THREE MILE ISLAND NUCLEAR STATION
UNIT #2 EMERGENCY PROCEDURE 2202-2.5

OTSG TUBE RUPTURE
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Unit 1 Staff Recommends Approval

Approval [NA] Date —
Cognizant Dept. Head

Unit 2 Staff Recommends Approval

Approval [NA] Date —
Cognizant Dept. Head

Unit 1 PORC Recommends Approval

[NA] Date —
Chairman of PORC

Unit 2 PORC Recommends Approval

[RP Warren] Date 10/16/78
Chairman of PORC

Unit 1 Superintendent Approval

[NA] Date —

Unit 2 Superintendent Approval

[GP] Date 10/16/78

Manager Generation Quality Assurance Approval

[NA] Date —
THREE MILE ISLAND NUCLEAR STATION
UNIT #2 EMERGENCY PROCEDURE 2202-2.6
OTSG TUBE RUPTURE

1.0 SYMPTOMS
A. Initial loss of reactor coolant pressure and decrease in
pressurizer level becoming stable after short period of time.
B. Make-up tank level decreasing
C. VA-R748 off gas monitor alarm.
D. Secondary sample analysis indicates activity in the secondary
side.

2.0 IMMEDIATE ACTION
A. Automatic Action
1. MU-V17 will open to compensate for reduced pressurizer
level.
B. Manual Action
1. Verify MU-V17 is maintaining pressurizer level at 220".
   Close MU-V376 and start an additional make-up pump if
   pressurizer level drops to 200".
2. Verify VA-R748 alarm.
3. Notify Unit I Control Room and isolate steam to Unit I by
   closing AS-V23.
4. Direct chemistry department to sample both OTSG's and
   analyze for radioactivity $\beta\gamma$, $^3\text{H}$, I-133, Cs-137) to
determine which OTSG has the leak.
5. Using an RM-14, or equivalent instrument, take a gamma
   reading in each steam line outside the Reactor Building.
   Attempt to take the readings on each steam line as close
   to the same relative position as possible.
6. Based on the readings taken in 4 above, attempt to determine which OTSG has the leak.

7. If make-up-tank level is decreasing at greater than 10 GPM (1 inch/3 minutes) and VA-R748 is in alarm, immediately begin reducing load at 10%/minute.

8. CLOSE the affected OTSG's atmospheric dump valve isolation valve (MS-V1A or B) to eliminate the potential of leakage and an unwarranted release.

9. If desired to aid in determining which OTSG is leaking, dump all MSR drains to the condenser per 2106-3.1.

C. Follow-Up Action

1. If make-up-tank level is not decreasing at greater than 10 GPM, calculate the RCS leak rate per Surveillance Procedure 2301-301. If the identified leak rate exceeds 10 GPM or primary to secondary OTSG tube leakage exceeds 1 GPM or unidentified leakage exceeds 1 GPM proceed with Technical Specification 3.4.6.2 Action Statement.

2. If make-up-tank level is decreasing at greater than 10 GPM and VA-R748 is in alarm proceed as outlined below.
   a. At 15% power place diamond in manual and fully insert the regulating groups 7, 6, and 5 (this is to reduce likelihood of lifting secondary safety valves).
   b. While reducing Rx Power to zero by inserting rod groups 7, 6, and 5, go to manual on the turbine bypass valves and open the turbine bypass valves to take steam from the turbine and thereby reduce load.
CAUTION: Do not increase OTSG Levels to 97-99% on the Operating Levels to avoid a possible R.C.S. Boron Dilution Accident during subsequent plant cooldown.

c. Trip the turbine. Then place the turbine bypass valves back to automatic and verify the turbine bypass valves maintain header pressure at 895 psig.

d. Follow up on chemistry analysis requested in Step 4 of manual action. Verify that gamma analysis has been performed in accordance with HP-1950 on samples taken from below listed points. For a large rupture (greater than 50 gpm leakage) the leaking OTSG level will hang up. For smaller leaks (Sodium-24) chemistry analysis will have to be used to determine which OTSG has the leak.

Steam Generator Inlet A
Steam Generator Inlet B
Main Steam A
Main Steam B
Secondary Side Stm. Gen A
Secondary Side Stm. Gen B

e. Isolate the effected OTSG by closing the following on the effected OTSG when RCS Th is <545°F.

Main FW Reg. Valve  FW-V30 A or B
Main FW Block Outlet Valve FW-V17 A or B
S.U. FW Reg. Valve FW-V25 A or B
S.U. FW Block Inlet Valve FW-V25 A or B
S.U. FW Block Outlet Valve  FW-V19 A or B
Bypass FW S.V. Valve  FW-V66 A or B
Emerg. FW Reg. Valve  EF-V11 A or B
Emerg. FW Block Valve  EF-V12 A or B
Emerg. FW Reg. Valve Bypass  EF-V33 A or B
Emerg. FW Block Valve Bypass  EF-V32 A or B
Turbine Bypass Valves  MS-V25 A or B
Turbine Bypass Block Valves  MS-V26 A or B
Turbine Bypass Block Valves  MS-V23 A or B
Main Stm. Isolation Valves  MS-V24 A or B
Main Stm. Isolation Valves  MS-V3 A or B
Stm. Gen. Reheat Stm.  MS-V15 A or B

Isolation Valves
Assure the FW pump for the unaffected OTSG is running, or run the FW pumps off of Auxiliary steam.

CAUTION: The "A" FW Pump Turbine receives HP Steam from the "B" OTSG and the "B" FW Pump Turbine receives HP Steam from the "A" OTSG.

NOTE: Monitor isolated steam generator pressure, and if it approaches 1050 psig (MS relief valve setpoint), re-establish a flowpath to the condenser via the turbine bypass valves.

f. Take manual control of main and startup reg. valves and adjust unaffected OTSG level as needed to obtain a lave of 532°F.
g. Place Pressurizer Pressure Controller in manual and adjust output to maintain RCS Pressure at 1850 psig. Turn pressurizer heater banks 4 & 5 off.

NOTE: This will aid in lowering primary to sec. leak rate.

h. Open the MU pump suction valve from the BWST DH-V5 A and B and isolate MU-V12 if required, due to low make-up-tank level.

i. Begin a cooldown to cold shutdown as soon as possible in accordance with 2102-3.2 to minimize inleakage to the affected OTSG.

j. Open breakers for the following sump pumps to terminate any potential radioactive release:
   - Turbine Building Sump Pumps
     - SD-P-1A Unit 3B MCC 2-31A
     - SD-P-1B Unit 9C MCC 2-41A
   - Control Building Area Sump Pumps
     - SD-P-3A Unit 4B MCC 2-31C
     - SD-P-3B Unit 5C MCC 2-41C

k. CLOSE the following valves:
   - SD-V48 Control Building area sump discharge to non-radioactive waste treatment building sump.
   - SD-V38 Turbine Building Sump discharge to non-radioactive waste treatment building sump.
   - WDL-V1160 Secondary Chem. Lab drain to control and service building sump.
1. OPEN or insure OPEN the following valves:
   - WT-V123A(B) Cond. Polisher reg. sump discharge to
     WDL misc.
   - CAUTION: Insure spool piece is in place between
     WDL-V403(404) and WDL-V361.
   - WDL-V403(404) Cond. Polisher reg. sump discharge to
     WDL Misc. spool piece isol.
   - WDL-V361 Cond. Polisher reg. sump discharge to WDL-F
     8A/B.
   - SD-V29A Control Building area sump discharge to
     condensate polisher regeneration sump.
   - SD-V28A Turbine Building sump discharge to Cond.
     polisher reg. sump.
   - WDL-V1159 Secondary Chem Lab Drain to Cont. Drain
     Tanks.

m. Insure WT-R3894 and 3895 are operating properly to
direct radioactive wastes to the WDL Misc. System.

n. CLOSE BREAKERS OPENED IN STEP h.

o. Notify Health Physics to begin surveys of the Control
   Building area and Turbine Building to determine the
   need for controlled areas. Initiate Emergency Plan
   if required, as a result of the surveys.