Lanning
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3/21/01

U.S. NUCLEAR REGULATORY COMMISSION
INDIAN POINT 2 NUCLEAR POWER PLANT
RESIDENT INSPECTOR'S OFFICE

FACSIMILE TO: PETER SELGROTH

IN THE OFFICE OF: DRP

TELECOPY NO.: _____

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SUBJECT: PRELIM. ROOT CAUSES FROM CON-ED SL1 INVESTIGATION & LER

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A/23

Data back by Mr. Natural Cond. SATISFACTORY

Root Cause Statement No. 1 – Equipment Response

Operators were hampered or delayed by inoperable and malfunctioning equipment, e.g.,

- High pressure condenser dump valve controller — As-found setback SAT. Nuisance over the weekend
- MS-1-24 main steam isolation valve
- Steam jet air ejector pressure control valve
- Isolation valve seal water system → Still looking / Balances with design – Hanlon

Delay CSD

As a result, proceeding to cold shutdown took approximately 23 hours (actual) instead of 16 hours (ideal), and included 8 hours during which flow into 24SG from the RCS resumed.

Basis: Cooldown Extrapolation

Factual Basis:

Fact	Date	Time	Source
1. Operator placed the steam dump controller in pressure mode and in the automatic mode this would put it in the control of the pressure transmitter	2-15-00	2100	Operator statement
2. With the steam dump control in automatic, as the secondary side pressure decreased, there would be a decrease in the controller output corresponding with a decrease in steam flow			System description
3. Shift manager stated he only noticed one light on steam dumps during event.			SM Interview
4. Pressurizer pressure master controller failed to full sprays open when in procedure for depressurization of RCS to match RCS pressure with ruptured steam generator pressure. Individual spray controllers were placed in manual and closed. Master controller did not respond again until next shift.			CR 200001214 — Investigation on Chronology
5. High pressure steam dumps controller opened and closed about 25% at a time controlling pressure in "batches" not responding properly. Controller was placed in manual.			CR 200001215
6. On 3/1/00, special testing was conducted on valve PCV-1137 (24SG Atmo. Steam Dump) and its associated instrument control loop. Testing was performed by I&C under test no. P-MT-183 and by Crane MOVATS under work order no. NP-00-14319. The testing resulted in inconclusive and inconsistent data and subsequently a long analysis period. This CR is to document the results of the test.	Operator Performance		CR 200001466 — ** Are they stuck?
7. Based on testing described in CR# 200001466, additional investigation and testing was performed on PC-449 located in the CCR in panel FBF. This testing resulted in finding PC-449 malfunctioning. Degraded capacitors are suspected. I&C action requests have been generated (see references) to inspect controllers and replace capacitors or entire controller.			CR 200001628

Management Weak & Significant

	Fact	Date	Time	Source
8.	I&C completed work package for WOD# 00-14446 for the RHR temp recorder being out of calibration. When the recorder was returned and placed I/s the inlet temp reads 102F and the outlet temp is reading 102F. The same temps as read by SAS are inlet 102F outlet 66F using the same inputs this shows that there is a delta Temp of 16F which is not reflected on the chart recorder TR-636 which is used for Tave indication when RHR is I/S. So even though the PMT for TR-636 passes, per the I&C work package, due to it being within its tolerance this is not acceptable to operations as a norm. Reference CR 200001537, which indicates the same problem where the indicated values push the operator into a workaround where none existed before. The solution is to either narrow the acceptable band and or calibrate the indication with the actual input instead of trying to do them separately.	Withdrawn		CR200001537
9.	24 SG pressure continued to decrease and level in 24 SG continued to increase.	2-16-00		Plant data
10.	Operators initiated mechanical isolation of 24 S/G	2-15-00	20:18	A.O.I. 1-2
11.	Operators instructed to isolate MST-4	2-15-00	20:23	A.O.I. 1-2
12.	CCR secured AFW flow to 24 S/G	2-15-00	20:25	A.O.I. 1-2
13.	Operators completed isolating 24 S/G	2-15-00	20:34	A.O.I. 1-2
14.	24 S/G pressure reached 1023 psig	2-16-00	20:59	Plant data
15.	Gamma isotopic analyses of water obtained from Main Steam Trap 23, the Drains Collection Tank, and the hotwells indicate the presence of radio-gas dissolved in the water. The relative concentration of the radio-gas is highest in Main Steam Trap 23 with the hotwell having the least activity. These differences in concentrations may suggest that there is some leak by MS-1-24.			CR 200001118
16.	With no other source of cooling present, the 24 SG pressure decrease could only have been caused by leakage past the shut main steam stop valve, MS-1-24.			Plant data
17.	OE from Palo Verde and Ginna discussed long period of time to cooldown affected s/g using backfill method.			OE
18.	A cool down of the plant was started per step 5a of EG-3.1 to bring the system into a cold shutdown condition.	2-15-00	23:36	EG 3.1
19.	The cool down was stopped when condenser vacuum was lost due to back firing of the steam jet air ejectors (SJAE).	2-16-00	00:05	Operator logs
20.	As steam pressure changed (lowered) in the main header with the plant cool down, the supply pressure to the SJAE changed as well, and steam supply pressure dropped below the point where the SJAE could efficiently remove non-condensable gases from the main condenser.			Plant data
21.	Main condenser vacuum was re-established.	2-16-00	01:15	Various logs
22.	Cooldown had been continued on the steam generator atmospherics. Condenser vacuum was subsequently restored about an hour later. The loss of condenser vacuum may be attributed to the steam supply to the sjae's to be in manual on the bypass. WO 94-69637 for pcv1222 (steam supply to sjae) had been canceled due to pending retirement. This should be re-evaluated.	2-16-00	0812	CR 200000984

Fact	Date	Time	Source
23. Vacuum was restored to the main condensers, and primary plant temperature maintenance was returned to the steam dumps	2-16-00	08:52	Plant Log
24. The IVSWS is activated on a containment phase "A" isolation signal. This type of signal closes selected vapor containment penetration valves to prevent potential contamination from leaving the containment after an accident.			System description
25. The IVSWS then places pressurized water from its own seal water tank between the paired containment isolation valves. The purpose of this is to ensure that if any potential valve leakage did occur, the IVSWS water would leak into the leakage path, and ensure no contamination release occurred.			System description
26. When the manual safety injection occurred, this also caused a containment phase "A" isolation.	2-15-00	21:04	Plant data
27. Several valves sealed with IVSWS water in the Component Cooling Water System (CCW) for the Reactor Coolant Pumps are not isolated by a phase "A" isolation signal. They are isolated by a phase "B" containment isolation signal.			System description
28. There was no phase "B" demand signal present or required during this event.			System description
29. The IVSWS seal water flowed into the open CCW containment isolation valves and from there into the CCW system. This flow required periodic IVSWS tank refilling as long as the system is actuated.			Operator statement
30. Operator found the Isolation Valve Seal Water Tank to be empty on 02/15/00. He attempted to fill the tank and it subsequently emptied again. The Control Room operator noticed that the Component Cooling Surge tank level had increased a corresponding amount.	2-17-00	03:40	CR 200001026
31. The operators took guidance from the POP 3.1 to realign the Isolation Valve Seal Water system for normal operation by placing the switches to Close.			POP3.1
32. On 2/16/00 at 02:20, IVSW LCO entered for tank being empty entered TS 3.0.1. Exited at 9 05 as tank parameters were restored.	2-17-00	05:17	CR 200001033
Other equipment issues identified during the event			
33. Pressurizer Master controller broke in the full open position.	2-16-00	08:15	Operator debrief
34. Observed elevated temperature (approximately 80F) in the AFP room on 2/16 with the motor-driven pumps in service.	2-17-00	10:30	CR 200001051
35. The winterization plan for the AFP room covered the fresh air inlet to the room and raised the fan thermostat settings.			

Fact	Date	Time	Source
36. Wood had been placed over the ventilation louvers for the ABFP room (east side wall to feed reg. valve area). SOP 11.5, winterization calls for wood to be placed over louvers on the east side wall to prevent cold air intrusion into the feed reg. valve area. With the ABFPs in service for an extended time during the SGTR event, it was reported that the ABFP room was getting warm. The wood to the ABFP room louvers was subsequently removed to allow cooling of the ABFP room with the pumps operating. The wood was then replaced to restore what was assumed to be proper winterization configuration. The question arises as to whether placement of this wood is appropriate for ABFP operation during an event such as the SGTR.			CR 200001365
37. While performing tube rupture recovery actions, operators noted these anomalies: • 21 RCP High vibrations – 14 mils • 23 RCP seal return less than 0.2 gpm for approximately 2 minutes. • Pressurizer master controller PC-455K did not work in manual. • DMIMS alarm came up after 22 RCP was secured.			CR 200001137
38. The two is true white light indication for valve 956G will not illuminate. This problem was found during the reactor manual trip.			CR 200000997
39. The two is true lights for valve 1788 will not illuminate. Problem found during the manual reactor trip.			CR 200000998
40. The two is true lights for valve 1789 will not illuminate. Problem found during the manual reactor trip.			CR 200000999
41. The two is true red indicating light for FCV-437 will not illuminate. Problem found during manual reactor trip.			CR200001000
42. The two is true white indicating light for PCV-1216 will not illuminate. Problem found during the manual reactor trip.			CR200001001
43. The two is true red indicating light for PCV-1229 will not illuminate. Problem found during the manual reactor trip.			CR200001002
44. The two is true red indicating light for SOV-3519 will not illuminate. Problem found during the manual reactor trip.			CR200001004
45. The two is true white indicating light for HC-IV5A will not illuminate. Problem found during the manual reactor trip.			CR200001005
46. The two is true white indicating light for HC-IV3A will not illuminate. Problem found during the manual reactor trip.			CR200001006
47. The two is true red indicating light for SOV-3421 will not illuminate. Problem found during the manual reactor trip.			CR 200001007
48. The SJAE discharge isolation valve was slow to close. This occurred during Phase A Containment Isolation.			CR 200001008
49. Excess Letdown CCW Isolation Valve 793 Control Indicating Circuit is blowing fuses. There is currently no indication of valve position on panel SG and Panel SN in the CCR. Please investigate and repair.			CR 200001023

what's collective significance

collective

30 mg no longer invalid

Fact	Date	Time	Source
50. The fire alarm for Zone 1, 23 RCP was received at approximately 0300 this morning. I was directed by the CRS to investigate the alarm in the VC. No visible fire was observed. On further investigation, I noticed that what I believe is the third detector in series on 93' elevation of 23 RCP platform was blinking, and the other two detectors were not. I believe the cause of the alarm was a faulty detector.			CR 200001028
51. Leakage in the VC sump during the 24 S/G tube leak event caused the sump pumps to energize. Due to the phase A signal, the sump pump was not removing water from the VC sump. Entered TS 3.0.1 on 2/16/00 at 22:34, did not meet TS 3.3.C, by placing the sump pump control switches to off. The increase in level was due to seal 2 leakage on RCP's, plus the VC coplng off.			CR 200001037
52. Exited 3.0.1 for the Containment sump pumps at 6:30 on 2/16 when both pumps were returned to stand-bye.			CR 200001037
53. During the 3.0.1 for containment sump pumps, R41 and 42 were inoperable for a short time but restored prior to restoring containment sump pumps. (Phase A made them inoperable restored during resetting of phase A).			CR 200001037

Why is this support? Is the design of plant

One overlooks inoperability

** Why is this not a design issue

Decision Concerns should not document.

What is policy for voluntary LCO's (Spec. TS3.0.1)

Open Questions | Why are Analyses Adequate

MS 1-24

Root Cause Statement No. 2 – Personnel Response

The plant lost focus on the need to reduce RCS pressure and temperature as directed in ES-3.1. There were distractions that included communication problems with the TSC, conflicting boron concentration values at turnover, conflicting procedural requirements regarding RCS pressure limitations to RHR, insufficient guidance for closure of the 822 valves, and the performance of PT-V14 to enter OPS. As a result, proceeding to cold shutdown took approximately 23 hours during which during which time there was additional flow from the RCS into 24 SG.

Factual Basis:

	Fact	Source
1.	Operator initiated a 30-40 degree cooldown at 2100.	Operator statement
2.	Cool down initiated at 2102 exceeded POP 3.3 requirements, resulting in a loss of pressurizer level and requiring a manual safety injection.	CR200001575
3.	The cool down was stopped for approximately six hours, allowing the ruptured SG to overfill.	PI graphs
4.	SL-1 team review showed the sequencing of procedures through the event to be procedurally logical.	Team review of affected procedures
5.	Prior to the manual SI, the CCR operators determined that POP 3.3 would need a TPC to allow cooldown to proceed while boron concentration did not comply with RCS-4. Changing plant conditions obviated the need for this TPC.	Archived logs, OAD23 notes
6.	On 2/15/00 the station experienced a Steam Generator Tube Rupture in Steam Generator 24. The plant experienced a Safety Injection which resulted in an average cooldown rate in the reactor cool temperature of approximately 103 F/hr at 2131 in Loop 3. Tech Spec 3.1.B.1 states "The reactor coolant temperature and pressure and system heatup and cooldown rates (with the exception of the pressurizer) averaged over one hour shall be limited in accordance with Figure 3.1.B-1 and Figure 3.1.B-2 for the service period up to 21.63 effective full-power years. The heatup or cooldown shall not exceed 100 F/hr". On 2/16/00 at 1255 as the plant continued the cooldown process the Auxiliary Spray valve was open allowing water from the Regenerant Heat Exchanger to flow to the Spray Line. The temperature difference between the Spray Line and the Pressurizer steam space as indicated by the Plant Information System (PI) was 322 F. Tech Spec 3.1.B.5 states "The pressurizer heatup and cooldown rates averaged over one hor shall not exceed 100 F/hr and 200 F/hr, respectively. The spray shall not be used if the temperature difference between the pressurizer and the spray fluid is greater than 320 F."	CR 200001575

	Fact	Source
7.	Once 24 S/G was isolated and MSIV-1-24 closed, the AOI has operations use POP-3.3 to cool-down. The POP is for a normal shutdown and requires minimum shutdown boron concentration per graph RCS-4 to be met prior to cooling down. With a tube leak, it's imperative that the cool-down be established and pressure reduced to stop the primary to secondary leak. Boron was being added to the RCS through charging to ensure the limits per RCS-4 would be met as soon as possible, but delaying the cool-down until this point was reached would result in filling 24 S/G further and risk lifting the atmospheric relief valve. The cool-down was started with SM approval prior to reaching the RCS-4 limit for boron. The cool-down and depressurization was required to prevent 24 S/G from filling further. As the cooldown was begun, pressurizer level dropped due to a rapid cooldown of the RCS system. This resulted in the need for a manual SI due to Pressurizer level approaching 9 %. This returned the operators to E-0, then into E-3, where the requirements to meet RCS-4 prior to starting the cool-down are not required. Boron was continuously added to ensure we would meet RCS-4 requirements. RCS-4 was verified in ES-3.1, later in the EOP procedures	CR 200001024
8.	In the course of trying to establish RHR, the operators found CCW valves 822A & B were still open as a result of the safety injection that had occurred earlier, but could not find procedural guidance to close the valves.	Operator statement
9.	Neither E-3 nor SOP-RHR 4.2.1 contain a step to re-position these valves as required if an SI has occurred. By comparison, the NYPA version of E-3 includes a step to close the 822A&B valves if an SI has occurred.	Con Ed E-3, SOP4.2.1 & NYPA E-3
10.	It is common knowledge among the operators that RHR flow control valves HCV-638 and 640 do not fully isolate RHR flow when closed. This condition created a need to generate a TPC to allow the closure of the 747 valve to isolate RHR flow if needed.	Archived logs
11.	Existing revisions of the operating procedures did address the concerns identified in SOER 93-01, Industry Steam Generator Tube Leak Events	Team review of affected procedures
12.	SL-1 team review of PT-V14 identified adequate controls over the positioning of MOV-535 and 536.	V14, Archived logs
13.	RHR is the normal cool down system used to bring the plant to cold shutdown (less than 200 F) and maintain core cooling when in cold shut down.	System description
14.	Step 9 of ES-3.1 requires RCS pressure to be less than 300 psig and RCS temperature less than 350 F prior to placing the Residual Heat Removal (RHR) system in service. Step 9 said that when these conditions were met, to place the RHR system in service per Standard Operating Procedure (SOP) 4 2.1 "Residual Heat Removal System."	ES-3.1
15.	SOP 4.2.1, step 2.5, requires RCS pressure to be less than or equal to 450 psig to place RHR in service.	SOP 4.2.1
16.	SOP 1.3 "Reactor Coolant Pump Startup and Shutdown" step 2.10, requires that the reactor coolant pumps be tripped if RCS pressure drops below 350 psig.	SOP 1.3
17.	In order to meet the more restrictive RCS pressure limits of ES-3.1 for RHR operation, the reactor coolant pumps would have to be secured prior to placing RHR in service. Reactor coolant pump operation is required for normal pressure control of the reactor coolant system. Securing the Reactor Coolant Pumps would remove normal pressure control and require the use of alternate pressurizer spray via the charging pumps for pressure control.	SOP 1.3
18.	When ES3.1 was revised to change RCS pressure from 400 to 300 psig, in Dec 1999, a V&V was not performed since the change was considered to be administrative.	
19.	When ES 3.1, Backfill from Steam Generator, was entered from step 44 of E-3, 24 RCP was in service.	TSC Log

Informed Mgmt. Change

C/U
*Inf. Contrary

Fact	Source
20. Continuation of ES-3.1 was delayed for 1 hour and 26 minutes while relief was sought from Westinghouse to allow initiation of RHR with RCS pressure between 380 and 400 PSI.	Attachment A Sequence of events
21. This procedural conflict was not identified during simulator training prior to the event.	
22. The value of RCS pressure required by NYPA's IP3 ES-3.1 procedure is 400 psig. This value is supported by the Westinghouse Owners Group Emergency Response Guidelines.	NYPA ES-3.1 and WOG guidelines
23. At 08:52 Westinghouse was contacted via a conference call between Eric Frantz, Rich Prokopvich, and Jeff Stukus. M.Miller and W. Durr provided the Westinghouse personnel with current unit conditions as well as procedural information. Upon coming to an understanding of the situation Westinghouse concurred that for the given plant conditions it is just as safe to use the normal primary system setpoints to place RHR in service	CR 200001012
24. A Fax was received from Westinghouse providing documentation of the aforementioned conference call conclusion at 11:44 AM WEnty	CR 200001012
25. OAD 23 operator statements are silent on initiation of cooldown.	OAD23 forms
26. On 02/16/00, during the cooldown of the Reactor Coolant System per Emergency Operating Procedure ES 3.1 Post SGTR Cooldown, it was determined that the Technical Specification required Reactor Coolant System Overpressure Protection System would have to be considered inoperable at less than the required Reactor Coolant System temperature of 305 degrees. The system is inoperable at present due to the inadequate size of the nitrogen supply to the Pressurizer Power Operated Relief Valves and the two required surveillance tests not having been performed. To comply with Technical Specifications, the Reactor Coolant System temperature, pressure, and level are required to be operated in accordance with graph 3.1.A-2. This also requires that the three Safety Injection Pumps and two of the Charging Pumps be de-energized. This was determined to be acceptable while operating within the Emergency Operating Procedures, as at this point in the procedures, the Safety Injection signal has been reset, the Safety Injection pumps were secured, and re-initiation of Safety Injection requires the operator to manually start equipment as necessary. The Safety Injection pumps switches and Charging Pump switches were placed in Pullout and Caution Tags were applied to comply with Technical Specifications.	CR 200001025 *AOM Need Follow TS Then FIX MOD DISTRACTIONS
27. TOI 265 (and SOP 1.2) state "If actual hot calibrated and actual cold calibrated pressurizer levels are not within 15 percent . . . " Graph RCS 3A that would be used to determine "actual hot calibrated" level, does not have a line for conditions below 300 degrees. It would be helpful if a line for 70 degrees could be added to graph RCS 3A.	CR 200001164
28. During the cooldown and depressurization associated with 24 Steam Generators tube leak, operators were encumbered by the fact that the OPS system was not operable. It has always been our practice to defer OPS testing until just prior to a cold shutdown outage. Without testing, OPS can not be considered operable. Tech Specs limit the number of energized Charging Pumps and restricts the Pressurizer level and temperature. This is an operator work-around when an unanticipated cooldown is required.	CR 200001236

Contributing Cause 2-1 – Leak vs. Rupture Flow Rates

Preparations, procedures, and training focused on either a gradually increasing leak (3 – 50 gpd) or a gross SG tube rupture (~400 gpm). As a result, operators were not fully prepared to identify and respond to the smaller volume rupture that occurred (~100 gpm).

Factual Basis:

Fact	Date	Time	Source
1. Operator training has mainly been on large break SGTR scenarios. There has been little small break training provided.			Various license holders
2. After the plant trip, the Watch Engineer stated, the leak had substantially decreased, eliminating any indications to initiate an SI signal.			Watch Engineer statement
3. Operators initiated a cool down in accordance with POP 3.3 cool down requirements, resulting in loss of pressurizer level.			Plant data
4. On 2/15/00 the station experienced a Steam Generator Tube Rupture in Steam Generator 24. The plant experienced a Safety Injection, which resulted in an average cooldown rate in the reactor cool temperature of approximately 103 F/hr at 2131 in Loop 3. Tech Spec 3.1.B.1 states "The reactor coolant temperature and pressure and system heatup and cooldown rates (with the exception of the pressurizer) averaged over one hour shall be limited in accordance with Figure 3.1.B-1 and Figure 3.1.B-2 for the service period up to 21.63 effective full-power years. The heatup or cooldown shall not exceed 100 F/hr". On 2/16/00 at 1255 as the plant continued the cooldown process the Auxiliary Spray valve was open allowing water from the Regenerent Heat Exchanger to flow to the Spray Line. The temperature difference between the Spray Line and the Pressurizer steam space as indicated by the Plant Information System (PI) was 322 F. Tech Spec 3.1.B.5 states "The pressurizer heatup and cooldown rates averaged over one hour shall not exceed 100 F/hr and 200 F/hr, respectively. The spray shall not be used if the temperature difference between the pressurizer and the spray fluid is greater than 320 F."	2-15-00	2131	CR 200001575
5. RO stated he had started a Cooldown with the Steam Dumps in automatic in the pressure mode.			Operator interview
6. RO stated that the other RO on the shift commented on the controller being in auto verses being in manual.			Operator interview
7. The RO stated that he wanted to operate the controller in auto because it was designed to operate as such.			Operator interview
8. During the cooldown pressurizer level slowly decreased to approximately 9% at which time the Control Room Supervisor (CRS) directed him (RO) to manually initiate SI.			Operator interview
9. The RO stated that the steam dumps have a history of erratic operation.			Operator interview
10. The operators have never taken SGTR training through the point of establishing RHR cooling.			

Fact	Date	Time	Source
11. Existing simulator scenarios do not progress through ES 3.1 to the point that a transition to RHR is made.	--	--	Interview of S.Dziadik
12. The conflict between ES-3.1 and SOP 4.2.1 regarding the RCS pressure requirement to enter RHR was not identified during simulator training.	--	--	Interview of S.Dziadik
13. During the plant cooldown and transition onto Residual Heat Removal certain procedural inadequacies were uncovered. SOP 4.1.2 Residual Heat Removal System Operation assumes that the system is being placed into service from a normal, isolated condition. However, this procedure was entered from Emergency Operating Procedure ES 3.1 which is used following a Safety Injection. The Safety Injection opens 822 A & B, Component Cooling to the RHR Heat Exchangers. The procedure should address either starting point and allow for only a single heat exchanger to be lined up to CCW. Later, we secured the only operating Reactor Coolant Pump. This necessitates using Auxilliary Spray from the Charging Pumps for pressure control. It was found that if Aux. Spray is used with a normal Spray Valve partially open, pressure control is ineffective and Surge Line temperature is affected. The procedure (SOP 1.4 Pressurizer Pressure Control)and/or training should address closing all normal spray valves prior to using Aux. Spray to maximize its effectiveness.			CR 200001015
14. Late entry- During the ALERT on 2/16/00 the POM directed that the OPS OSC Coordinator prepare a contingency plan and Procedure to transfer the contents of 24 Steam Generator to the Unit 1 Waste Collection Tank 11. This activity was lead by a Spare FSS with support from NPOs and a Generation Support procedure writer. A TPC and a planned flow path were prepared by the Team and reviewed with the POM. The POM authorized the line up of the equipment required to implement the plan with the exception of three valves to provide an isolation path. The intent was to be prepared to implement a contingency action in case the transfer became necessary to protect the integrity of 24 Steam Generator. The TPC was not SNSC approved at the time of the valve line up contrary to AO-100 and OAD-27. Prior to the actual transfer of 24 Steam Generator, after the ALERT was terminated, the procedure change was approved. Please assign to GS to provide further documentation; assign FYIs to Recovery Plan Manager (John Curry), Emergency Preparedness and NS&L.			CR 20001384

Also, [illegible] action?

G Rev Use of Additional RO. "informal" – Not all information input into official logs.

Contributing Cause 2-2 – Logkeeping

Central Control Room and Emergency Response Organization log-keeping performance during the event was below prevailing industry practices. As a result, event reconstruction was difficult, which interfered with evaluating adequacy of Emergency Response Organization response and support, identifying "lessons to be learned" and developing corrective actions.

The team did not determine whether log keeping met applicable legal requirements.

Log keeping practices during previous EP exercises were reportedly similar to those in this event. Corrective actions for a number of ERO performance weaknesses, including log keeping, had been initiated but not completed prior to this event.

GASPAR LOG not used

Similar weaknesses were noted in the Central Control Room (CCR) log keeping. OAD 3, "Plant Surveillance and Log Keeping" specifies a number of operator actions and evolutions that must be logged. Some of the more significant requirements include plant chemistry and radiological data, significant events which could affect plant operation, and conversations with System Operators.

"Standards and Expectations for Operations Personnel" require narrative logbooks to be chronological, accurate written histories of plant operations that are legal documents that contain an accurate history of plant operations.

Factual Basis:

Fact	Date	Time	Source
1. Archive Operator Log did not include declaration of the ALERT.	2/15/00	1929	Archived Operator Log
2. Archive Operator Log did not include logging notification of ALERT to NRC, State, Local agencies.	2/15/00	2007	Archived Operator Log
3. Control Room Chemistry Log did not include several Boron samples that the Watch Chemist log indicates were reported to the CCR.	2/15/00	many	CCR Chemistry Log, Watch Chemist Log
4. Archive Operator Log did not log start time of first cooldown.	2/15/00	2047	Archived Operator Log, Handwritten Logs
5. Time when first cooldown rate was increased was not logged.	2/15/00	2108	Archived Operator Log
6. Re-establishment of auxiliary feed to 24 S/G at 2024 was not logged.	2/15/00	2024	Archived Operator Log
7. Reason for loss of condenser vacuum was not logged.	2/16/00	0005	Archived Operator Log
8. Start of "Personnel Accountability" was not logged.	2/15/00		Archived Operator Log
9. Initial results of accountability (i.e., not all persons accounted for) were not accurately logged.	2/15/00		Archived Operator Log
10. Emergency Response Organization log keeping performance during this event was consistent with ERP log keeping performance during EP exercises.	2/15-16/00		EP Manager discussion

Fact	Date	Time	Source
11. The EOF did not maintain an Emergency Director Log that documented ED decisions and direction.	2/15-16/00		• Initial EP package of 2/22/00. • Additional EP records on 3/300. • Discussion with EP Manager.
1. The TSC POM Log did not adequately document POM decisions and direction.	2/15-16/00		TSC logs.
2. "Records and logs maintained throughout the emergency are poor."	2/15-16/00		Independent Emergency Planning Event Analysis (rev 2)
3. Log entries re: TSC activation generally implied formal activation at 2059 (when the TSC was 'functional') rather than the formal activation noted in the TSC log at 2220:			
TSC Log entry: "Waited until roster persons arrived before officially activating TSC."	2/15/00	2220	TSC Log
EOF Tech advisor log transcription: "TSC Activated."	2/15/00	2059	EOF Tech advisor log transcription
Repro of TSC Event Chronology: "TSC Activated."	2/15/00	2059	Repro of TSC Event Chronology
TSC POM log: "TSC Activated."	2/15/00	2059	TSC POM log
4. TSC briefed the NRC Regional Office prior to activation: "Conference Call with [NRC Regional Office personnel]"	2/15/00	2035	TSC POM log
"Brief NRC Regional office of plant status"	2/15/00	2122	TSC Log
5. Some Emergency Response Organization Logs inconsistently designated time, generally did not indicate the date on every page:			
TSC log initial entry is "2/15/00 2220"; Second entry (same page) is "9:22"; third entry (following blank page) is "0720 [no date—appears to be 2/16/00]"; at bottom of page, "16:57"; following page, first entry, "9:23" [no date—subsequent entries same page are consistent with morning of 2/16/00]; several pages later, entry time sequence is "...13:36; 1346; 2:04; 2:11; ..."	2/15-16/00	Many	TSC Log
OSC I&C Coordinator log: entry sequence, starting on first page, is "... 2049; 2059; 2110; 10:05; 1150; 1200; 1245; 0415; 0700;..."	2/15-16/00	Many	OSC I&C Log
OSC Team Tracking Logs: Logs are undated; value of entries is not clear.			OSC Team Tracking Logs
TSC Comm Log: First 5 entries were from 11-07-90, crossed out.			TSC Comm Log

Fact	Date	Time	Source
6. The media upon which logs were kept were inconsistent across the ERO. Some logs were maintained in bound log books; some were maintained in spiral notebooks; some were unbound pages. The team was unable to find a "master list" of required logs. It is not possible to determine (after the fact): • if all required logs were maintained throughout the event; • if all logs that were kept were collected for post-event analysis; • if the logs collected after the event include all pages upon which entries were made.	2/15-16/00		Review of ERO logs
7. Information flow between facilities was not clearly and consistently logged in ERO logs; level of log entry detail varied significantly from individual to individual within the same ERO position.	2/15-16/00		ERO Logs
8. Emergency Operations Facility Information Liaison Package consisted of copies of three press releases (including some draft copies); did not include a 'Log'	2/15-16/00		EOF Info Liaison
9. Emergency Facility clocks were not synchronized during the event: clock error re: SAS clock was established after the event.	2/15-16/00		F. Inzirillo input; "Clock Synch Check"
10. Boron control information (i.e., RCS and RHR boron concentration) was not consistently logged in any single ERO log. Boron concentration entries appear in: Archived Operator Log; Central Control Room handwritten log; TSC Log; TSC Event Chronology board (reproduction); TSC POM log; TSC Communicator Log; EOF Tech Advisor log (transcribed); TSC Core Physics Engineer Log Watch Chemistry Log With the exception of the TSC POM log and TSC Communicator log, each of the logs listed above had entries not found in any of the others. Boron concentration entries in the POM and Communicator logs were also entered in other logs.	2/15-16/00	Many	Various Logs
11. Cooldown rate log entries were few. Interviews with watch personnel suggest that cooldown rate was monitored, however this is not reflected in log entries.	2/16/00		EP Log review (incl. Archived operator log)

- Facilities lack desired human engineering attention (layout, design, signage).

Contributing Cause EP-1:

Emergency Preparedness Procedures and the processes with which they interface are impacted by the following weaknesses:

- Insufficient guidance for some situations
- Poor human factors
- Inconsistencies with current practices or equipment

Factual Basis:

Fact	Source
TPC 00-05-EP, and TPC 00-06-EP were written to change IP-1023 and IP-1035 respectively. It is not apparent that the reviews required by 10CFR50.54(q) were performed to ensure there was no decrease in the effectiveness of the Emergency Plan.	CR200001126
Two questions deleted from emergency planning requalification test for Emergency Director (ED) by instructor without approval of EP Manager.	CR200001183
Emergency Planning requalification test EP-IM-01, Test D, dated 8/10/99 incorrectly scored at 79% rather than 75%. Passing grade is 80%.	CR200001186
No one was immediately available to continuously communicate with the NRC. The NRC Response Center stressed the urgency in getting this communications path	CR200001219
Personnel in the TSC/OSC used draft procedures (labeled "For Training Purposes Only") along with existing procedures during the event. The overall opinion is that this enhanced response, however it did cause some confusion at the start of the event whether guidance in the new procedures could be used.	CR200001220
Some requirements of the current Implementing Procedures were a hindrance to ERO operations such as the setting up of Step Off Pads into the TSC/OSC areas. The ERO had a temporary change made to the procedures to remove the step off pads when it became clear that contamination was not a concern later in the event.	CR200001229
Better guidance and aids must be provided to the Technical Advisors (TA) sent to the State and County EOCs. Also need a better method of assigning personnel to these positions and ensuring timely relief of individuals.	CR200001230
Due to a shortage of Security Personnel on shift there was a short time period when the main gate was closed without an officer present to allow ERO members to enter the site. Although the Security Force established controlled the IP2 main gate, the IP3 gate was not controlled for some time. Some of the responders enter through this gate during the event. Security personnel were directing ERO personnel where to go when they entered the site. Some were directed to report directly to their assigned facilities. This caused some confusion in the EOF where personnel are normally assigned to ERO positions.	CR200001233

Fact	Source
Event termination was held up for some time due to a request by senior management to notify offsite Executives prior to termination. These notifications were performed outside the EOF. The integrated plans of Indian Point and the State and Counties already outline methods used to notify executives.	CR200001234
The EOF was deactivated quickly after the termination of the ALERT. Although this is allowed by procedure, the JNC was still activated and called for assistance after most of the staff had already left.	CR200001235
E-Plan, Section 8, Training: Initial Lesson Plans A through BB have not been reviewed and updated to reflect major revisions to the IP and IAP procedures dated 9/1/99. (Raises questions about the way in which procedures are promulgated and reviewed to determine impact on training.)	CR200001240
E-Plan, Section 8, Emergency Plan Training Program Description, Sec. 5: requires annual retraining of individuals qualified for the job functions identified in Fig. 8-1 of the plan using self study modules. Self study modules (27) have not been revised to reflect major revisions of the IPs and IAPs dated 9/1/99. (Raises questions about the way in which procedures are promulgated and reviewed to determine impact on training.)	CR200001241
E-Plan, IAP-9: 5.1.1 says "...if EDDS...operative,...obtain computer printouts of Form 42a, 42b, and 42c...every fifteen minutes" There is no written procedure in IAP-9, associated IP-1021 or any other IP or IAP for obtaining these printouts.	CR200001242
E-Plan, IAP-9: 5.1.1.c says "...if EDDS and dedicated telecopiers are inoperative,...obtain Forms 42a and 42c from the SAS/Proteus Operator". Although there is a procedure (i.e., IP-1021) to obtain this data from the Proteus Terminal in the EOF, there is no comparable IP procedure for the SAS Computer Terminal. Procedures provided in the TSC and EOF for this purpose by Computer Applications are not user friendly and awkward to use and are not referenced for use in any IAP or IP. Data from the SAS is printed white on black. Setting the printer to print black on white will facilitate sending this data by facsimile and could reduce the need for transposing the data as described in IAP-9: 5.1.1.c.2.	CR200001248
E-Plan, Section 7.2, Communication Systems describes the communication systems, however neither the plan, the IAPs nor the IPs describe or provide a comprehensive set of operating instructions for the communication equipment and systems available in the EOF and AEOF for the ED, ORAD, EOF Communicators, and the DAHP to use. E.g.; V-Band Consoles, Positron Consoles, standard radio communication techniques.	CR200001251
Several requests have been made to the Emergency Planning Organization to provide guidance to a newly hired person in the Site Services Procedure Section for the complex distribution of EP procedures and forms. EP had two TPCs last week and they were only distributed to the locations that could be found without guidance.	CR200001257
The procedure distribution process for Emergency Plan Implementing and Immediate Action Procedures is not functioning. Procedure revisions and TPCs are not being distributed to all controlled copies in a timely manner.	CR200001258
Identified as a result of the February 15th event, the ambiguity of what constitutes a release sets the stage for misunderstanding. The release well below Tech. Specs. caused confusion offsite.	CR200001298

Fact	Source
3) The JNC was slow to activate once personnel arrived. No access control was established allowing reporters to roam freely into all areas. 4)The decision was made in the JNC for individual organizations to perform independent briefings with the media. This is different from the agreed upon approach of joint briefings. The issue of whether a radiological release had or had not occurred would have been caught in the JNC had the agreed upon procedures been followed. 5)The JNC is activated using a call-tree. The call tree has only one individual for the majority of positions. If that one person is not contacted, the rest of the tree will not be completed. JNC positions are not part of the site ERO mobilization process. 6)The JNC does not have physical activation procedure.	CR200001300
E-Plan, Book1, IAP-9, Rev. 8: 5.1.1.a Direction to distribute Forms 42a and 42c to the counties and Forms 42a, 42b and 42c to NYS, JNC and NRC (similarly to 5.1.1.b.4 &5) has been omitted.	CR200001320
IAP-1, Rev. 11, ADD. 8.1: Provides direction to the NYS EOC in Albany, NY but provides no directions to the Orange, Putnam, Rockland and Westchester EOCs. IAP-2, Rev.8. Does not include procedure for the TA activities at the State and County EOCs; nor does it provide directions to these EOCs.	CR200001324
IAP-9: 5.1.1.b.4 says for the EOF Clerks to send only Forms 42a and 42c to the Counties; 5.1.1.b.6 says to send Forms 42a, 42b, and 42c to NYS, JNC and the NRC. This distinction between which forms to send to the Counties and which to send to the others requires two separate operations on the facsimile machines which doubles the time for this operation. Eliminate this additional effort by sending Form 42b to the counties as well. With Technical Advisors at each county EOC, these knowledgeable individuals could find this information very useful.	CR200001347
A survey was conducted to solicit Emergency Response Organization comments on emergency response activities during the event. The following knowledge and training deficiencies and observations were made by respondents: • EOF personnel responsible for completing form 30a notification procedures were not aware that for forms generated using MEANS software the event description section is editable and should have been edited subsequent to the initial notification to ensure the current status was being selected. Personnel were confused as to whether responding onsite during the event was considered to fall under the unscheduled work requirements as regards fitness-for-duty. • Some personnel onsite at the time that the accountability alarm was sounded either ignored it or were not sure what to do upon hearing it. • Numerous personnel, upon being beeped or hearing accountability alarm called the CCR to find out if it was a real event. (Procedural guidance should be reviewed to determine the extent to which these deficiencies are procedurally based.)	CR200001361

Fact	Source
A survey was conducted to solicit Emergency Response Organization comments on emergency response activities during the event. The following procedure and guidance deficiencies and observations were made by respondents: No guidance exists to keep site personnel informed (such as use of plant page) of plant and emergency status. Copies of phone numbers for TSC, OSC and EOF are not readily available in the CCR so that calls coming into the CCR can be re-directed to the appropriate locations. Copies of procedures and emergency telephone numbers are not available to the Technical Advisors sent to the counties. The Technical Advisor sent to the counties are not formally proceduralized as part of the implementing procedures.	CR200001362
A survey was conducted to solicit Emergency Response Organization comments on emergency response activities during the event. The following Joint News Center and Media Relations deficiencies and observations were made by respondents: • Insufficient personnel were available to staff the JNC and/or relieve participant for a second shift. • Telephone numbers at the JNC and in the Media Relations Emergency Response Plan were not up to date.	CR200001363 Report in Tab-01
The 6 year requirement to test the off-hours Emergency Drill capability has not been done since 1993. (Emergency Planning Administrative Directives should be reviewed to establish adequacy of processes intended to ensure all Emergency Planning requirements are met.)	CR200001366

Contributing Cause 3-2:

Emergency Response Organization training is not fully effective:

- Not all personnel in Emergency Response Organization positions have completed all required training
- The ERO has insufficient number of trained personnel to support requirements of extended emergency support
- EP drills and exercises have not adequately tested the ERO in all aspects of their responsibilities

Factual Basis:

Fact	Source
Level II staffing was met for emergency response organization mobilization.	CR200001090
Site accountability was not completed within the 30 minute requirement. (Review exercise history to establish how frequently off-hours accountability has been tested.)	CR200001091
The TSC, OSC and EOF were not declared activated within 1 hour of emergency declaration. (Per another CR, off-hour activation has not been tested since 1963; effectiveness of past mobilization exercises should be evaluated.)	CR200001092
Facility logs and documentation standards were not met. Logs were incomplete and poorly kept.	CR200001093
Recovery actions were not initiated in accordance with IP-1048 "Closeout/De-escalation of Emergency and Initiation of Recovery" and IAP-14 "Recovery Manager."	CR200001098
Certain emergency response organization responders were not currently qualified to fulfill their emergency response organization positions. Positions included: Information Liaison, Recovery Manager, and several clerical positions.	CR200001099
E-Plan, Section 8; Training: Initial Lesson Plans A through BB have not been reviewed and updated to reflect major revisions to the IP and IAP procedures dated 9/1/99. (Lesson plans need to be updated, retraining performed as necessary.)	CR200001240
E-Plan, Section 8, Emergency Plan Training Program Description, Sec. 5: requires annual retraining of individuals qualified for the job functions identified in Fig. 8-1 of the plan using self study modules. Self study modules (27) have not been revised to reflect major revisions of the IPs and IAPs dated 9/1/99. (Study modules need to be updated, retraining performed as necessary.)	CR200001241
The callout process for ERO augmentation during off-hours does not have a testing procedure that is designed to test the entire callout process. Pagers are tested monthly but the test does nothing more than test the pager equipment for response. The ERO augmentation time has not been assessed since March of 1993. The CIG callout process is ineffective.	CR200001297

Fact	Source
2) The first responders arrived around 10:00 pm. Con Ed responders who arrived at the JNC set off the building alarm because the code was not entered properly. The police responded. There was a lack of keys available to responders. 3) The JNC was very slow to activate once personnel arrived. No access control was established allowing reporters to roam freely into all areas. 7) There is no formal JNC staff training program. Interviews with county personnel indicate the JNC to be poorly maintained with ambiguous activation and operational requirements.	CR200001300
Failure to conduct an event critique with county and State response personnel immediately after the ALERT was a significant detriment to the count/utility relationship. This was evidenced by counties establishing corrective actions without coordination with the utility.	CR200001301
SAS/Proteus Operators indicated the need for more SAS/Proteus training for both themselves and ERO member users.	CR200001356
A survey was conducted to solicit Emergency Response Organization comments on emergency response activities during the event. The following knowledge and training deficiencies and observations were made by respondents: • EOF personnel responsible for completing form 30a notification procedures were not aware that for forms generated using MEANS software the event description section is editable and should have been edited subsequent to the initial notification to ensure the current status was being selected. Personnel were confused as to whether responding onsite during the event was considered to fall under the unscheduled work requirements as regards fitness-for-duty. • Some personnel onsite at the time that the accountability alarm was sounded either ignored it or were not sure what to do upon hearing it. • Numerous personnel, upon being beeped or hearing accountability alarm called the CCR to find out if it was a real event. (Training plans should be reviewed and revised as necessary to address these deficiencies, including training in response to potential procedural changes that also may respond to some of these issues.)	CR200001361
A survey was conducted to solicit Emergency Response Organization comments on emergency response activities during the event. The following Joint News Center and Media Relations deficiencies and observations were made by respondents: • Insufficient personnel were available to staff the JNC and/or relieve participant for a second shift. • The Assistant JNC Director stated that she had not been adequately trained to respond to inquiries from the media.	CR200001363

Contributing Cause 3-3:

Facilities and Equipment did not fully support ERO needs:

- Facility, reference material, and equipment maintenance/availability were deficient in some respects.
- Facilities lack desired human engineering attention (layout, design, signage)

Factual Basis:

Fact	Source
Site accountability was not completed within the 30 minute requirement. [Reliance on a paper-based, rather than key-card-based system contributed.]	CR200001091
The TSC, OSC and EOF were not declared activated within 1 hour of emergency declaration. [CIG page system problems contributed.]	CR200001092
The Emergency Data Display System (EDDS) and Emergency Response Data System (ERDS) were not functional for the first 5 hours of the event.	CR200001094
The Reuter-Stokes offsite telemetered radiation monitor system did not provide normal display output for the duration of the event.	CR200001095
Reuter-Stokes offsite radiation monitor in sector 2 would not provide data remotely over telephone line due to noise on the line.	CR200001104
The Reuter-Stokes offsite radiation monitoring system availability has not been adequate.	CR200001218
Many of the dedicated phone systems in the OSC/TSC were in the process of being upgraded. This caused some confusion and some of the new systems were not working properly.	CR200001221
ERO members requested more phones in the OSC/TSC complex. Multi-line phones can only be used by one person at a time.	CR200001222
Locating phone numbers for individuals within the Emergency Response Facilities was reported as difficult. The proposed Emergency Telephone Directory must be finalized and distributed.	CR200001223
The addition of several personal computers to the OSC/TSC was a great help to responders. However, systems had not been configured properly to allow access to all required data and additional computers were still needed.	CR200001224
More office supplies should be made available in the Emergency Response Facilities.	CR200001228
There were several minor equipment problems with phones, fax machines, copiers and printers. The ERO called in resources to correct or work around these problems.	CR200001232
... The CIG callout process is ineffective. [CIG page system and/or the way it is being used contributed significantly to mobilization delays.]	CR200001297
2) The first [JNC] responders arrived around 10:00 pm. Con Ed responders who arrived at the JNC set off the building alarm because the code was not entered properly. The police responded. There was a lack of keys available to responders. 7) ... Interviews with county personnel indicate the JNC to be poorly maintained...	CR200001300

Fact	Source
The following equipment and facility deficiencies and observations were made by respondents: • EOF Communicator 2 V-band flash to TSC not functioning. • A survey meter from the field monitoring kit failed. • Missing headsets from TSC. No headset was available for communicators. • TSC fax machines programmed to autodial EOF only. Other necessary locations need to be programmed such as CCR, NRC, Westinghouse, etc. • Numerous telephones in the TSC did not work. • Plant Information System (PI) needs to be loaded onto TSC PCs to allow access during an emergency. • There are exposed telephone and electrical wires in the TSC that should be in conduits or properly controlled to prevent tripping and or damage. • Need several electrical extension cords for the TSC and OSC. Place in equipment lockers and add to inventories. • No calculators were available in the TSC. • Tool room key was only available from Shift Manager.	CR200001357
The following Joint News Center and Media Relations deficiencies and observations were made by respondents: • No link to the Con Ed intranet, e-mail service or LAN exists for Con Ed emergency responders in the JNC. • The JNC HVAC performed poorly resulting in excessive temperatures in the JNC. This required the opening of windows that, due to the proximity of the building to the runway, resulted in excessive background noise and aircraft exhaust in the facility. • Numerous equipment deficiencies were noted including telephones and fax machines. The facility should be inspected for extent of condition.	CR200001363
EP-S-7.301, Rev. 13, Att. 8.5, p.2/2 Four lead bricks found missing from TSC Emergency Locker for 02/15/00 inventory check.	CR200001417
EP-S-7.301, Rev. 13, Att. 8.5, p.2/2 and Att. 8.6, p.1/3 both require 4 lead bricks each in the TSC and the OSC Emergency Lockers. Lead bricks are used to shield the SPA-3 detector as prescribed in IP-1020, Add. 8.3. According to Add. 8.3, 9 to 11 bricks are required to shield the detector. The bricks in the lockers are hazardous material and not packaged for routine handling.	CR200001424
HPN desk set not connected to NRC FTS-2000 phone line 700-861-5158. This line was run across TSC floor and applied to ERDS computer. Line was taped to floor with masking tape. This is a tripping hazard. Using this line in TSC for data circuit disables the HPN extension in the EOF that would be used for voice transmission.	CR200001436