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SUBJECT: Forwards summary of util planned response to 890814 reactor trip,per 890815 telcon w/Region III,NRR & AEPSC.

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RIDS/ADDS

RIDS/ADDS

Indiana Michigan
Power Company
P.O. Box 16631
Columbus, OH 43216

INDIANA MICHIGAN POWER

AEP:NRC:1105

Donald C. Cook Nuclear Plant Unit 2
Docket No. 50-316
License No. DPR-74
EVALUATION OF AUGUST 14, 1989 UNIT 2 REACTOR TRIP

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Attn: A. B. Davis

August 16, 1989

Dear Mr. Davis:

A conference call was held on August 15, 1989 among NRC Region III, NRR, and AEPSC representatives to address the August 14, 1989 Unit 2 reactor trip. The attachment to this letter formally documents actions being taken or that are planned in response to the reactor trip. All of the indicated actions will be completed prior to the restart of Unit 2 with the exception of item 3.

This document has been prepared following Corporate procedures that incorporate a reasonable set of controls to ensure its accuracy and completeness prior to signature by the undersigned.

Sincerely,

M. P. Alexich
Vice President

MPA/eh

cc: D. H. Williams, Jr.
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
NFEM Section Chief
NRC Resident Inspector - Bridgman

IE01
1/1

The following information is provided to formally document actions being taken or that are planned as a result of the recent failure of a Unit 2 120 VAC control room instrumentation distribution (CRID) power supply and subsequent Unit 2 reactor trip.

1) Root Cause Evaluation

A root cause analysis of the CRID failure will be performed.

2) Surveillance of Equipment Affected by CRID IV Failure

Before returning to power operation, the necessary surveillances will be performed to provide assurance that equipment affected by the incident is reliable.

3) Wide Range Steam Generator Level Indication Compliance with Regulatory Guide 1.97

Our position regarding this and other accident monitoring channels was documented in submittal AEP:NRC:0773AB dated October 5, 1988. That submittal includes the regulatory basis for the Donald C. Cook Nuclear Plant steam generator wide range level instrumentation. We will, however, reconsider our position in conjunction with the NRC's SER associated with our submittal.

4) Rod Bottom Lights

The root cause of the rod bottom light failure will be evaluated to determine whether the failure is related to the CRID IV electrical failure.

5) CRID Common Mode Failure Potential

Once the root cause of the CRID IV failure has been established, an evaluation of the potential for that root cause to lead to common mode failure of the other CRID invertors will be conducted including consideration for bus transfer failures and necessary testing.

6) Feedwater Check Valve Failure

A root cause evaluation of the check valve failure will be performed including an examination of recent maintenance history.

7) NRC Briefing Prior to Startup

The NRC will be notified regarding the status of each of the above commitments prior to plant startup (except item 3).

Indiana Michigan
Power Company
P.O. Box [illegible]

ATTACHMENT #2
IR #89025/89025

INDIANA
MICHIGAN
POWER

AEP:NRC:1105

Donald C. Cook Nuclear Plant Unit 2
Docket No. 50-316
License No. DPR-74
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M. P. Alexich
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cc: D. H. Williams, Jr.
W. G. Smith, Jr. - Bridgman
R. C. Callen
G. Charnoff
NFEM Section Chief
NRC Resident Inspector - Bridgman

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ATTACHMENT NO. 3
IR No. 50-315/89025
50-316/89025

D. C. COOK UNIT 2 REACTOR TRIP
4:01 P.M. AUGUST 14, 1989

SEQUENCE OF EVENTS

Time	Event	Note
3:40 p.m.	Power Range N-44 fuse (5 amp) blows; CRID-IV transfers to alternate supply; 4 SSPS output relays "chatter" briefly	
3:45 p.m.	N-44 bistables placed in "trip" per TS	
3:45 p.m.	N-44 defused completely	
3:55 p.m.	CRID-IV checkout for transfer to normal power	
4:01:24 p.m.	CRID-IV pushbutton actuated to transfer power; Reactor trip -	
	FIRST OUT: Reactor Coolant Pump 4 breaker "Open" relay dropout-Reactor Trip	
	SUBSEQUENT: RTB "B" open	0 seconds
	RTB "A" open	
	Turbine Trip - left channel	
	Turbine Trip - right channel	
	Main feedwater Trip	
	RTB undervoltage; "A" and "B"	
	EHC system trip	
	Turbine stop valves closed	1 second
4:01:26	Control rods in - 3 "bottom" lights not illuminated; rod H-8 light came in a few seconds later, leaving two (B-4 and C-7) failed	2 seconds
4:01:26	Auxiliary feedwater pump autostarts	MFP trip
4:01:28-30	Steam generator low levels received-all channels	
4:01:30 (approx)	Operators commence E-0 "Reactor Trip or Safety Injection"	
4:01:36-38	Steam generator low-low levels	

4:01:52	Main generator output breaker opens normally	All times hereafter are approx
4:01:55	Operator manual turbine (solenoid) trip, followed by manual AMSAC trip	
4:02	Steam generator levels offscale low	
4:02	Operators verify no SI required, commence ES-0.1, "Reactor Trip Response"	
4:03	Onshift STA reviews "Status Trees" - no emergency indications	
4:03	Operator performs emergency boration (pumps already running) by opening boration valve	
4:05	Control room vent fan started to clear out smell of smoke	
4:10	Emergency boration secured	
4:15	Steam generator narrow-range levels back onscale	
4:15	Both source range NIs reenergize normally	
4:05-4:15	Operations in manual control: letdown/charging flow letdown pressure control CCW to letdown heat exchanger steam generator PORVs	
4:16	Turbine AFW pump secured; RCS cooldown stopped at 535 degrees fahrenheit	
4:20-4:30	Reactor and secondary plants stablilized in MODE 3	
4:30	Turbine turning gear motor secured - reported smoking	
4:30-4:35	RCS cooldown below 541 degrees fahrenheit to secure RCP No. 4	
4:36	RCP No. 4 stopped due to absence of pump monitoring instrumentation	
4:46	CRID-IV transferred to lighting panel power supply CRP-3, restoring normal voltage	
4:46-5:30	CRID-IV instrumentation and control loads individually restored with minor exceptions; appropriate controls placed in automatic to maintain plant in standby status pending startup or cooldown decision	

ATTACHMENT NO. 4

EQUIPMENT AFFECTED BY CRID NO. 4

The following is a list of affected safety and nonsafety-related instrumentation and control components that were loss as the result of the opening of various breakers and fuses:

Breaker No.	Instrument	Function
Rack 12	MPP-212	SG No. 1 Pressure Channel
(RPS)	MPP-242	SG No. 4 Pressure Channel
	BLP-110	SG Loop No. 1 Narrow Range Level Channel
	BLP-120	SG Loop No. 2 Narrow Range Level Channel
	BLP-130	SG Loop No. 3 Narrow Range Level Channel
	BLP-140	SG Loop No. 4 Narrow Range Level Channel
	NPS-153	PZR Pressure Transmitter
	PPP-300	Lower Containment Pressure Channel
	ELS-951	RWST Level Channel
	FFI-240	Auxiliary Feedwater Flow to SG No. 4 Channel

Breaker No.	Instrument	Function
Rack 13 (RPS)	NTP-141	Reactor Coolant Loop No. 4 RTD Thot
	NTP-140	Reactor Coolant Loop No. 4 RTD Thot
	NTP-241	Reactor Coolant Loop No. 4 RTD Tcold
	NTP-240	Reactor Coolant Loop No. 4 RTD Tcold
	FFI-241	Feed Water Flow to SG No. 4 Channel
Cab 22-CG4 (Control Rack)	ILA-131	Accumulator Tank No. 3 Level Channel
	ILA-141	Accumulator Tank No. 4 Level Channel
	IPA-131	Accumulator Tank No. 3 Pressure Channel
	IPA-141	Accumulator Tank No. 4 Pressure Channel
	QTI-240	RCP Loop No. 4 Low Bearing Temperature
	QTI-40	RCP Loop No. 4 Seal No. 1 Temperature
	NTA-252	PZR Vapor Temperature

Breaker No.	Instrument	Function
	IFI-54	Reactor Coolant Loop No. 4 Cold Injection Flow Channel
	QFA-240	Seal Water Injection Flow Channel
	QDA-40	RCP Loop No. 4 Seal Water Flow
Cab 23-CG4	ITR-311	Residue Heater No. 1 RTD
(Control Rack)	QTC-302	Letdown Heat Exchanger RTD
	NTA-152	PRZR Relief Discharge Temperature
	IPA-310	RHR Pump No. 1 Discharge Pressure Channel
	QPC-301	Letdown Heater Low Pressure Channel
	IPA-250	Boron Injection Tank Pressure Channel
	IFI-310	Residue Heater No. 2 Outlet Flow
	QLC-452	Volume Control Tank Level Channel
	IFI-311	Residue Heater No. 2 Outlet Flow
	QRV-303	Letdown to CVT Diversion Valve

Breaker No.	Instrument	Function
	FRV-240	Loop No. 4 Feedwater Control Valve
	CRV-470	Letdown Heat Exchanger CCW Valve
	QRV-301	Letdown Heater Control Valve
Cab 24-CG4	TY-412C	Delta Temperature/TAVG
(Control Rack)	TY-422C	Current to Current Converters
	TY-432C	" " " "
	TY-442C	" " " "
	TY-505D	" " " "
	TY-411D	" " " "
	TY-421D	" " " "
	TY-431D	" " " "
	TY-441D	" " " "
	NPT-411	SG Loop No. 1 Wide Range Level Channel
	NPT-421	SG Loop No. 2 Wide Range Level Channel
	NPT-431	SG Loop No. 3 Wide Range Level Channel
	NPT-441	SG Loop No. 4 Wide Range Level Channel

Breaker No.	Instrument	Function
Cab 25-CG4		Control Rod Bank A Position
(Control Rack)		Control Rod Bank B Position
		Control Rod Bank C Position
		Control Rod Bank D Position
		Rod Insertion Recorder
		Bank A Limit
		Bank A Position
		Bank B Limit
		Bank B Position
		Bank C Limit
		Bank C Position
		Bank D Limit
		Bank D Position
		Average Power
		Quadrant 1
		Quadrant 2
		Quadrant 3
		Quadrant 4
		Rod Control
		Automatic Rods In
		Automatic Rods Out
		Rod Speed Demand
Cab B		Incore Thermocouples
Demultiplexer (ckt. 14)	K-0704 K-0705 K-0706 K-0707	Turbine Stop Valve Status Light Relays

Instrument Fuses Replaced	Function
Train B No. 2 48V Power Supply	Solid State Protection System
Train B No. 2 15V Power Supply	Solid State Protection System
NR-44	Power Range NI Recorder
SG-14	Overpower Recorder
FRV-210	SG Water Level Control Valve Auto/Manual Station
NRV-164	PZR Water Spray Valve Auto/Manual Station
QRV-450	Boric Acid Transfer Pump Tank No. 2 Recirculation Manual Station
°	Feedwater Differential Pressure Controller
°	PZR Safety and Relief Valve Flow Monitor
SG-31	Incore Thermocouple Train B Recorder
GRV-341	Nitrogen Supply to Accumulator Vent Valve Controller
N-44	Power Range Control Power Fuses
°	Comparator - Rate Drawer Control Power Fuses
°	Audio Count Rate Drawer
	Audio Channel PWR
	Timer Scaler PWR

ATTACHMENT NO. 5

IR No.50-315/89025;

50-316/89025

PROCEDURES REVIEWED

02-OHP 4023.E-0, "Reactor Trip or Safety Injection."

02-OHP 4023.ES-0.1, "Reactor Trip Response."

**2-OHP 4021.082.008, "Operation of CRID Power Supplies."

2-OHP 4022.013.004, "Power Range Malfunction."

**2-OHP 4022.013.006, "Tripping of Protection Set Bistables."

2-OHP 4024.207, "Drops" 81-100, "Reactor Coolant Annunciator."

2-OHP 4024.208, "Drops" 9, 34, 37, "Pressurizer Annunciator."

2-OHP 4024.219, "Drops" 30, "Station Auxiliary AB Annunciator."

2-OHP 4024.206, "Drops" 18, 19, 23, 24, "Residual Heat Removal Annunciator."

2-OHP 4024.213, "Drops" 4, 34, "Steam Generator 1 and 2."

2-OHP 4024.214, "Drops" 4, 34, "Steam Generator 3 and 4."

2-OHP 4024.205, "Drops" 32, 34, "Containment Spray Annunciator."

OHI-5030 Attachment No. 2, Test No. 95, "Unit 2 Operations 5030 Surveillance."

**12 MHP 5021.001.071, "Inspection and Repair of Atwood and Morrill Swing Check Valves (except 2-CS-321)."

ACTIONS TO IMPROVE WATER CHEMISTRY TRENDING

In February 1989, a task force was assembled to evaluate alternatives to the CMCP for use in long term trending of Cook Nuclear Plant water chemistry parameters. The task force consists of personnel from the Cook Nuclear Plant Technical Physical Sciences Chemistry Section, AEPSC Chemical Engineering and Performance Section, and AEPSC Information Systems Department. The result of the task force's efforts will be to identify a computer based program for long term trending of water chemistry parameters that is more conducive to fulfilling both Cook Nuclear Plant and AEPSC needs for trend information. Final recommendations for changes to the long term trending program will be made by the task force on or before September 15, 1989.

In the interim period while the task force recommendations are being finalized and action to modify the long term water chemistry program is initiated, Cook Nuclear Plant will resume use of the CMCP for long term trending. Long term trending (e.g., one year) of secondary water chemistry parameters using the CMCP will be performed on a monthly basis by Cook Nuclear Plant Technical Physical Sciences Chemical Supervisors and on a quarterly basis by the AEPSC Chemical Engineering and Performance Section. The CMCP can produce trend graphs either on a terminal screen or by hard copy and is accessible at both Cook Nuclear Plant and Corporate offices. These measures are considered adequate to provide the necessary long term trend information on an interim basis.

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Sincerely,

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Vice President

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