

ENCLOSURE

NRC INSPECTION REPORT 50-397/98-05  
ATTACHMENT 2

"DETAILED CHRONOLOGY OF MARCH 11, 1998, MAIN STEAM  
LINE ISOLATION VALVE CLOSURE AND REACTOR SCRAM"

CORRECTION

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## ATTACHMENT 2

### DETAILED CHRONOLOGY OF MARCH 11, 1998 MAIN STEAM LINE ISOLATION VALVE CLOSURE AND REACTOR SCRAM

March 10      Reactor power at 100 percent

Day            The licensee noted an increase in the containment instrument air (CIA) usage (from 1 to 1.5 SCFM) and began reviewing the potential causes for the increased usage.

March 11      Reactor power was at 100 percent and all safety systems were available and in standby.

05:16:05      Main Steam Isolation Valve 22D fast closed on loss of containment instrument air (CIA) nitrogen supply to the valve operator.

05:16:10      A reactor scram signal was generated on an average power range monitor (APRM) high flux of 118 percent.

05:16:11      Nuclear steam supply system (NSSSS) isolation and all main steam isolation valves close on high main steam line flows.

05:16:13      Reactor pressure increases to 1085 psig and 2 safety relief valves automatically actuate to reduce pressure. Each safety relief valve properly reseats.

05:16:14      The high pressure core spray diesel generator started on Level 2 (-50 inches reactor vessel level narrow range).

05:16:15      The reactor core isolation cooling and high pressure core spray systems initiated and subsequently began injection into the reactor vessel. A main turbine trip was initiated and the reactor closed cooling system pumps tripped and was isolated from the drywell, resulting in a loss of drywell cooling. A slow increase in drywell pressure begins because of the loss of the drywell coolers.

05:16:16      Four control rod position indications were lost, requiring operators to verify the control rods had fully inserted using the rod worth minimizer. All control rods subsequently indicated full in.

05:16:38      The reactor core isolation cooling system reached maximum flow at 860 gallons per minute.

05:17:17      The reactor core isolation cooling system automatically isolated on high reactor vessel level by closing the steam admission Valve V-45.



- 05:17:18 The high pressure core spray injection Valve 4 automatically closed on high reactor vessel level.
- 05:19:00 The operators started residual heat removal Pump A and service water Pump 1A in the wetwell cooling mode .
- 05:26:00 The standby gas treatment system was started to reduce drywell pressure by venting.
- 05:26:59 The reactor core isolation cooling system tripped when manually initiated.
- 05:27:21 Drywell pressure increased to approximately 1.65 psig resulting in engineered safety feature actuation of the Division II emergency diesel generator.
- 05:28:00 The operators were able to restore the reactor closed cooling system and established drywell cooling for pressure reduction.
- 05:28:29 The operator was subsequently able to reclose the reactor core isolation cooling system trip and throttle valve from the control room and reinitiate the system.
- 05:28:35 Drywell pressure increased to approximately 1.65 psig and resulted in the engineered safety feature actuation of the Division I emergency diesel generator.
- 05:29:08 The high drywell pressure engineered safety feature actuation signals cleared on decreasing drywell pressure.
- 05:38:00 Standby gas treatment system secured.
- 05:54:00 High pressure core spray pump secured
- 05:58:00 The operators reset the reactor scram.
- 06:00:00 The high pressure core spray emergency diesel generator was secured. Earlier, the emergency diesel generator restarted when the system was shutdown prior to resetting the initiation circuitry
- 06:07:00 A reactor protection action signal initiated on low reactor vessel level. The reactor core isolation cooling system could not be operated in the recirculation mode resulting in difficulty in controlling reactor vessel level between plus 13 inches (low level) and plus 54 inches (high level).
- 06:11:00 The licensee made a four hour nonemergency notification that a reactor protection system actuation had occurred from a main generator lockout.



07:30:00 Pressure and temperature indicated cooldown had exceeded the allowable pressure and temperature curve

07:37:00 Main steam isolation valves opened (except 22D) and main turbine bypass valves placed in auto.

07:41:00 Operators placed reactor pressure vessel level control in auto.

07:44:00 Reactor core isolation cooling injection secured.

07:45:00 Pressure and temperature within area on the cooldown curve

09:00:00 Pressure and temperature exceeds the allowable limits established by the pressure and temperature curve

09:11:00 10 CFR 50.72(b)(2)(ii) 4-hour non-emergency notification of RPS actuation (scram)

10:24:00 Reactor water cleanup system placed back in service with the demineralizes bypassed.

10:28:00 10 CFR 50.72 (b)(2)(ii) and (iii) 4-hour nonemergency notification of a second RPS actuation and an engineered safety feature actuation involving a reactor pressure level low level scram

10:30:00 Pressure and temperature returned to the to the right of the pressure and temperature curve (acceptable limits) based on temperature indications provided by the reactor water cleanup system.

11:13:00 Started reactor recirculation Pump 1A establishing forced circulation.

March 12

02:00:00 Plant entered Mode 4.

20:42:00 Event updated report to the NRC operations officer which provided supplemental and corrected information.