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PORC CHAIRMAN
UNIT 1

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-36
LOSS OF INSTRUMENT AIR

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THREE MILE ISLAND NUCLEAR STATION
UNIT #1 EMERGENCY PROCEDURE 1202-36
LOSS OF INSTRUMENT AIR

36.0 Discussion

The Instrument Air System is backed up by service air thru IA-V-1 which opens at 70 psi. If pressure continues to decrease to 60 psi, IA-V-26 will isolate the turbine building and intermediate building headers. Backup instrument air compressors IA-P-2A(B) are provided to supply air to critical components in the isolated sections necessary for controlled shutdown of the unit.

NOTE: This procedure would also apply in the event that piping failures rendered the backup systems, described above, inoperable. See Table I, fail position of air operated valves.

36.1 Symptoms

1. Red indicator lights for IA-P-1A/B and SA-P-1A/B on PL panel are "OFF".
2. "Instrument Air Pressure Low Turbine Area", "Instrument Air Pressure Low Auxiliary Building Area" and "Station Service Air Pressure Low" Annunciator Alarms sound on PL panel Annunciator "B".
3. Low readings at instrument air and service air pressure indicators on PL panel.

36.2 Immediate Action

A. Automatic Action

1. IA-V1 (S.A. backup to I.A.) open @ 70 psig.

2. IA-V26 (Turbine, Intermediate, Control and Out Building Supply) closes @ 60 psig.

3. SA-V5 (Fluid block and penetration pressurization backup) opens at 60 psig.

4. (ckup Instrument Air Compressor IA-P2A starts to supply air to the following valves:

CO V5, CO-V51, FW-V7A, FW-V7B, FW-V16A, FW-V17A, CO-V7, CO-', MA-V3A thru F,

and the following instruments:

LC-8	Hotwell Makeup
18E/P	Powdex Bypass Vlv. E/P
FC-7	M.F.P. A Recirc. Flow
FC-8	M.F.P. B Recirc. Flow
LC-9	Hotwell High Level Reject
SP-V2A E/P	S.U. FW vlv. A E/P
SP-V1A E/P	Main FW vlv. A E/P
SP-V3 A/B E/P	Turbine B.P. Vlv. E/P's
B/B	
C/B	
A/A	
B/A	
C/A	
ICS-36A E/P	MFP A Speed Charger E/P
ICS-36B E/P	MFP B Speed Charger E/P

5. Backup Instrument Air Compress r IA-P2B starts to supply air to the following valves:

FW-V16B, FW-V17B, EF-V30 A&B, MS-V6, EF-V8B, MS-V4A&B

and the following instruments:

PC-5	E.F.P. Steam Pressure
SP-V1B E/P	Main FW Valv. B E/P
SP-V2B E/P	S.U. FW Vlv. B E/P
SP-V4A&B E/P	Atmos. Dump Vlv. E/P
SP-V5A&B E/P	Emerg. FW Vlv. E/P

6. Emergency turbine F.W. pump starts on recirc due to steam inlet valves MSV13A (B) failing open.
7. Fluid block valves OPEN causing injection of water to NSCC and ICC water systems.
8. Reactor coolant pump trip (loss of seal injection and intermediate closed cooling water) (within approximately 10 min.).
9. Reactor trips if RC pumps trip.
10. Turbine trips if reactor trips.
11. Loss of penetration cooling (due to damper closure).
12. Loss of industrial cooling to Reactor Building (due to RB-V7 closing).

B. Manual Action

*Denotes key parameters that shall be reverified as the first step in follow-up action.

1. Reset thermal overloads and attempt to restart IA-P1A(B) and/or backup compressors.
2. If RC pumps have not tripped, take local manual control of MU-V20 in the open position.
3. Trip reactor when instrument air pressure drops to 60 psig and complete the immediate manual action in the Reactor Trip Procedure 1202-4.

*4, If RC pumps trip, verify emergency feed pumps and EF-V30A & B raise steam generator level to 21 feet (50% on the operating range).

*5. Verify that the RCS is subcooled by at least 50°F. Increase feedwater flow and makeup flow as needed to obtain 50°F margin.

36.3 Follow-Up Action

Objective:

To provide the steps needed to remove the heat from the RCS by establishing natural circulation cooling and restoring instrument air and its backup air system.

1. Reverify items in manual action designated with an asterisk (*) using redundant indication where available.
2. When Intermediate Cooling and Seal Injection flow are lost, trip all four reactor coolant pumps.
3. When all four RC pumps are off verify that the emergency feed pumps start and steam generator levels are increasing to 50%. Establish natural circulation cooling per 1102-16.
4. Verify locally that the backup instrument air compressors are operating IA-P-2A(B).
5. Add 4814 gal. of 12,250 ppm. boron or equivalent from the Tech Spec Boric Acid Tank. (This corresponds to 906 ft^3 of 8700 ppm boron.)
6. If pressurizer level cannot be maintained greater than 100 inches shift suction of makeup pump to BWST.
7. If CO-V8 fails open and condenser hotwell level is high, close CO-V13.

8. If decay heat closed purge tanks indicate high level, verify DC-V19A/B failed open due to loss of air and close DC-V20A/B to isolate purge tank makeup.
9. Continue attempts to restore instrument air, by starting either IA/SA compresser.
10. Total loss of plant instrument and service air will require the turbine jacking gear be manually engaged locally.
11. Upon restoration of instrument air, restore NS, IC and seal injection to the RCP's. Restart one RCP per loop and continue plant cooldown.
12. Restore secondary plant to normal and direct steam flow to the condenser via the turbine bypass valves.

TABLE I

Air Operated Valve No.	Air Fail Position
MU-V3	Closed
MU-V4	Closed
MU-V6A	Closed
MU-V6B	Closed
MU-V9	Closed
MU-V10	Closed
MU-V11A	Closed
MU-V11B	Closed
MU-V17	Closed
MU-V18	Closed
MU-V20	Closed
MU-V26	Closed
MU-V32	Open
MU-V51	Closed
IC-V3	Closed
IC-V4	Closed
IC-V5	Fail As Is
IC-V6	Closed
IC-V74	Open
DC-V19A	Open
DC-V19B	Open
FW-V17A	Fail As Is
FW-V17B	Fail As Is
EF-V30A	Fail As Is
EF-V30B	Fail As Is

TABLE I (Cont'd)

Air Operated Valve No.	Air Fail Position
WDG-V24	Closed
WDG-V25	Closed
WDG-V26	Closed
WDG-V27	Closed
WDG-V28	Closed
WDG-V29	Closed
WDG-V54	Closed
WDL-V49	Closed
WDL-V50	Closed
WDL-V51	Closed
WDL-V61	Closed
WDL-V89	Closed
WDL-V91	Closed
WDL-V92	Closed
MS-V3A	Closed
MS-V3B	Closed
MS-V3C	Closed
MS-V3D	Closed
MS-V3E	Closed
MS-V3F	Closed
MS-V13A	Open
MS-V13B	Open
FW-P1A	Minimum Gov. Speed
FW-P1B	Minimum Gov. Speed

TABLE I (Cont'd)

Air Operated Valve No.	Air Fail Position
IC-V3 IC-V4 IC-V6	1. Valve can be positioned open under loss of air conditions.
MU-V20 MU-V26	2. Valve remains open for at least 10 min.