Dominion Nuclear Connecticut, Inc.
Millstone Power Station
Rope Ferry Road
Waterford, CT 06385

Dominion

NOV 21 2003

Docket No. 50-336
B19010

RE: 10 CFR 50.73(a)(2)(v)(B)

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Millstone Power Station, Unit No. 2
Licensee Event Report 2003-005-00
Loss of Shutdown Cooling During Refueling Outage

This letter forwards Licensee Event Report (LER) 2003-005-00, documenting an event that occurred at Millstone Unit No. 2, on October 14, 2003. This LER is being submitted pursuant to 10 CFR 50.73(a)(2)(v)(B).

There are no regulatory commitments contained within this letter.

Should you have any questions regarding this submittal, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

DOMINION NUCLEAR CONNECTICUT, INC.

Stephen P. Sarver, Director
Nuclear Station Operations and Maintenance

Attachment (1): LER 2003-005-00

cc: H. J. Miller, Region I Administrator
R. B. Ennis, NRC Senior Project Manager, Millstone Unit No. 2
Millstone Senior Resident Inspector

IE22

Docket No. 50-336
B19010

Attachment 1

Millstone Power Station, Unit No. 2

LER 2003-005-00

NRC FORM 366 (7-2001) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104 EXPIRES 7-31-2004

Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Millstone Power Station - Unit No. 2	05000336	1 OF 3

TITLE (4)

Loss of Shutdown Cooling as a Result of Switching Inverter Power Supplies

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MO	DAY	YEAR	FACILITY NAME	DOCKET NUMBER 05000
10	14	2003	2003	- 005 -	00	11	21	2003	FACILITY NAME	DOCKET NUMBER 05000

		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply) (11)							
OPERATING MODE (9)	5		20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
POWER LEVEL (10)	0		20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
			20.2203(a)(1)		50.36(c)(1)(i)(A)		50.73(a)(2)(iv)(A)		73.71(a)(4)
			20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
			20.2203(a)(2)(ii)		50.36(c)(2)	X	50.73(a)(2)(v)(B)		OTHER
			20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		Specify in Abstract below or
			20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		In NRC Form 366A
			20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)		
			20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
			20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
David W. Dodson, Supervisor Nuclear Station Licensing.	860-447-1791

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
☐	YES (If yes, complete EXPECTED SUBMISSION DATE).	☒ NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On October 14, 2003, at 0407 with the plant in Mode 5, a loss of shutdown cooling (SDC) occurred when the SDC heat exchanger flow control valve (FCV) failed closed due to a loss of power at vital 120 vac panel VA10. When the FCV closed, the SDC heat exchangers were bypassed and resulted in a reactor coolant temperature rise of approximately 14 degrees F. The loss of SDC is reportable as a loss of safety function in accordance with 10CFR50.73(a)(2)(v)(B). In addition, as expected upon a loss of VA10, one of the containment radiation monitors sent a signal to close the containment purge valves. Contrary to the normal response, the purge valves did not close and the operators manually closed them from the control room as directed by procedure. This unanticipated plant response did not complicate the event and is not reportable as the containment purge isolation function is not required in Mode 5. Operator action restored power to VA10 within 13 minutes causing the FCV to automatically open and reestablish cooling. The plant declared an Unusual Event (UE) at 0423 (Event Number 40245) when reactor coolant temperature rise exceeded 10 degrees F and subsequently terminated the UE at 0532 after stabilizing plant conditions

The root cause of the event was determined to be a procedure deficiency resulting from using an incorrect version of the vendor technical manual. The operations procedure allows switch manipulations that momentarily parallel two energized inverters without synchronous protection.

The corrective actions to prevent recurrence are to modify the operations procedure, vendor manual, and associated training documents to reflect safe operation of the inverter and static switch.

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Millstone Power Station - Unit No. 2	05000336	2003	- 005 -	00	2 OF 3

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

1. Event Description

On October 14, 2003, at 0407 with the plant in Mode 5, a loss of shutdown cooling (SDC) occurred when the SDC [BP] heat exchanger flow control valve (FCV) [FCV] failed closed due to a loss of power at vital 120 vac panel VA10. When the FCV closed, the SDC heat exchangers were bypassed and resulted in a reactor coolant temperature rise of approximately 14 degrees F. The loss of SDC is reportable as a loss of safety function in accordance with 10CFR50.73(a)(2)(v)(B). In addition, as expected upon a loss of VA10, one of the containment radiation monitors sent a signal to close the containment purge valves. Contrary to the normal response, the purge valves did not close and the operators manually closed them from the control room as directed by procedure. This unanticipated plant response did not complicate the event and is not reportable as the containment purge isolation function is not required in Mode 5. Operator action restored power to VA10 within 13 minutes causing the FCV to automatically open and reestablish cooling. The plant declared an Unusual Event (UE) at 0423 (Event Number 40245) when reactor coolant temperature rise exceeded 10 degrees F and subsequently terminated the UE at 0532 after stabilizing plant conditions.

At the time of the event, the unit was in day 4 of a scheduled refueling outage and the following conditions existed:

- two SDC trains were operable, one train was in operation
- reactor coolant system (RCS) was vented through the pressurizer manway and filled to approximately 27%
- RCS temperature was 101 degrees F
- containment personnel and equipment hatches were open and containment closure teams were in place
- both emergency diesel generators were available, 3 out of 4 vital 120 vac panels were available
- two high pressure safety injection pumps and two charging pumps were available

A recent change in the method of performing inverter [INVT] maintenance required the use of an existing design configuration that was subsequently determined, as a result of this first-time evolution, to have a limitation. Specifically, the circuits for the vital inverter contain manual bypass and static switches, which when used as directed in the approved operations procedure allow the momentary paralleling of two asynchronous power sources. The procedure instructions reflect equally inaccurate vendor instructions provided with an earlier version of the vendor technical manual. The vendor manual had been subsequently corrected to compensate for the design limitation and was available at the time of equipment installation (1992). However, the testing and procedure reviews performed at the time of equipment installation did not uncover the procedure deficiency and it became a latent procedure error.

2. Cause

The root cause of the event was determined to be a procedure deficiency resulting from using an incorrect version of the vendor technical manual. Specifically, the operations procedure allows switch manipulations that momentarily parallel two energized inverters without synchronous protection.

3. Assessment of Safety Consequences

There were no significant safety consequences as a result of the loss of SDC. Operators are routinely trained on the emergency and abnormal operating procedures related to a loss of vital ac power and manual restoration of SDC. Operations personnel had been successfully dispatched to await instruction to manually open the FCV to reestablish cooling and to close containment. These actions were not required since the FCV automatically reopened when vital power was restored to VA10 through its alternate supply. It is important to note that although the SDC heat exchanger was bypassed during this event, the SDC pump continued to operate and supply flow to the reactor coolant system (RCS). In addition, the estimated time to boil was approximately 1.3 hours based on

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
Millstone Power Station - Unit No. 2	05000336	2003	- 005 -	00	3 OF 3

NARRATIVE *(If more space is required, use additional copies of NRC Form 366A)* **(17)**

the event heat-up rate and core uncovery in this instance was estimated to occur 8.5 hours after boiling. This is considered to be sufficient time to both diagnose and mitigate the event. Also, the charging and high pressure safety injection systems were available to provide makeup to the RCS in the event of boiling. The overall safety significance of this event is considered to be low.

4. Corrective Action

The compensatory corrective action to ensure inverters are returned to Operations in a deenergized state has been implemented. This action allows the existing procedure to be performed as written with the intended result of successfully swapping power supplies for VA10.

The corrective actions to prevent recurrence are to modify the operations procedure, vendor manual, and associated training documents to reflect safe operation of the inverter and static switch.

A root cause investigation was performed and additional corrective actions are being addressed in accordance with the Millstone Corrective Action Program.

5. Previous Occurrences

No previous similar events were identified.

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].