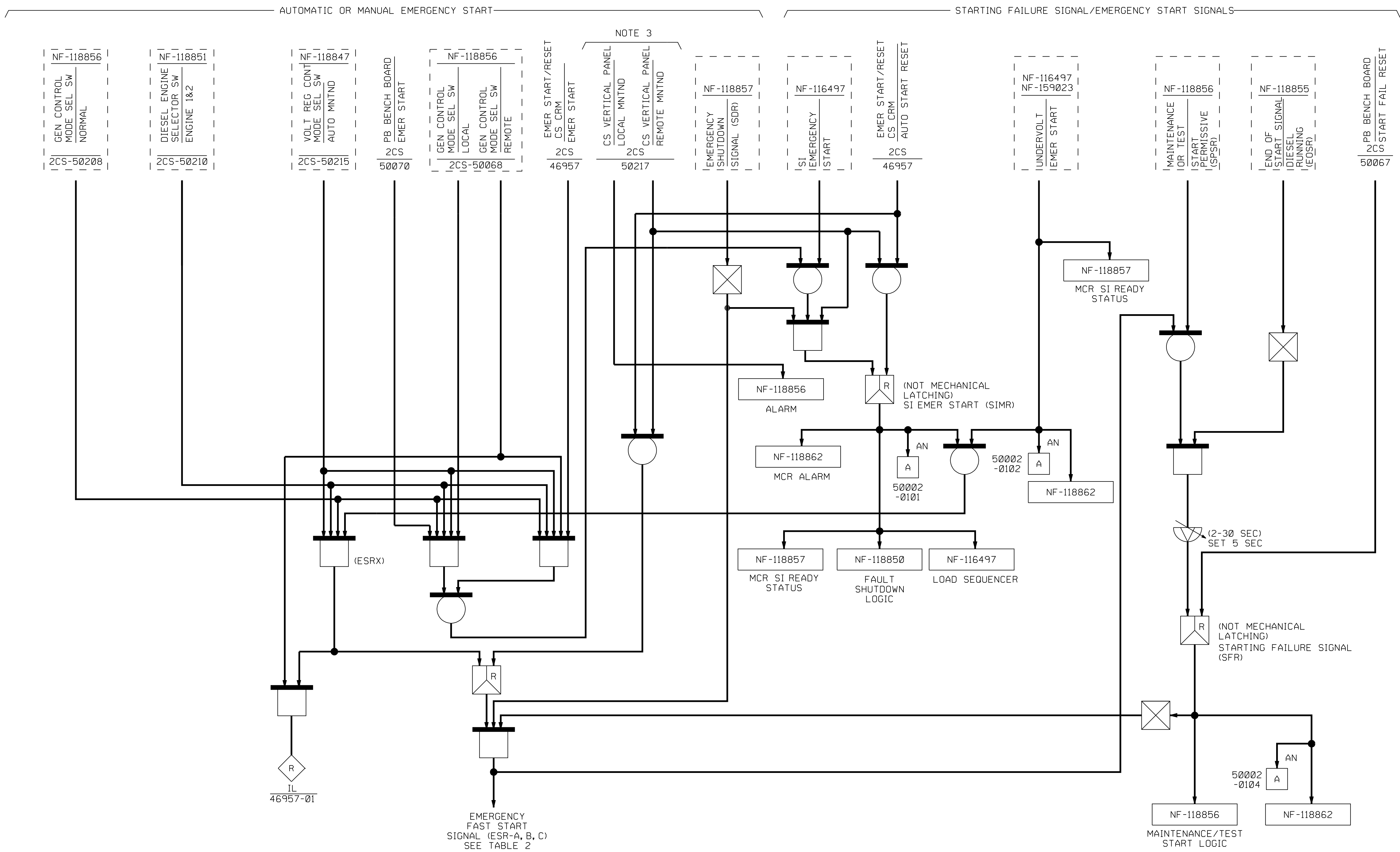


TABLE 1: STARTING FAILURE & EMERGENCY START/AUTOMATIC OR MANUAL EMERGENCY START														
GENERATOR SET	GENERATOR CONTROL MODE SEL SW	START/FAIL RESET PUSHBUTTON	VOLT REG CONT MODE SEL SW	DSL ENGINE SEL SW	GEN CONT MODE SEL SW	EMERGENCY PUSHBUTTONS			ALARMS			MCR ALARM REFERENCES	LOAD SEQUENCE REFERENCES	
						START	RESET	INDICATING LIGHT	SI EMERG. START	UNDER VOLT EMERG. START	STARTING FAILURE			
D5	2CS-50208	2CS-50067	2CS-50215	2CS-50210	2CS-50068	2CS-50070	2CS-46957	2CS-46957	46957-01	50002-0101	50002-0102	50002-0104	NF-118862	NF-116497
D6	2CS-60208	2CS-60067	2CS-60215	2CS-60210	2CS-60068	2CS-60070	2CS-46958	2CS-46958	46958-01	60002-0101	60002-0102	60002-0104	NF-118864	NF-159023

TABLE 2	
LOGIC DRAWING REFERENCES	TITLE/DESCRIPTION
NF-118845	FUEL OIL SYSTEM
NF-118846	PRELUBE SYSTEM
NF-118847	VOLTAGE REGULATOR
NF-118861	CLG FAN SYSTEM LOGIC
NF-118851	AIR START VALVES
NF-118854	SPEED GOVERNOR
NF-118855	SLOW START LOGIC
NF-118856	MAINTENANCE/TEST START LOGIC
NF-118857	SHUTDOWN SEQUENCE LOGIC
NF-120101	MONITORING SYSTEM COUNTERS

NOTES:

- LOGIC IS SHOWN FOR D5 ONLY AND IS TYPICAL FOR D6.
- ALL SYSTEMS AND THEIR COMPONENTS ARE **NUCLEAR SAFETY RELATED** (NSR) UNLESS SPECIFIED NON-SAFETY RELATED ON THE FLOW DIAGRAM.
- APPENDIX-R ISOLATION SWITCH IS APPLICABLE ONLY TO D5.

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.
G.A. OLSON
Date 12-2-92 Reg. No. 23014

FLUOR DANIEL PROJ. NO. 834473 ACT. NO. 000379		Designed By FLUOR DANIEL Chicago, Illinois 60606	
DWN: R.S. DATE 11.30.92		SIGNIFICANT NUMBER 8630	
CHECKED A.G. 12-1-92		GROUP 1 2 3 4 5 6	
REVIEWED A.G. 12-2-92		PRAIRIE ISLAND NUCLEAR GENERATING PLANT UNIT 1 & 2 - RED WING, MINNESOTA	
PROJ. NO. E89Y974		D5/D6 SYSTEM LOGICS EMERGENCY/FAILURE START	
APP'D & CERT. G.A. OLSON PE#21014 12-2-92		SCALE NONE REV. A	
FILMED		NORTHERN STATES POWER COMPANY ENGINEERING DEPARTMENT MINNEAPOLIS	
		NF - 118858	

NF - 118858