(13)

CONTROLLED
CENTRAL FILE

2105-1.3
Revision 2
10/25/78

APR 2 3 1979

THREE MILE ISLAND NUCLEAR STATION
UNIT #2 OPERATING PROCEDURE 2105-1.3
SAFETY FEATURES ACTUATION SYSTEM

Table of Effective Pages

Page	Date	Revision	Page	Date	Revision	Page	Date	Revision
1.0	04/09/77	0	26.0			51.0		
2.0	04/09/77	0	27.0			52.0		
3.0	04/09/77	0	28.0			53.0		
4.0	04/09/77	0	29.0			54.0		
5.0	10/25/78	2	30.0			55.0		
6.0	04/09/77	0	31.0			56.0		
7.0	06/05/77	1	32.0			57.0		
8.0	04/09/77	0	33.0			58.0		
9.0	04/09/77	0	34.0			59.0		
10.0	04/09/77	0	35.0			60.0		
11.0	04/09/77	0	36.0			61.0		
12.0	04/09/77	0	37.0			62.0		
13.0			38.0			63.0		
14.0			39.0			64.0		
15.0			40.0			65.0		
16.0			41.0			66.0		
17.0			42.0			67.0		
18.0			43.0			68.0		
19.0			44.0			69.0		
20.0			45.0			70.0		
21.0			46.0			71.0		
22.0			47.0			72.0		
23.0			48.0			73.0		
24.0			49.0			74.0		
25.0			50.0			75.0		

Unit 1 Staff Recommends Approval
Approval N/A Date —
Cognizant Dept. Head

Unit 2 Staff Recommends Approval
Approval N/A Date —
Cognizant Dept. Head

Unit 1 PORC Recommends Approval
N/A Date —
Chairman of PORC

Unit 2 PORC Recommends Approval
R P Warren Date 10/25/78
Chairman of PORC

Unit 1 Superintendent Approval
N/A Date —

Unit 2 Superintendent Approval
G K Hooelenger Date 10/25/78

Manager Generation Quality Assurance Approval N/A Date —

TMI 55-a Rev 8/77

1394 085

APR 2 3 1979

THREE MILE ISLAND NUCLEAR STATION

UNIT #2 OPERATING PROCEDURE 2105-1.3

SAFETY FEATURES ACTUATION SYSTEM

Table of Contents

194 086

CCL

APR 2 3 1979

THREE MILE ISLAND NUCLEAR STATION

UNIT #2 OPERATING PROCEDURE 2105-1.3

SAFETY FEATURES ACTUATION SYSTEM

1.0 REFERENCES

1.1 Drawings Applicable for Operation.

1.1.1 Safety Features Actuation System, Burns and Roe Drawing No. 3091, Sheets 1 through 199.

1.1.2 Reactor Pressure Test Outputs, Bailey Meter Co. Schematic D8047760, B&R File #07-09-0822.

1.1.3 Reactor Pressure Analog Subsystem Channel 1, Bailey Meter Co. Schematic D8047775, B&R File #07-09-0810.

1.1.4 Reactor Pressure Analog Subsystem Channel 2, Bailey Meter Co. Schematic D8047776, B&R File #07-09-0811.

1.1.5 Reactor Pressure Analog Subsystem Channel 3, Bailey Meter Co. Schematic D8047777, B&R File #07-09-0812.

1.1.6 Schematic Diagram of Power Wiring and Indication Channel 1, Bailey Meter Co. Schematic D8047778, B&R File #07-09-0815.

1.1.7 Schematic Diagram of Power Wiring and Indication Channel 2, Bailey Meter Co. Schematic D8047779, B&R File #07-09-0813.

1.1.8 Schematic Diagram of Power Wiring Channel 3, Bailey Meter Co. Schematic D8047780, B&R File #07-09-0814.

1.2 Operating Procedures Applicable for Operation.

1.2.1 2102-1.3 Unit Start-Up.

1.2.2 2102-2.1 Power Operations.

1.2.3 2102-3.1 Unit Shutdown.

1.2.4 2107-1.2 Class 1E Electrical System.

194 087

1.3 Manufacturers' Instruction Manuals.

1.3.1 Bailey Meter Company, Nuclear Instrumentation and Reactor Protection System and Engineered Safeguards System Volume 1 (Spec 7).

1.4 System Descriptions.

1.4.1 Safety Features Actuation System, Index No. 50.

1.4.2 Class 1E Electrical Index No. 59.

1.5 Curves, Tables, Etc.

None.

2.0 LIMITS AND PRECAUTIONS

2.1 The associated Engineered Safety Features Systems are actuated if two of the three channels for Reactor Building Isolation and Cooling Safety (Emergency) Injection, or Reactor Building Spray Trip.

2.2 If a RB Isolation and Cooling Channel tripped automatically or is tripped manually, the same Safety Injection Channel will be actuated.

2.3 Removing an Essential Module in the Bistable Cabinets 124, 125 or 126 will cause a Safety Injection Channel trip.

2.4 Placing the Pressure Test Module, located in the Bistable Cabinets, in a condition other than "OPERATE" will cause a Safety Injection Channel Trip.

2.5 Opening a Vital Power breaker to the Bistable or Relay Cabinets will cause a channel trip.

2.6 All Safety Injection Channels must be bypassed when RC Pressure is between 1820 psig and 1650 psig to prevent inadvertent actuation of Safety Injection.

194 088

2.7 The Engineered Safety Features Actuation System Instrumentation must be operable per T.S. 3.3.2.1 in the modes delinated in Table 3.3-3. If an SFAS channel or actuation is inoperable the requirement of the applicable Action Statement must be meet within the specified time frame.

3.0 PREREQUISITES

Initial Each Step Upon Satisfactory Completion.

_____3.1 Control power is energized per Appendix C.

_____3.2 Instrument calibration is current per 2302-R2, 2302-R11 and 2302-R10.

_____3.3 Valve Line-up complete per Appendix A.

_____3.4 Panel 13 Test Switches are OFF.

4.0 PROCEDURE

4.1 Start-Up.

NOTE: With the SFAS shutdown and de-energized ESF equipment will receive an ES signal to go to its Safety Features Status. Prior to shutdown ESF pumps must be in PULL-TO-LOCK, and valves placed in their desired positions and the associated breaker at the MCC or BUS is open.

_____4.1.1 At each Bistable Cabinet (124, 125 and 126 COMPLETE the following:

_____4.1.1.1 Manual trip keyswitch is in AUTO and the key is removed.

_____4.1.1.2 The Pressure Test Module is in OPERATE.

_____4.1.1.3 All circuit breakers on the Power Distribution Panel are ON:

194 089

APR 2 3 1979

a. System AC

b. System DC

c. System Fan

_____4.1.1.4 Indicating Panel Lamps are normal as follows:

a. Vital Power ON Lamp is bright.

b. Fan Failure Lamp is dim.

c. RC Pressure Test Lamp is dim.

_____4.1.1.5 The +15VDC and -15VDC Power Supply AC Power Switches are ON, and the output meters indicate 15 volts.

_____4.1.1.6 The Auxiliary Relay Module Lamps are OFF (4 per cabinet).

_____4.1.2 RESET each Reactor Building Isolation and Cooling (RB I&C) Channel (total of 6), at Panel 3, by DEPRESSING the Green, "PROTECTION FUNCTION FULLY ENABLE" pushbuttons and VERIFY that the pushbutton backlights energize.

_____4.1.3 VERIFY that the Panel 3 indication for RB I&C is as follows for each channel.

.1 PROTECTIVE FUNCTION FULLY ENABLED "Green" - lit.

.2 CHANNEL TRIPPED "Blue" - extinguished.

.3 DEFEAT PERMIT "White" - extinguished.

.4 DEFEAT "Amber" - extinguished.

.5 DEFEAT RESET "Green" - lit.

.6 GROUP RESET "White" - lit.

_____4.1.4 At Panel 3 BYPASS each Emergency Injection Channel by DEPRESSING the Amber BYPASS pushbutton for Channels (total of 6).

194 090

001

APR 2 3 1979

____4.1.5 VERIFY that the Panel 3 indication for Emergency Core Injection is as follows for each channel.

.1 PROTECTIVE FUNCTION FULLY ENABLED "Green" - extinguished.

.2 CHANNEL TRIPPED "Blue" - lit.

.3 BYPASS PERMIT "White" - lit.

.4 BYPASS "Amber" - lit.

.5 BYPASS RESET PERMIT "White" - extinguished.

.6 BYPASS RESET "Green" - extinguished.

.7 GROUP RESET "White" - lit.

____4.1.6 VERIFY the following SFAS, Panel 13 indications:

.1 Channel and Manual indicating light power indicating lamps, "SI/RC_ _" are ON (8 lamps total).

.2 Safety Injection "RC TRIP/BISTABLE/BT 1, 2, 3 Actuation A and B BLUE lamps are ON (6 lamps).

.3 Safety Injection Actuation A and B, Channel 1/2/3, Group 1/2/3, "AUTO" (blue) lamps are OFF (18 lamps).

.4 Safety Injection Actuation A and B, Channel 1/2/3, Group 1/2/3, "TEST" (orange) lamps are OFF (18 lamps).

.5 RB Isolation and Cooling, Channel 1/2/3, TRIP lamps are OFF (6 lamps).

.6 RB Isolation and Cooling Channel 1/2/3, Group 1/2/3, "AUTO" (blue) lamps are OFF (18 lamps).

.7 RB Isolation and Cooling Channel 1/2/3, Group 1/2/3, "TEST" (orange) lamps are OFF (18 lamps).

.8 RB Spray, Channel 1/2/3 "TRIP" (blue) lamps are OFF (6 lamps).

194 091

.9 SAFETY INJECTION MANUAL ACTUATION Group 1/2/3 (blue) lamps are OFF (6 lamps).

.10 RB Isolation and Cooling Manual Actuation Group 1/2/3 (blue) lamps are OFF (6 lamps).

.11 EMERGENCY DIESEL SEQUENCE TEST (blue) lamps OFF (6 lamps).

_____4.1.7 At each Actuation's Cabinets observe that all lights outside and above the cabinet doors are ON except the ones labeled: BS-P-1A (B), 63X/RC_ _, 43/RC_ _, TB-1/RC_ _, TB-7/R_ _.

NOTE: ESF equipment may now be placed in service as required for RCS Startup.

4.2 Operation During Normal RCS Start-up.

_____4.2.1 When RC Pressure reaches approximately 1625 psig, OBSERVE the following indications:

.1 BYPASS RESET PERMIT "White" lamp goes ON for each Safety Injection Channel (6 lamps).

.2 CHANNEL TRIPPED "Blue" lamp for each Safety Injection Channel extinguishes (6 lamps).

.3 Panel 13 RC TRIP BISTABLE, BT1, 2, 3 "blue" lamps are OFF (6 lamps).

_____4.2.2 DEPRESS the BYPASS RESET "Green" pushbutton on Panel 3 for each Safety Injection Channel for Actuation A and B (6 total).

_____4.2.3 VERIFY the following after BYPASS RESET:

.1 BYPASS RESET pushbutton backlights lit.

.2 PROTECTION FUNCTION FULLY ENABLED backlights lit.

194 092

APR 2 3 1979

.3 Annunicators 13.A3 and 13.A9, Safety Injection Not Bypassed, will alarm.

NOTE: When RCS pressure is greater than 1845 psig the BYPASS PERMIT "White" lamps (6 total) will extinguish, and annunicators 13.A3 and 13.A9 will clear. If the Bypass is not removed prior to exceeding 1845 psig. it will automatically reset.

_____4.2.4 At the Bistable Cabinets 124, 125, and 126 PRESS the output memory reset pushbutton on each bistable and OBSERVE that the output memory lamp goes from bright to dim (2 per cabinet, 6 total).

_____4.2.5 PRESS the output memory reset pushbutton and OBSERVE that the output memory lamp goes from bright to dim for the 320 psi bistables in cabinets 124 and 126.

4.3 Normal Operation.

During normal unit operation the SFAS channels will remain in the PROTECTION FUNCTION FULLY ENABLED condition except during maintenance or testing which will be required to demonstrate the systems ability to actuate when required.

4.4 Operation During Normal RCS Shutdown.

_____4.4.1 The Reactor is in Hot Shutdown prior to initiating cooldown.

_____4.4.2 When RCS pressure decreases to less than 1820 psig, OBSERVE that the BYPASS PERMIT "White" lights for each Safety Injection Channel are lit.

_____4.4.3 Before RCS pressure decreases to 1650 psig, PRESS the BYPASS "amber" pushbutton on Panel 3 for each Safety Injection Channel.

194 093

APR 2 3

10

____4.4.4 OBSERVE the following Panel 3 indication for the Safety Injection Channels:

.1 PROTECTION FUNCTION FULLY ENABLED "green" lights extinguish.

.2 BYPASS RESET 'green" lamps extinguish.

.3 BYPASS "amber" lamps are lit.

.4 BYPASS RESET PERMIT "white" lamps are lit.

____4.4.5 As RCS pressure decreases below 1600 psig OBSERVE the following indications for Safety Injection:

.1 CHANNEL TRIPPED "blue" lamps are lit for each channel.

.2 BYPASS RESET PERMIT "white" lamps are extinguished.

.3 Panel 13, RC TRIP, Bistable, BT 1/2/3 "blue" lamps are lit.

____4.4.6 RCS shutdown may now be completed without interference from the SFAS.

194 094

APPENDIX A

STARTUP VALVE LINE-UP

Valve No.	Description	Position	Initial
BS-V146	Channel 1 RB Isolation Valve	OPEN	_____
YM-V22	Instrument Shutoff for BS-PS-3253	OPEN	_____
YM-V23	Instrument Shutoff for BS-PS-3256	OPEN	_____
YM-V24	Instrument Shutoff for BS-PS-3259	OPEN	_____
YM-V40	Instrument Shutoff for BS-PS-3987	OPEN	_____
BS-V147	Channel 2 RB Isolation Valve	OPEN	_____
YM-V26	Instrument Shutoff for BS-PS-3254	OPEN	_____
YM-V27	Instrument Shutoff for BS-PS-3257	OPEN	_____
YM-V28	Instrument Shutoff for BS-PS-3260	OPEN	_____
YM-V38	Instrument Shutoff for BS-PS-3988	OPEN	_____
BS-V148	Channel 3 RB Isolation Valve	OPEN	_____
YM-V30	Instrument Shutoff for BS-PS-3255	OPEN	_____
YM-V31	Instrument Shutoff for BS-PS-3258	OPEN	_____
YM-V32	Instrument Shutoff for BS-PS-3261	OPEN	_____
YM-V39	Instrument Shutoff for BS-PS-3939	OPEN	_____

APPENDIX B

Signatures of those performing/supervising valve line-up

Valve Line-up Signature Sheet

Operator Initials	Operator Signature	Shift	Date	Shift Foreman or Supervisor Sig.

194 096

APPENDIX C

STARTUP BREAKER LINE-UP

Panel	Breaker	Description	Position	Initial
2-1V	2	Cab 133 Safety Inj. Channel 1A	CLOSED	_____
2-1V	19	Cab 133 RB I&C Channel 1A	CLOSED	_____
2-1V	15	Cab 201 Safety Inj. Channel 1B	CLOSED	_____
2-1V	5	Cab 201 RB I&C Channel 1B	CLOSED	_____
2-1V	6	Cab 124 Safety Inj. Channel 1A&B	CLOSED	_____
2-1V	12	Actuation A Relay Cab lights and Fans	CLOSED	_____
2-1V	14	Panel 13 Actuation A Indicating lights	CLOSED	_____
2-2V	2	Cab 198 Safety Inj. Channel 2A	CLOSED	_____
2-2V	5	Cab 198 RB I&C Channel 2A	CLOSED	_____
2-2V	15	Cab 202 Safety Inj. Channel 2B	CLOSED	_____
2-2V	3	Cab 202 RB I&C Channel 2B	CLOSED	_____
2-2V	18	Cab 125 Safety Inj. Channel 2A&B	CLOSED	_____
2-2V	13	Actuation B Relay Cab lights and Fans	CLOSED	_____
2-2V	14	Panel 13 Actuation B Indicating lights	CLOSED	_____
2-3V	2	Cab 199 Safety Inj. Channel 3A	CLOSED	_____
2-3V	3	Cab 199 RB I&C Channel 3A	CLOSED	_____
2-3V	20	Cab 203 Safety Inj. Channel 3B	CLOSED	_____
2-3V	6	Cab 203 RB I&C Channel 3B	CLOSED	_____
2-3V	7	Cab 126 Safety Inj. Channel 3A&B	CLOSED	_____
DCC-1A	22	Cab 200 Actuation A Manual	CLOSED	_____
DCC-2A	19	Cab 204 Actuation B Manual	CLOSED	_____

194 097

TMI DOCUMENTS

DOCUMENT NO: TMI-022

COPY MADE ON 5/3/79 OF DOCUMENT PROVIDED BY

METROPOLITAN EDISON COMPANY.

WRM

Wilda R. Mullinix, NRC

7906140272

194 084