

RAS 1770

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of: : Docket No. 50-423-LA-300 JUN -2 P2:42
: :
Northeast Nuclear Energy Company :
: :
(Millstone Nuclear Power Station, :
Unit No. 3) : ASLBP No. 00-771-01-LA

OFFICE OF THE
ATTORNEY GENERAL
ADJUTANT GENERAL

CONNECTICUT COALITION AGAINST MILLSTONE AND
LONG ISLAND COALITION AGAINST MILLSTONE
SUBMISSION RESPONSIVE TO NRC STAFF'S MOTION TO COMPEL

Pursuant to the order of the Atomic Safety and Licensing Board Panel entered on May 26 on the NRC Staff's Motion to Compel dated May 3, 2000, the Connecticut Coalition Against Millstone ("CCAM") and Long Island Coalition Against Millstone ("CAM") (collectively, the "Intervenors") submit the following:

- (1) Specific Interrogatory N(6): Identify the boron loss event cited on page 100 of the prehearing conference transcript, as to name of plant and site. Specific the cause, the amount of boron lost, the duration of the event, the actions taken and the result. Make specific reference to all documents, records, statements or sources which relate to your answer.

Response: Please refer to attached Preliminary Notification Index I-990996 Millstone 2 and attachments thereto.

- (2) Experts (2): For each expert named in the answer to General Interrogatory 1, state . . . (d) any authorities and/or treatises upon which the expert relies.

Response: Please refer to attachments provided in "Connecticut Coalition Against Millstone and Long Island Coalition Against Millstone Supplemental Response to Northeast Nuclear Energy Company's First Request for Production" dated May 30, 2000. Other authorities may be relied on as the brief preparation develops.

CONNECTICUT COALITION AGAINST MILLSTONE
LONG ISLAND COALITION AGAINST MILLSTONE

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Template = SECY-041

SECY-02

PNO-I-99-006 Millstone 2

[Preliminary Notification index](#) | [News and Information](#) | [Main NRC Home Page](#) | [E-mail](#).

January 29, 1999

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE PNO-I-99-006

This preliminary notification constitutes EARLY notice of events of POSSIBLE safety or public interest significance. The information is as initially received without verification or evaluation, and is basically all that is known by Region I staff in King of Prussia, Pennsylvania on this date.

Facility	Licensee Emergency Classification
Northeast Utilities	Notification of Unusual Event
Millstone 2	Alert
Waterford, Connecticut	Site Area Emergency
Dockets: 50-336	General Emergency
	X Not Applicable

Subject: INADVERTENT TRANSFER OF WATER FROM THE MILLSTONE UNIT 2 SPENT FUEL POOL

On January 28, 1999, operators inadvertently reduced spent fuel pool water level by 2 inches (approximately 2700 gallons) when purification of the spent fuel pool water was initiated. For the previous several days, operators had been using the purification system to drain the refueling cavity inside containment and transfer the water to the liquid radioactive waste system. When the refueling cavity was nearly empty, operators secured the purification system pumps as specified in the purification system operating procedure. This operating procedure directed isolation of the purification system suction path. However, the procedure did not include specific steps to isolate the purification system discharge to the liquid radioactive waste system.

The operators held a shift briefing to discuss realigning the purification system to clean the spent fuel pool water and reviewed the purification system piping diagram. Then, the operators realigned the system to purify the spent fuel pool water using a different section of the purification system operating procedure. This section of the procedure directed the isolation of the flow path from the refueling cavity, as well as opening the suction and return path to the spent fuel pool. Again, the procedure did not include specific steps to isolate the purification system discharge to the clean liquid radioactive waste system.

After the purification system pumps were started, the operators noted unexpected flow to the clean liquid radioactive waste system, and secured the purification system pumps. The operators noted that spent fuel pool water level had decreased and that level still appeared to be decreasing with the purification system pumps secured, so the operators isolated the flow path to the clean liquid radioactive waste system. This action terminated the spent fuel pool level decrease.

Throughout the event, the spent fuel pool water level remained above the spent fuel pool low level alarm setpoint. Had the transfer of water continued with no operator action, passive design features would have ensured that adequate water remained in the spent fuel pool for cooling and shielding of the stored fuel; thus the risk significance of the event

is low.

As a result of this event and a recent similar configuration control event, the licensee has initiated a formal root-cause investigation to identify corrective actions and an operations work stand-down to assess operations department work practices. The spent fuel pool level has been restored to its normal level. The licensee has concluded that this event was not reportable.

The resident inspectors have been following the licensee's response to this event.

The State of Connecticut has been notified.

The Region I Office of Public Affairs is prepared to respond to media inquiries.

The information in this notification is current as of 12:00 noon on January 29, 1998.

Contact: Jacque Durr
(610) 337-5224

Information Search on CR # M2-99-0304

Tuesday, March 28, 2000

CR No: M2-99-0304 APPROXIMATELY 2370 GALLONS OF SFP WATER WAS
TRANSFERRED TO THE CW
SYSTEM

Event Date:	Ops Screen Date:	Signif Level:	CR Status Code:	CR Process Code:	Reportability Code:
01/28/1999	01/28/1999	2	O	R	N

Document Notes:

CONDITION DESCRIPTION While aligning Refuel Purification from the RFP to the SFP, transferred approximately 2370 gallons of SFP water to the CW system. This was due to two valves that were OPEN per OP 2305, Section 4.29.9 and not closed prior to lineup for SFP purification **3/13/99. Significance level changed from 1 to 2. Approved by MDMRT on 2/24/99. J. Carpentier - Organization(s) Responsible. Operations - Responsible for aligning plant systems and review, validation and approval of Ops. procedures. CPG - Responsible for revising Ops. procedures What Happened: During the days preceding this event, Refuel Pool Level had been reduced primarily by diverting a portion of the Shutdown Cooling flow stream to the RWST in accordance with OP 2301E. Draining the RCS (IPTE), in preparation for reactor vessel reassembly. After the reactor vessel head is in place, a substantial amount of water remains in the areas of the refuel pool (the north and south saddles) below the reactor vessel flange. This water is transferred to either the RWST or the Clean Radioactive Waste system using the spent fuel pool purification pumps. The preferred destination is to the RWST as this allows for 100% recovery and re-use of the water. A subsection is provided in the procedure that allows diversion of the water to the Clean Radioactive Waste system if there is insufficient room in the RWST. On several occasions (evolution stopped and started several times to accommodate re-use of water for filling SITs as described below) on 1/25/99 and 1/26/99, water was transferred from the saddles to the RWST with the intent of reducing the level in the saddles to zero. Following the tensioning of the reactor vessel head and during the saddle draining, the following emergent plan to reuse more RFP (saddle) water to fill the SITs was implemented. Water would be transferred until the level in the RWST reached a high value. RWST water would then be transferred to the RCS until an upper RCS level value (+99in) was reached. At this point, water would be transferred to the Safety Injection Tanks to restore SIT level to normal. Once RWST level had been reduced to an acceptable level, water was again transferred to the RWST from the saddles. This was a change in planning to reuse water. Although, its a good idea in one respect, it caused significant additional activity to be managed by the Control Room in an already busy schedule. At 1830 (late in the day shift) on 1/27/99, with the RWST level high, the south saddle was aligned to the Clean Radioactive Waste System and the SFP Purification Pump was started. This alignment opens two in-line valves (2-RW-356 and 2-LRR-424) at the outlet of the purification demineralizer to clean radioactive waste. Shift turnover was completed about an hour later. During the Aux. Bldg. turnover the RFP pump down evolution and flowpath was described verbally. Prints and markups were not used to describe the ongoing evolution. At 2004 with level low in the saddles, the SFP Purification Pump was stopped and the restoration valves closed by procedure. The water level in the saddles at this time were between 1 1/2 and 2 feet. The procedural limit for securing the purification pumps is at 6in to prevent cavitation of the pumps. At this point the PEO was led to believe that the evolution was secured from the RFP through purification line up to Clean Radwaste by the procedure (valves 2-RW-356 and 2-LRR-424 still open). The restoration section (section 4.29 of OP 2305) of the procedure did not provide the necessary guidance to restore the flowpath to clean radwaste through 2-RW-356 and 2-LRR-424. This realignment was also performed by night shift PEOs, as turnover had taken place. Accordingly, there was no real potential for one shift to recognize that the valves they opened earlier were not closed in the restoration section of the procedure. The final drain down evolution of the saddles through the temp. filters was then performed by procedure. This change in configuration was not logged; it was not clear that the US was aware of the plant line up. Between 2004 on 1/27/99 and 0344 on 1/28/99, the Auxiliary Building PEO realigned the portions of the SFP Cooling and Purification system as specified in OP 2305, first bypassing the SFP demineralizer and then aligning SFP Purification to the SFP. When 2-RW-65, Refuel Water Purification System Return to SFP, was opened, (estimated at 0337) water began flowing from the SFP Pump discharge to the Clean Radioactive Waste system. At this point, the fact that inventory was being lost from the SFP was not known to the operations staff. The PEO started the Purification pump at 0344. About 4 minutes later, the PEO adjusted SFP suction flow down from about 1100 gpm to around 1000 gpm, momentarily picking up the low suction flow alarm in the process. 11 minutes after the Purification pump was started, the PEO stopped the pump after observing flow to the Clean Radioactive Waste System. This was an alert discovery by the PEO, in thinking outside the box, as no annunciators or flow alarms alerted to this parameter. The PEO went to the SFP and observed that SFP level had decreased about 2 inches. The control room was notified and the PEO shut 2-RW-16, the Purification Pump suction. A subsequent check of SFP level indicated that inventory was still being lost, as the flow path was still open through 2-RW-65 to the demineralizer outlet and then through 2-RW-356 and 2-LRR-424 to clean radioactive waste. The PEO and the US determined that the path to Clean Radioactive Waste was still open and valve 2-LRR-424 was closed. At this point the loss of SFP inventory was terminated. A total of approximately 2370 gallons was lost from the SFP. There were no releases to the environment as a result of this event. Part of revision 18 to OP 2305, effective 12/15/96, involved merging a separate section for pumping the saddles to clean radwaste with the section for draining the RFP to the RWST via purification. The revision process failed to capture all the restoration steps that would have ensured that the valves to clean radwaste get closed. Additionally, some restoration steps for draining the RFP via the purification system (section 4.29 of OP 2305) could cause a PEO to enter and exit CTMT multiple times unnecessarily. Also noted, is that this section accommodates aligning the RFP drain filter which is for all practical purposes a separate evolution. * The root cause of this event is inadequate work practice during the procedure revision which lead to a deficient procedure that resulted in two valves being opened with no subsequent steps to close the valves as part of a restoration activity. Other procedural deficiencies which complicate subsequent restoration activities exist. Contributing factors involved: * Changing the plan for pumping down the RFP to reuse the water for filling the SITs created emergent work in that multiple evolutions were required. This compounded an already busy work schedule. An abundance of on-going/scheduled and emergent work has distracted SM and US attention from plant evolutions. * A more detailed turnover between the USs and Aux. Bldg PEOs (i.e. the use of prints) may have identified to the oncoming PEO and US, the valves in question. A contributing factor involves starting an evolution in close proximity to shift turnover. A side issue discovered during this investigation involved command and control in communicating and logging changes in plant configuration (i.e. shifting line up from Clean Radwaste to temp. filters) were lacking. This was not a cause of this event. Activity and Process Being Performed: Securing from pumping down the RFP saddles and placing the SFP Cooling System on purification. Why did it Happen (Apparent Cause) Inattention to detail inadequate work practice existed when the last

Information Search on CR # M2-99-0304

Tuesday, March 28, 2000

revision (18) to the SFP Cooling and Purification system procedure was created. This event occurred as a result of procedural inadequacy. The section for draining the RFP saddles was inadequate from a restoration standpoint. The restoration steps failed to isolate the clean radwaste flowpath and another valve. This open flow path set up plant conditions, so, that as soon as 2-RW-65 was opened to align SFP cooling to purification, the SFP level started to lower. This error in the procedure was created when two sections of the procedure were merged during revision 18. When the sections were merged, restoration steps which were included in rev. 17 did not get transferred into the combined section. These steps would have ensured that the clean radwaste discharge path was isolated when securing from draining the saddles. Other procedure inadequacies were noted during this investigation. **CONTRIBUTING CAUSES**
 Cognitive overload on a more global basis at Unit 2 has resulted in inadequate work planning. An abundance of on-going scheduled and emergent work has made the Control Room a busy place, deferring SM and US attention from plant evolutions. Complicating the plan for pumping down the RFP saddles added to this workload. A lack of information validation and verification when turning over the status of the RFP pump down. A more detailed turnover (i.e. the use of prints) may have alerted the night shift US and PEO to the open flowpath and procedure deficiency. - **Corrective Actions** 1. Brief Ops. Department and CPG personnel on the following. a) the results of this investigation, the need for thorough work practices when implementing the procedure change process. b) maintaining a questioning attitude on all procedure driven evolutions. c) using and marking up P&IDs for evolutions. Use them for conducting turnovers, especially during evolutions that are underway. d) maintaining a conservative approach to plant evolutions. Treat each evolution as a problem that needs to be solved verse a job that needs to get done. e) to emphasize sticking to the plan and avoiding changes that would add scope to an already abundant work load. 2. Management presence has been increased in the Control Room as required to perform observations and to deflect issues that distract US attention from plant and SM attention from the big picture on plant evolutions. Added resources have been provided to the shift to support thorough planning and research for all plant evolutions by going to four shift rotation and distributing the extra resources to support the abundance of ongoing work. This includes having outage coordinators rotate shifts with the crews to provide added planning support. 3. The Unit 2 Operations department initiated a Stand-Down on January 27 to allow the management team to evaluate and understand 2 recent events and to determine a corrective action plan that will allow us to proceed with confidence toward MODE 4. The Stand-Down was terminated on Friday, January 29, 1999. 4. Initiate Human Performance Enhancement refresher training for OPS personnel. 5. The DC process (procedure revision, review, validation and verification process) has been improved since this procedure was revised. More focus and organizational changes have been provided to manage the volume of work to produce, validate, review, screen and approve procedures. Multiple coordinators at CPG and an SM have been incorporated into the review process to improve control over the revision and change process. 6. The errant procedure needs to be modified to correct the restoration steps that caused this event and the other procedural discrepancies. Restore restoration steps to OP 2305 which ensures that the clean radwaste flow path isolated and miscellaneous other improvements (see markup). 7. Perform a CR review in 6 months to determine if any issues/events have occurred due to technical errors in procedural guidance.

AR Number:	Assign Nbr:	Assign Subject:	Assign Due Date:	Sched Reference	Mode Code:
99001497	01	M2-99-0304 LEAD: APPROXIMATELY 2370 GALLONS OF SFP WATER WAS	02/20/1999	2DATE	NA

Assign Status: COMPLETE Assign Type: CATI

Responsible Group: 2MGROPS

Assignment Text:

M2-99-0304, Level 1/3

This assignment is given to 2MGROPS as lead;

Evaluate and provide a Root Cause and a Corrective Action plan;

(You are assigned a root cause. It is your responsibility to establish a team. Have your lead contact Bob Enoch (ext 4205). He will assign a mentor for your team. A mentor needs to be assigned early to help with problem description development, scope and determine which root cause method to use in the analysis.)

CONDITION DESCRIPTION:

While aligning Refuel Purification from the RFP to the SFP, transferred approximately 2370 gallons of SFP water to the CW system. This was due to two valves that were OPEN per OP 2305, Section 4.29.9 and not closed prior to lineup for SFP purification.

**3/13/99 Approved by the MOMRT on 2/24/99 to downgrade the significance level of this CR from 1 to 2. J. Carpentier/X4723/2CAO

Information Search on CR # M2-99-0304

Tuesday, March 28, 2000

Assignment Completion Notes:

During the days preceding this event, Refuel Pool Level had been reduced primarily by diverting a portion of Shutdown Cooling flow stream to the RWST in accordance with OP 2301E, Draining the RCS (IPTE), in preparation for reactor vessel reassembly. After the reactor vessel head is in place, a substantial amount of water remains in the areas of the refuel pool (the north and south saddles) <the reactor vessel flange. This water is transferred either the RWST or the Clean Radioactive Waste sys. using the spent fuel pool purification pumps. The preferred destination is to the RWST as this allows for 100% recovery and re-use of the water. A subsection is provided in the procedure that allows diverting of the water to the Clean Radioactive Waste system if there is insufficient room in the RWST. On several occasions (evolution stopped and started several times to accommodate re-use of water for filling SITS) At 1130 (late in the day shift) on 1/27/99, with RWST level high, the south saddle was aligned to the Clean Radioactive Waste System and the SFP Purification Pump started. This alignment opens two in-line valves (2-RW-356 and 2-LRR-424) at the outlet of the purification demin. The procedural limit for securing the purification pumps is at 6" to prevent cavitation of the pumps. At this point the PEO was led to believe that the evolution was secured from the RFP through purification line up to Clean Radwaste by the procedure (valves 2-RW-356 and 2-LRR-424 still open). The restoration section (section 4.29 of OP 2305) of the procedure did not provide the necessary guidance to restore the flowpath to clean rad waste through 2-RW-356 and 2-LRR-424. Between 2004 on 1/27/99 and 0344 on 1/28/99, the Aux Building PEO realigned the portions of the SFP Cooling and Purification system as specified in OP 2305, 1st bypassing SFP demineralizer and then aligning SFP Pur to the SFP. When 2-RW-65, Refuel Water Purification System Return to SFP, was opened, (estimated at 0337) water began flowing from the SFP Pump discharge to the Clean Radioactive Waste system. At this point, the fact that inventory was being lost from the SFP was not known to the operations staff. The PEO started the Pur pump at 0344. About 4 minutes later, the PEO adjusted SFP suction flow down from about 1100 gpm to around 1000 gpm, momentarily picking up the low suction flow alarm in the process. 11 minutes after the Purification pump was started, the PEO stopped the pump observing flow to the Clean Radioactive Waste System. This was an alert discovery by the PEO, in thinking outside the box, as no annunciators or flow alarms alerted to this parameter. The PEO went to the SFP and observed that level had decreased about 2 inches. The control room was notified and the PEO shut 2-RW-16, the Purification Pump suction. A subsequent check of SFP level indicated that inventory was still being lost, as the flow path was still open through 2-RW-65 to the demineralizer outlet and then through 2-RW-356 and 2-LRR-424 to clean radioactive waste. The PEO and the US determined that the path to Clean Radioactive Waste was still open and 2-LRR-424 was closed. At this point the loss of SF inventory was terminated. A total of approximately 2370 gal. was lost from the SFP. There were no release to the environment as a result of this event. Inattention to detail, inadequate work practice existed when the last revision (18) to the SFP Cooling and Purification system procedure was created. Event occurred as a result of procedural inadequacy. The section for draining the RFP saddles was inadequate from a restoration standpoint. The restoration steps did not isolate the clean radwaste flowpath and another valve. This open flow path set up plant conditions, so that as soon as 2-RW-65 was opened to align SFP cooling to purification, the SFP level started to lower. Cognitive overload on a more global basis at Unit 2 has resulted in inadequate work planning. An abundance of on-going scheduled and emergent work has made the Control Room a busy place, deferring SM and US attention from plant evolution's. A lack of information validation and verification when turning over the status of the RFP pump down. A more detailed turnover (i.e. the use of prints) may have alerted the night shift US and PEO to the open flowpath and procedure deficiency. Corrective Actions: a. Corrective Actions to Minimize Causal Factors: Brief Ops. Department and CPG personnel on the following: a) the results of this investigation, the need for thorough work practices when implementing the procedure change process. b) maintaining a questioning attitude on all procedure given evolution's. c) using and marking up P&IDs for evolution's. Use them for conducting turnovers, especially during evolution's that are underway. d) maintaining a conservative approach to plant evolution's. Treat each evolution as a problem that needs to be solved verse a job that needs to get done. e) emphasize sticking to the plan and avoiding changes that add scope to an already abundant work load. 2. The Unit 2 Operations department initiated a Stand-Down, January 27 to allow the management team to eval. and understand 2 recent events and to determine a corrective action plan that will allow us to proceed with confidence to MODE 4. The Stand-Down was terminated on Friday, January 29, 1999. 3. Add management presence to the Control Room to divert issues that distract US attention from plant and SM attention from the big picture on plant evolution's. 4. Provide added resources to the shift to support plan- 5. Provide Human Performance Enhancement refresher training for OPS personnel. 6. The DC process (procedure revision, review, validation and verification process) has been improved since this procedure was revised. 7. Correct human factor deficiencies in OP 2305 to minimize step retrace in performing evolution's; b. Compensatory Corrective Actions: 1. The flow path to clean radwaste was isolated. 2. The SFP level was verified to be in the correct band. Corrective Actions to Prevent recurrence: The errant procedure needs to be revised to correct restoration steps that caused this event. : Monitoring for Effectiveness: Perform a CR review in 6 months to determine if any issues/events have occurred due to inadequate procedural guidance and to determine if any significant technical errors are discovered in procedures

AR Number:	Assign Nbr:	Assign Subject:	Assign Due Date:	Sched Reference	Mode Code:
99001497	02	CR M2-99-0304 Perform a CR review,...	08/20/1999	NA	NA

Assign Status: COMPLETE Assign Type: CATE

Responsible Group: 2MGROPS

Assignment Text:

3/24/99 Effectiveness monitoring assignment for CR M2-99-0304 to Hagan, due 8/20/99
 Perform a CR review in 6 months to determine if any issues/events have occurred due to technical errors in procedural guidance. Issue
 feaser x5206 U2CAD

Information Search on CR # M2-99-0304

Tuesday, March 28, 2000

Assignment Completion Notes:

The purpose of this corrective action is to perform an effectiveness review for similar CRs six months after the event. The goal was to determine if issues or events had occurred due to technical errors in procedures. Although, several CRs were generated for procedural discrepancies, no errors or events were attributed to technical errors in procedures. The conclusion of this effectiveness review is that no adverse trend exists.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNR

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of: : Docket No. 50-423-LA-3 JUN -2 P2:42
: :
Northeast Nuclear Energy Company : :
: :
(Millstone Nuclear Power Station, : :
Unit No. 3) : ASLBP No. 00-771-01-LA

CERTIFICATE OF SERVICE

I hereby certify that copies of "Connecticut Coalition Against Millstone and Long Island Coalition Against Millstone Submission Responsive to the NRC Staff's Motion to Compel" and the documents identified therein in the above-captioned proceeding have been served on the following by deposit in the United States Mail, first class, this 30th day of May, 2000, and transmitted by telefax to Ann P. Hodgdon, as follows:

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