

Wayne H. Jens
Vice President
Nuclear Operations

**Detroit
Edison**

2000 Second Avenue
Detroit, Michigan 48226
(313) 586-4150

June 22, 1984
EF2-68267

Director of Nuclear Reactor Regulation
Attention: Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C, 20555

Dear Mr. Youngblood:

- References: (1) Fermi 2
NRC Docket No. 50-341
- (2) Letter from Detroit Edison to NRC,
"Standby Liquid Control System",
EF2-64548, August 17, 1983
- (3) Letter from NRC to Detroit Edison,
"Summary of Meeting Regarding the Standby
Liquid Control System on July 7, 1983",
July 19, 1983

Subject: Standby Liquid Control System

The following information is presented to indicate how Detroit Edison has addressed the commitments identified in Reference 2.

1. Commitment

Perform a QA/QC audit on all terminations of the SLCS instrumentation, control and power cables associated with the injection of the boron solution.

Action Taken

A QA/QC audit of the 110 SLCS cables has been performed. Seven nonconformances of a minor nature were identified and nonconformance reports were written to track their disposition. Of the seven nonconformances, five were due to cables missing identification tags at the time of the inspection, and two were improperly terminated shield cables. With the resolution of these minor non-conformances, the cables are considered to be installed and terminated to good quality construction standards.

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2. Commitment

Provide the results of the high voltage tests of the cables cited above to the NRR Staff.

Action Taken

All one hundred and ten (110) cables associated with the SLCS have been tested per Edison's generic Checkout and Initial Operation test program procedures which are applicable to both the safety-related and nonsafety-related systems. All cables were tested satisfactorily. Copies of the test results of the SLCS pump power cables are provided in Attachment 1. The remaining (i.e., control) cable test results are available in the Startup Resource Center- System Files, if you choose to audit/review them.

3. Commitment

Perform a design drawing review of the cables feeding off MCC 72B-4C and MCC 72E-5B to determine whether any of these cables could be affected by a common fault.

Action Taken

A review of the cables routed from MCC 72B-4C and MCC 72E-5B has been completed to determine whether any of these cables could be affected by a common fault. The review was performed by computer using the cable routing data files to identify all power or control cable trays which contain cables that terminate at either MCC 72B-4C or MCC 72E-5B.

As a consequence of the review, five interactions were identified where cables from the two MCCs in question shared the same cable trays - two with control cabling and three with power cabling. All interactions are considered acceptable by Detroit Edison. Additional detail on the interactions is provided below.

Description of Interactions:

- o Control Cabling - The two control cable interactions all contained cable associated with the control of the two SLCS pumps. The two areas of

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interaction arise from: 1) the common cable runs coming from the single SLCS pump selector switch in the Control Room; and 2) those going directly to the local common test panel in the area of the pumps themselves. During a brief part of one of the common runs there is also a control cable for the site evacuation alarm which operates from MCC 72B-4C. All of these cables are low voltage and are protected by fusing.

- o Power Cabling - The three interaction areas for power cabling are as follows:
 - 1) One area, as described in the July 7th meeting, consists of the cable tray run immediately feeding the SLCS pumps themselves. This run contains the power feeds to both pumps.
 - 2) The second area consists of a cable tray run which contains the power feeder cables to MCC 72B-4C and a cable from MCC 72E-5B to the RPS MG Set B.
 - 3) The third area, similar to 2, consists of a cable tray run which contains the power feeder cables to MCC 72E-5B and cables from the other MCC (MCC 72B-4C) which feed security feed #2 to the guardhouse and the evacuation alarm siren.

All feeds from the MCCs are protected by fusing. The power feeds to the motor control centers are protected by qualified 1E circuit breakers at their sources.

Justification:

The relatively limited exposure between the cables from the two MCCs plus the electrical isolation provided (fusing, breakers) in all cases makes the probability of both MCCs being affected by a fault in one of the loads or power feeds to one MCC extremely remote. This is especially true when one limits consideration to the power cables only; since faults in control cabling are generally recognized not to cause cable to cable failures due to their inherent low power. In the one

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instance of the power cabling in the vicinity of the pumps, other routing is impractical, especially considering the close proximity of the pumps themselves. In the other two instances, one failure mode is protected by a Class 1E breaker at the source (power feed to the MCC) and the other is protected by fuses at the MCC.

In addition, the MCCs, cables and other pertinent electrical components were purchased to the same specifications (except for documentation requirements) as Class 1E equipment. As stated in the FSAR, the MCCs, the SLCS pumps, and the applicable cable tray supports have also been seismically qualified.

Considering the above and considering the draft ATWS rule recognizes a lack of redundancy for ATWS events (e.g., dual pump operation is permitted), Detroit Edison considers the SLCS cable interactions acceptable and the system design sufficiently reliable for its intended purpose.

4. Commitment

Review the SLCS design and construction documentation plus walkdown the SLCS in the plant to verify that the system is designed and constructed to high quality standards.

Action Taken

Design and construction documents reviewed consisted of the following: piping and instrumentation drawings verified via walkdown; piping weld documentation (i.e., Form N-5 data reports) verified complete; piping hanger installation documentation (reviewed as part of the system turnover process) reviewed to verify it reflects as-built condition; and, SLCS cable pull cards reviewed in support of Commitment 3 resolution above.

In addition, a walkdown was performed of the SLCS to ensure that the as-built system conforms to the approved design and construction drawings, and that it was constructed to high quality standards. The walkdown consisted of direct observation of the mechanical and electrical components and equipment. A cable routing and cable tray walkdown was not included. The

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equipment was reviewed for quality and condition of equipment, installation and workmanship, verification of configuration to approved drawings, and comparison to comparable IE equipment installations. During the walkdown, the system was found to be constructed to high quality standards and in accordance with approved construction drawings. Minor items identified are being corrected.

5. Commitment

Subsequent to the satisfactory completion of the start-up testing of the SLCS (currently in progress), Detroit Edison commits to apply the same QA controls and procedures to SLCS components necessary for the injection of boron as would be applied to safety-related components at Fermi 2. This includes MCC 72B-4C and MCC 72E-5B. It is understood, however, that the SLCS electrical components were not originally intended, procured, designed or classified as safety-related as the term implies today.

Action Taken

The MCC 72B-4C, MCC 72E-5B and all electrical and mechanical components associated with the SLCS have been added to the EF2- Project Q list, and are classified as LM to indicate equipment not originally intended, procured, designed or classified as safety-related but which will be treated as safety-related henceforth.

6. Commitment

Propose an amendment to the draft Fermi 2 Technical Specifications for surveillance of electrical isolation devices associated with the SLCS.

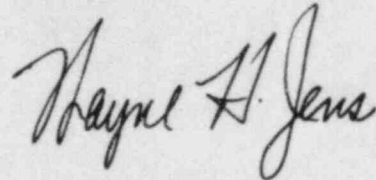
Action Taken

A proposed revision to the Fermi 2 Technical Specifications has been submitted which specifies the limiting conditions for operation and surveillance requirements for the circuit breakers and their associated protective devices that protect 14 buses. A copy of the proposed addition is included as Attachment 2.

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If you have any further questions, please contact
Mr. O. Keener Earle (313) 586-4207.

Sincerely,

A handwritten signature in cursive script, reading "Wayne A. Jens". The signature is written in dark ink and is positioned to the right of the typed name "Wayne A. Jens".

cc: Mr. P. Byron
Mr. M. D. Lynch
USNRC, Document Control Desk
Washington, D.C. 20555

Attachment 1: Checkout and Initial Operations
Test Forms for Power Cabling

STARTUP FORM 7.8

CHECKOUT AND INITIAL OPERATIONS TEST PROCEDURE

ENRICO FERMI ATOMIC POWER PLANT - UNIT 2

System PIS Number: C41-03-C001A
~~C41-00~~ ₂₃₄₂₃ Date: 10/8/80

Startup System Number: C41-00 System Request Number: 916 E

System Title: Standby Liquid Control (Control Pump C41-03-C001A)

K. Lathrop
K. Lathrop/J. Honkala J. Honkala E. Stockman E. J. J. 10-14-80
Startup Test Engineer/ Discipline Test Engineer
Lead Startup Test Engineer

The following equipment to be tested according to the approved checkout and initial operations test procedure indicated by date needed.

Item No.	Equipment Description/Number	Test Procedure /Revision	Date Needed	Date Tested	Comments
1	480V MCC 72B-4C-2A-R	CA10.000.026 Rev. 3	5-29-81	11-28-81	
2	HFA Relay K2A	CA10.000.045 Rev. 2	5-29-81	5-4-81	
3	Power Cable 214680-2	CA10.000.016 Rev. 4	5-29-81	5-18-81	
4	480V Motor C41-03-C001A	CA10.000.031 Rev. 3	5-29-81	10-1-81	
5	Scheme - Standby Liquid Control Pump C41-03-C001A	CA10.000.059 Rev.			TESTED AS PART OF ITEM # 1
6	⁹⁻²¹⁻⁸¹ BIW Cable 225452-0C	CA10.000.017 Rev. 2	5-29-81	5-18-81	
7	⁹⁻²¹⁻⁸¹ BIW Cable 225456-0C	CA10.000.017 Rev. 2	5-29-81	5-18-81	

Released for Test: JTB Collier 4-23-81
Test Discipline-Lead Startup Test Engineer Date

Test Results Reviewed By: Kenneth Pabis STE-NSSS-ELECT. 11-30-81
Name and Title Date

Approved By: Paul Lister 12/3/81
Test Discipline-Lead Startup Test Engineer/Plant I&C Engineer Date
_{Ph 12/3/81}

Remarks: Reference 61721-2131-1 * REVISIONS INDICATED PER

QA SF# FC/M 0438-B John Wiegand 2/19/82

Testing Reviewed/Approved By: D.W. Stockman 10-2-81 Paul Lister 12/3/81
Startup Engineer/Lead Startup Test Engineer Date

OVER

ENRICO FERMI 2
C&IO Test Form
TF.000.016.01
Revision 4
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5-17-81

Low and Medium Voltage Cable and Cable Buses

Test Procedure No. CAIO-000-016 Revision 3 SU System No. C4100
Test Leader FRANK G. BURK 7.8 No. 916E-3 Date 5-14-81
Cable No. 214680-0P PIS No. C4103C001A
Color Code BLACK Division BOP QA Level II

Location from: 72B-4C PO 2AR to: Motor RB 4th Flr of F10

Reference Drawings

612131-1 Rev C

TEST EQUIPMENT

Type	Instrument Number	Recalibration Date	Accuracy
1 Meggar	33103	8-19-81	0.3"
2			
3			
4			

Inspection and Test

Reference Procedure		Verified by/Date
3.1	The tagging requirements of the Startup Manual have been complied with.	<u>FB 5-15-81</u>
3.2	LSTE - Electrical released for test.	<u>FB 5-15-81</u>
3.3	Check that proper cable has been used and that the correct color code has been followed.	<u>FB 5-15-81</u>
3.4	Recalibration due date of equipment has not expired.	<u>FB 5-15-81</u>
3.5	Verify that there is no source of backfeed.	<u>FB 5-15-81</u>

Inspection and Test

Reference Procedure

Verified by/Date

- | | | |
|-----|---|----------------------|
| 6.1 | Cable is disconnected from load. | <u>RYS 5-15-81</u> |
| 7.1 | Check the termination and identification of cables. | <u>RYS 5-16-81</u> |
| 7.2 | Check that termination hardware is installed and that cable shield is grounded. | <u>KYP 11-28-81</u> |
| 7.3 | Check for phasing and continuity. | <u>RYS 5-16-81</u> |
| 7.4 | Check for proper electrical clearances. | <u>KYP 11-28-81</u> |
| 7.5 | Check housing ground connections (cable bus only). | <u>WAS/S 4-21-81</u> |

7.6/7.7 Insulation Checks

Wire Designation	Phased correctly	Megger* 1000V	@ 2500V	Hi-pot**	
				35 KVDC	50 KVDC
Black	ok	1000+	NA	KYP 11-28-81	
White	ok	1000+	NA	KYP 11-28-81	
Red	ok	1000+	NA	KYP 11-28-81	

*100 megohms minimum, at a test duration of ≥ 10 seconds.

**Test duration of the 35KV dc and 50KV dc test potential is 5 minutes.

Leakage current to be: < 0.35 mA @ 35KVDC
 < 0.5 mA @ 50KVDC

RYS 5-16-81

JAN 27 1981

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C&IO Test Form
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Inspection and Tests

Procedure
Reference

Verified by/Date

7.8 Cables were drained for at least 30 minutes.

ZAB 5-16-81

8.1 All inspections and test performed satisfactorily.

KJP 11-28-81

8.2 All deviations have been resolved.

KJP 11-28-81

10.1 Cables may be terminated to equipment.

ZAB 5-16-81

Comments and Conclusions: _____

Test Leader:

Frank J. Burke

Date:

5-18-81

Reviewed By:

Kenneth J. Palmer
Test Engineer

Date:

11-28-81

STARTUP FORM 7.8

CHECKOUT AND INITIAL OPERATIONS TEST PROCEDURE

ENRICO FERMI ATOMIC POWER PLANT - UNIT 2

System PIS Number: C41-03-C001B Date: 10/8/80

Startup System Number: C41-00 System Request Number: 1569 E

System Title: Standby Liquid Control (Control Pump C41-03-C001B)

K. Lathrop
K. Lathrop/J. Honkala J. Honkala E. Stockman E. Stockman
Startup Test Engineer/ Discipline Test Engineer
Lead Startup Test Engineer

The following equipment to be tested according to the approved checkout and initial operations test procedure indicated by date needed.

Item No.	Equipment Description/Number	Test Procedure /Revision *	Date Needed	Date Tested	Comments
1	480V MCC 72E-5B-2B	CA10.000.026 Rev.3	5-29-81	11-28-81	
2	HFA Relay K2B	CA10.000.045 Rev.2	5-29-81	5-4-81	
3	Power Cable 214690-0P	CA10.000.016 Rev.4	5-29-81	5-18-81	
4	480V Motor C41-03-C001B	CA10.000.031 Rev.3	5-29-81	10-1-81	
5	Scheme - Standby Liquid Control Pump C41-03-C001B	CA10.000.059 Rev.			TESTED AS PART OF ITEM #1

Released for Test: W. C. Cole 4-23-81
Test Discipline-Lead Startup Test Engineer Date

Test Results Reviewed By: Kenneth Fabian STE-NSSS-ELECT. 11-30-81
Name and Title Date

Approved By: Paul Fessler 12/13/81
Test Discipline-Lead Startup Test Engineer/Plant I&C Engineer Date

Remarks: Reference-61721-2131-1 * REVISIONS INDICATED PER

SF # FC/M 0438-B John W. Sigaud 2/19/82

Testing Reviewed/Approved By: DW Stockman 12-2-81 P. Fessler 12/5/81
Startup Engineer/Lead Startup Test Engineer Date

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Low and Medium Voltage Cable and Cable Buses

Test Procedure No. CAIO-000-016 Revision 3 SU System No. C4100

Test Leader FRANK C. Burke 7.8 No. 1569E-3 Date 5-14-81

Cable No. 214690-0P PIS No. C4103C001B

Color Code BLACK Division BOP QA Level II

Location from: 77E-5B pos 7B to: Motor RB 41"FLR wLFK

Reference Drawings

6213-1 Rev C

TEST EQUIPMENT

Type	Instrument Number	Recalibration Date	Accuracy
1 Meggar	33103	8-19-81	0.03"
2			
3			
4			

Inspection and Test

Reference Procedure		Verified by/Date
3.1	The tagging requirements of the Startup Manual have been complied with.	<u>ZRB 5-14-81</u>
3.2	LSTE - Electrical released for test.	<u>ZRB 5-14-81</u>
3.3	Check that proper cable has been used and that the correct color code has been followed.	<u>ZRB 5-15-81</u>
3.4	Recalibration due date of equipment has not expired.	<u>ZRB 5-14-81</u>
3.5	Verify that there is no source of backfeed.	<u>ZRB 5-14-81</u>

TED Approved
 JAN 27 1981

Inspection and Test

<u>Reference Procedure</u>		<u>Verified by/Date</u>
6.1	Cable is disconnected from load.	<u>ZAB 5-15-81</u>
7.1	Check the termination and identification of cables.	<u>ZAB 5-15-81</u>
7.2	Check that termination hardware is installed and that cable shield is grounded.	<u>ZAB 5-16-81</u>
7.3	Check for phasing and continuity.	<u>ZAB 5-16-81</u>
7.4	Check for proper electrical clearances.	<u>ZAB 5-16-81</u>
7.5	Check housing ground connections (cable bus only).	<u>WAS 4-21-81</u>

7.6/7.7 Insulation Checks

Wire Designation	Phased correctly	Megger* 1000V	@ 2500V	Hi-pot**	
				35 KVDC	50 KVDC
Black	✓	1000		NA	KJP 11-28-81
white	✓	1000		NA	KJP 11-28-81
Red	✓	1000		NA	KJP 11-28-81

*100 megohms minimum, at a test duration of \geq 10 seconds.

**Test duration of the 35KV dc and 50KV dc test potential is 5 minutes.

Leakage current to be: $<$ 0.35 mA @ 35KVDC

$<$ 0.5 mA @ 50KVDC

ZAB 5-16-81

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Inspection and Tests

Procedure
Reference

Verified by/Date

- 7.8 Cables were drained for at least 30 minutes.
- 8.1 All inspections and test performed satisfactorily.
- 8.2 All deviations have been resolved.
- 10.1 Cables may be terminated to equipment.

FAB 5-16-81

KYP 11-28-81

KYP 11-28-81

FAB 5-16-81

Comments and Conclusions: _____

Test Leader: Frank A. Burke Date: 5-18-81
Reviewed By: Kenneth J. Pabian Date: 11-28-81
Test Engineer

Attachment 2: Proposed Revision to
Fermi-2 Technical Specifications

ELECTRICAL POWER SYSTEMS

STANDBY LIQUID CONTROL SYSTEM ASSOCIATED ISOLATION DEVICES

LIMITING CONDITION FOR OPERATION

3.8.4.5 All circuit breakers shown in Table 3.8.4.5-1 shall be OPERABLE.

APPLICABILITY: When Standby Liquid Control System is required to be operable.

ACTION:

With one or more of the circuit breakers shown in Table 3.8.4.5-1 inoperable either:

- a. Restore the inoperable circuit breaker(s) to OPERABLE status within eight (8) hours, or
- b. Trip the inoperable circuit breaker(s), rack out or remove the device from service within eight (8) hours and verify the circuit breaker(s) to be racked out or removed from service at least once per seven (7) days thereafter, and declare the applicable Standby Liquid Control System (SLCS) component inoperable and apply the appropriate ACTION statement for the SLCS.

SURVEILLANCE REQUIREMENTS

4.8.4.5 Each of the above required circuit breaker(s) shall be demonstrated OPERABLE:

- a. At least once per 18 months by performing a CHANNEL CALIBRATION of the associated protective relays and a CHANNEL FUNCTIONAL TEST of each breaker which includes simulation of actuation of the system and verifying that each relay and associated circuit breaker and overcurrent control circuits functions as designed.
- b. At least once per 60 months by subjecting each circuit breaker to an inspection and preventive maintenance in accordance with procedures prepared in conjunction with its manufacturer's recommendations.

TABLE 3.8.4.5-1

Standby Liquid Control System Associated Isolation Devices
480 v Motor Control Centers

MCC 72B-4A

Position 2F

SLC Heat Trace A

MCC 72B-4C

Position 1A

Incoming Feed

Position 2AR

SLC Pump A

MCC 72C-4A

Position 5C

SLC Heater A

MCC 72E-4B

Position 1AR

SLC Heat Trace B

MCC 72E-5B

Position 1C

Incoming Line

Position 2B

SLC Pump B

Position 2CR

SLC Heater B