NORTHEAST UTILITIES
The Connecticut Light And Power Company
Western Massachusetts Electric Company
Holyoke Water Power Company
Northeast Utilities Service Company
Northeast Nuclear Energy Company

General Offices · Selden Street, Berlin Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203)665-5000

October 29, 1992
MP-92-1159

Re: 10CFR50.73(a)(2)(i)
10CFR50.73(a)(2)(vii)

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Reference: Facility Operating License No. NPF-49
Docket No. 50-423
Licensee Event Report 92-022-00

Gentlemen:

This letter forwards Licensee Event Report 92-022-00 required to be submitted within thirty (30) days pursuant to 10CFR50.73(a)(2)(i) and 10CFR50.73(a)(2)(vii).

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

FOR: Stephen E. Scace
Vice President - Millstone Station

BY: Harry F. Haynes
Millstone Unit 1 Director

SES/JSY:tp

Attachment: LER 92-022-00

cc: T. T. Martin, Region I Administrator
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2 and 3
V. L. Rooney, NRC Project Manager, Millstone Unit No. 3

03:114

P 702 504 025

IE22
1/1

NRC Form 366 (6-89) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

Estimated burden per response to comply with this information collection request: 50.0 hrs. Forward comments regarding burden estimate to the Records and Reports Management Branch (p-530), U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Millstone Nuclear Power Station Unit 3	0 5 0 0 0 4 2 3	1 OF 0 8

TITLE (4): Both Trains of Supplemental Leak Collection and Release System Inoperable

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	
0 9	2 9	9 2	9 2	- 0 2 2	- 0 0	1 0	2 9	9 2		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): 1

POWER LEVEL (10): 1 0 0

THIS REPORT IS BEING SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
20.405(a)(1)(i)	50.36(c)(1)	50.73(a)(2)(v)	73.71(c)
20.405(a)(1)(ii)	50.36(c)(2)	X 50.73(a)(2)(vii)	OTHER (Specify in Abstract below and in Text, NRC Form 366A)
20.405(a)(1)(iii)	X 50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	
20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER AREA CODE
Jeffrey S. Young (Ext. 4557)	2 0 3 4 4 7 - 1 7 9 1

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

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On September 29, 1992, at 1247 with the plant in Mode 1 at 100% power, unit management determined that the "B" train of the Supplemental Leak Collection and Release System (SLCRS) was inoperable and that insufficient surveillance testing existed to prove the operability of the "A" train. The Control Room staff was directed to enter Limiting Condition for Operation (LCO) 3.0.3. The discovery was made during review of an In Service Test (IST) which had been performed on September 26. Based on allowance of LCO 4.0.3, another IST was performed on the "A" train to determine its operability.

Subsequently, on September 29, 1992, at 2347 with the plant in Mode 1 at 100% power, the Control Room staff determined that the "A" train of the SLCRS was also inoperable. Immediate corrective action was to begin a plant shutdown at 0036 on September 30. The shutdown was completed on October 1, 1992 at 0814 when the unit entered Mode 5.

There are three root cause to the problems with SLCRS and Auxiliary Building Ventilation System (ABVS). First, incomplete system design coupled with several specific equipment problems. Second, inadequate surveillance test procedures were used. Third, the design basis and operating parameters of the Auxiliary Building Filter (ABF) system and its interaction with the SLCRS was not fully understood.

To prevent recurrence, the following actions are being taken:

a thorough review of the design and construction of the ABVS has been performed and appropriate changes have been made.

surveillance test procedure will be revised

a system engineer concept is being implemented. This will enhance the ability to identify emerging or pre-existing problems.

an upgrade of procedures is being conducted. This process will ensure that procedures address the relationship between basis documents and testing.

1. Description of Event

On September 29, 1992, at 1247 with the plant in Mode 1 at 100% power (2250 psia and 586 degrees Fahrenheit) the "B" train of the SLCRS was declared inoperable and the surveillance testing of the "A" train was determined to be inadequate to prove operability. The test review committee discovered the condition while reviewing results of an IST performed on September 26. The Control Room staff was informed and directed to enter LCO 3.0.3.

The immediate corrective action was to perform another IST to meet the surveillance requirements of the "A" train of SLCRS.

While performing this IST on September 29, 1992, at 2347 with the plant in Mode 1 at 100% power (2250 psia and 587 degrees Fahrenheit) the "A" train of the SLCRS failed to draw down the secondary enclosure within the required 50 second time frame and was declared inoperable by the Control Room staff. The Control Room staff began a shutdown of the unit on September 30 at 0036.

The following sequence of events is provided to give a summary of all action taken to resolve SLCRS and ABVS problems. Licensee Event Reports 92-016 and 92-020 reported conditions that could have prevented the SLCRS and ABVS from performing their intended functions. For clarity, the events are described together.

The Auxiliary Building Ventilation System (ABVS) is a two train system serving three purposes: cooling equipment in the auxiliary building, filtration prior to atmospheric release during an accident, and assistance in establishing and maintaining vacuum in the auxiliary building.

During normal operation, the ABVS draws air from the outside atmosphere with Fan 14 (A or B), distributes air to the charging pump cubicles, component cooling water heat exchanger area, and the MCC/rod control booster pump area, and exhausts the warm air to the auxiliary building vent stack with Fan 13 (A or B). Temperature indication controllers maintain temperatures by modulating supply and recirculation dampers.

During the accident mode, the ABVS isolates the normal exhaust path, routes the air flow through a plenum and into the filters using Fan 6 (A or B), and exhausts it through the auxiliary building vent stack. During the accident mode, an SIS starts the exhaust Fan 6A; if Fan 6A fails to start, a logic sequence starts Fan 6B. The temperature indicating controllers continue to maintain area temperatures. Pressure indicating controllers, located in the plenum on the inlet side of the filtration exhaust fans, maintains building pressure by modulating variable inlet vanes (VIV) at the inlet to the filtration exhaust fans.

During the accident mode, the Supplementary Leak Collection and Release System (SLCRS) draws a vacuum on the Auxiliary Building, the Engineered Safeguards Features Building, the Main Steam Valve Building, the Hydrogen Recombiner Building, and the Enclosure Building, and exhausts air to the atmosphere through the site stack. The SLCRS system is a two train filtration system with an independent duct system.

Prior to commercial operation, NNECO determined that ABF exhaust fans and their associated VIVs would not automatically operate due to various concerns such as fan cycling, system pressure fluctuations, and fan instability. Outstanding Design Deficiency Report (DDR) No. 1028 was initiated on February 25, 1986 to evaluate "system logic or equipment changes required to permit automatic operation" of the fans. As a temporary measure to establish initial operability, the DDR indicated that the VIVs would be set at the 20 percent open position (and not in automatic mode). The DDR indicated further that there was no generic issue and no immediate safety concern regarding the deficiency.

This DDR was among approximately 13,000 startup issues identified by Stone and Webster Engineering Company (SWEC). Prior to startup, this backlog of issues was reduced to about 6,000 (which included some combining of items), and by 1988 the number was reduced to about 400. In 1988, a new tracking system was established to capture the outstanding startup issues. The original DDR was recategorized as plant modification request (PMR) No. PMR3-88-026 and consolidated as a project assignment (PA) with a number of auxiliary building HVAC design deficiencies for disposition.

The original DDR and subsequent reviews of this issue focused on general ventilation deficiencies. NNECO did not recognize the system interaction issues that ultimately led to the August 24, 1992 determination that the ABF system was inoperable (LER 92-020). During this time, the periodic integrated surveillance testing, although determined after-the-fact to be in error, continually indicated that the system was performing properly and thus was operable. Given this information, and that the overall projected costs of eliminating all the ventilation related concerns were high, NNECO believed there was no need for urgency in dispositioning the PMR on a priority basis.

The sequence of events leading to the subsequent discovery of the inoperable system, the full scope of the design and equipment problems and the testing inadequacy, and the subsequent plant shutdown was as follows. This sequence demonstrates that what was involved was a complex technical issue which emerged over several months as various pieces in the engineering puzzle became available in July to September 1992. NNECO believes that at each point in time it acted reasonably based on information then available, and that its inquiries (which accelerated as the issue evolved) were at all times commensurate with the real time perception of safety significance.

On May 19, 1992, an In Service Test (IST) 3-92-014 was performed which tested SLCRS and the ABF system in accordance with the existing surveillance procedure. This test was performed to respond to a LER 92-003 commitment to resolve an unrelated SLCRS seal deficiency. (This was not an operability IST. It was intended to show that prior boundary breach would not impact drawdown capability.)

On July 4, 1992, NNECO declared both trains of the ABF system inoperable when a plenum access door was found open (LER 92-016). NNECO formed a task force to investigate this matter.

Between July 7, 1992 and July 11, 1992, NNECO's task force was evaluating two separate issues related to the above two incidents: a) the effect of a hole in the ABF system ductwork and b) a breach in the SLCRS boundary. (The two events were covered by LERs 92-003 and 92-016.) During the task force investigation NNECO identified that the VIVs to the ABF system filter exhaust fans were manually set at 20 percent open and not in automatic mode. Further investigation revealed that the VIVs had been set at this position since commercial operation (as discussed above). In addition, NNECO discovered that during surveillances, the VIVs had historically, by procedure, been placed in automatic mode. Plant Engineering began an inquiry into why the system had not always been left in the design configuration (automatic).

During their investigation, Engineering determined that start-up and design engineers had placed the VIVs in manual due to fan instability and cycling problems during start-up testing. Instability could cause long term operability concerns. NNECO also determined that the 20 percent open VIV position may not have been conservative for SLCRS drawdown during summer conditions and started exploring alternative VIV positions.

On July 11, 1992, NNECO placed the VIVs in a 100 percent open position under Bypass Jumper 3-92-030. This was intended to improve drawdown capability and address summer conditions. The primary basis for this action was that the ABF system had satisfactorily completed six years of monthly surveillances for filter system flow rate with the VIVs going to 100 percent open in the automatic mode. These data caused NNECO to believe that the 100 percent open position was conservative and would provide continued operability of the system. This action was also consistent with earlier recommendations from the system designers (SWEC and NUSCO) to use 20 percent open VIVs for winter conditions and 100 percent open for summer. (This was based on a joint SWEC/NUSCO testing effort.)

On August 12, 1992, while performing further system reviews to address the outstanding issues on the SLCRS boundary breach, NNECO determined that the prior monthly flow surveillance tests had been conducted with a ventilation fan (Fan 7) supplying air to the filter system plenum. This would not be available during an accident. The monthly flow surveillance test was satisfactory to meet the test objective. However, once this factor was clearly understood, NNECO identified the need to run another test because previous technical assessments assumed that Fan 7 would not be running. At the time NNECO was still attempting to gather data to respond to LER 92-003 on SLCRS breach. Therefore, NNECO determined to address this factor in an additional IST.

Since NNECO had observed on many occasions during prior summers the ABF system operating satisfactorily with the VIVs set at 100 percent open, and since the initial design review indicated that 100 percent should be the proper position, there was at the time still reasonable assurance that the IST would be successful. Consequently, the next IST was not scheduled until August 24, 1992, and the system was considered operable (based on existing evidence).

On August 24, 1992, NNECO performed the IST (IST 3-92-017). During the test it was determined that, with the VIVs set at 100 percent open and the auxiliary building temperature indicating controller manually positioned at 100 percent output (i.e., closed), the ABF system fans would trip due to low suction pressure. NNECO entered Technical Specification 3.0.3 and declared both trains of the ABF system inoperable for about two hours. Subsequent testing the same day established ABF system operability with train "A" VIV at 50 percent open and train "B" VIV at 20 percent open (the known summer configuration). In addition, a SLCRS drawdown test was performed using the existing surveillance method.

NNECO promptly notified NRC pursuant to 10 C.F.R. § 50.72(b)(2)(iii) on August 24. NNECO filed LER 92-020 on September 23, 1992 in accordance with 10 C.F.R. § 50.73. A task force to investigate the root cause of this matter was immediately established and the task force members met for the first time on August 31, 1992.

Between August 31 and September 28, 1992, NNECO's task force conducted system inspections and performed system testing to obtain system data. NNECO prepared an IST to review fan operability and acquire flow data so that a permanent solution to the VIV problem could be developed. The IST was performed between September 26-28, 1992.

On September 29, 1992, while reviewing the IST data and control circuitry, NNECO determined that Train "B" of SLCRS was inoperable and that the IST had not provided assurance of Train "A" operability. Specifically, timing delays in the fan circuitry resulted in a 70-75 second delay in fan start from signal actuation. In addition, NNECO determined that the timing sequence difference between an actual accident configuration and the existing SLCRS drawdown surveillance was enough to consider the surveillance inadequate for verifying system operability. The plant entered Technical Specification 3.0.3.

Subsequently, another IST on Train "A" was conducted to determine its operability. Train "A" was determined to be inoperable and plant shutdown began. (The IST results showed that the .25 inch negative pressure criteria could not be met in 60 seconds (80 seconds actual).) Shutdown was completed on October 1, 1992.

NNECO's goal throughout this evaluation process has been for the ABF system and SLCRS to achieve three objectives: a) SLCRS drawdown within 50 seconds, b) reliable fan operation, c) operation with no operator action (i.e., automatic mode) and d) operation in compliance with the single failure criterion. These are the goals that NNECO was attempting to prove in testing and to achieve in subsequent design changes.

A manual shutdown of the unit was required and initiated on September 30 at 0036 and was completed on October 1 at 0815 when the unit entered Mode 5.

II. Cause of Event

The ABF system was inoperable between July 11 and August 24, 1992, and at other undetermined times subsequent to plant startup (based on ambient conditions, positioning of dampers, etc.). NNECO has determined that this condition resulted from an incomplete system design coupled with several specific equipment problems.

The ABF system and equipment deficiencies relate to the following performance objectives:

- the ability to assist SLCRS drawdown within 50 seconds of emergency diesel generator breaker close;
- the ability to operate automatically (previously, the VIV's were set at 20% in manual mode);
- the reliability of fan operation;
- maintaining compliance with the single failure criterion.

The drawdown surveillance test procedure performed on the system subsequent to plant startup until the shutdown in September/October 1992 to address the problem was inadequate. The test (i.e., in accident mode configuration) did not ensure that the ABF system and SLCRS could achieve a negative 0.25 inch water gauge pressure within 50 seconds inside the secondary enclosure building (as currently required by Technical Specifications) and also it did not address the temperature control system.

The root cause for the operability issue and the test issue discussed above was raised in the NRC IR: since initial startup, NNECO was not fully aware of the Auxiliary Building Filtration system design basis and operating parameters, and the ABF system's interaction with SLCRS. This factor contributed to the inadequacy of the integrated test procedure to adequately test the system, and to the failure to recognize and address system operability.

NNECO acknowledges this factor, but believes that it must be viewed in proper context, i.e., the overall complexity of the system design and the technical issues involved. As discussed above, this issue emerged gradually given that surveillances had been successful and indications of the problem developed sequentially. In addition, it is very important to recognize that the design of these two systems and the problems involved, are highly unique. They do not indicate a likelihood of other similar problems.

During the investigation of this event, several common mode failure issues were identified. First, the Charging Pump and Component Cooling Water Area Ventilation supply and exhaust fans were not interlocked to prevent both supply fans from running if only one exhaust fan was running. Second, under some conditions failure of a filter fan could not be detected which prevented the standby train from starting.

III. Analysis of Event

This event was the subject of an immediate report in accordance with 10CFR50.72(b)(1)(i), as initiation of a plant shutdown required by the plant's Technical Specifications (TS). This report is being submitted in accordance with 10CFR50.73(a)(2)(i)(B), as a condition prohibited by TS and 10CFR50.73(a)(2)(i)(A), for the completion on a plant shutdown required by TS. During investigation of this event, several common mode failure issues were identified which are reportable under 10CFR50.73(a)(2)(vii).

NNECO has determined that the SLCRS in conjunction with the ABF system was inoperable because it could not have drawn down a negative 0.25 inches within 50 seconds in the secondary enclosure building as required by Technical Specifications. There were no actual safety consequences of this condition. While the system conditions from startup to July 1992 were clearly not optimal, potential safety significance was limited because potential releases would be minimized as follows:

- Using conservative DBA assumptions, a delay in the drawdown of the auxiliary building by SCLRS to a negative 0.25 inch vacuum to a time of up to two minutes would result in an unfiltered release that would remain below 10 CFR Part 100 dose limits -- i.e., using Regulatory Guide 1.109 dose factors, a thyroid dose of 286 rem.
- If the same conditions are assumed, but ICRP 30 dose factors are applied, then the thyroid dose would be 180 rem.
- Furthermore, under the guidance of NUREG-1465, a significant release of fission products due to fuel failure is not expected for at least 30 minutes. NNECO's tests show that a negative 0.25 inch vacuum could be established well within this time period.
- Finally, under realistic accident conditions, even though there may be a time delay to reach the negative 0.25 inch vacuum, the auxiliary building would still have a negative pressure and, thus, nearly all releases that might occur in that time period would be filtered. Moreover, in an accident situation, operators are required by normal operating procedures to verify the ESF status panels which include indication of the ABF system fans. Thus, any problems would be addressed in about five minutes.

In sum, given the conservatisms inherent in the design and analysis, the potential safety consequences of the condition were generally low. However, NNECO recognizes that the inoperability of the system between July 11 and August 24, 1992 may have had greater potential safety consequences under the specific circumstances that existed during that time interval. On August 24, in performing the IST on the system with the VIVs repositioned at 100 percent open and the auxiliary building temperature indicating controller closed, both ABF exhaust fans tripped. If this had occurred during accident conditions (after airborne activity had entered the building), without an automatic trip of the supply fans, the charging pump and plant component cooling water pump and heat exchanger area ventilation fans would have continued to run. Since the air would no longer be exhausted through the ABF, the secondary enclosure would have eventually been pressurized resulting in ground level unfiltered releases (in the event of an accident). LER 92-016 and LER 92-020 both reported the condition which resulted in a potential failure to mitigate the consequences of an accident.

IV. Corrective Action

The immediate corrective action for the first event was to perform an IST to determine the operability of the "A" train of the SLCRS.

The immediate corrective action for the second event was to perform a normal plant shutdown.

To correct the incomplete system design and equipment problems, NNECO identified several necessary design and equipment modifications. The following modifications are being made to establish system operability:

- The VIV controls are being corrected to provide steady control of inlet plenum pressure.
- To address the drawdown capability, the sequencer logic is being adjusted so that Fans 6A and 6B will start at an appropriate time.
- The filter fan transfer logic is being modified by replacing the differential pressure switch with the plenum pressure in conjunction with the filter inlet damper position.

- Reliable fan operation is being addressed by assuring a minimum flow path to prevent Fan 6 operation in the fan stall region. This is being achieved by blocking open the supply path and adding low temperature alarms in the control room. In addition, NNECO is installing a means of heating supply air below certain ambient temperatures.
- To address the single failure criterion, the building inlet supply damper is being blocked open to allow minimum required flow for cooling the equipment. The filter inlet damper was blocked open to provide a flow path to prevent operation of the exhaust fan (Fan 13) without an exhaust path.
- Electrical interlocks are being installed to prevent two supply fans (Fan 14A and B) operating with one exhaust fan operation (Fan 13) which would pressurize the building.

As an initial corrective action for the testing deficiency, NNECO prepared an IST to test the redesigned system. As a longer term action, the surveillance procedure will be revised.

To prevent recurrence of the inadequate understanding of system design and interaction between systems, the following actions are being taken as part of the Performance Enhancement Program (PEP).

NNECO will be developing and implementing measures to enhance its engineering capabilities in this area. PEP Action Plan item 2.3.4 involves adoption of a system engineer concept. The system engineer will have responsibility for overall system performance and for a thorough understanding of the design. This will enhance NNECO's ability to identify emerging or pre-existing problems.

A long term procedure upgrade effort will be made. PEP Action Plan item 2.3.5 involves a general upgrade of all procedures over the next several years. A specific element of the plan is an effort to address the basis documents for procedures and generate a basis section in all procedures. If other test procedure problems exist similar to this problem, they will be corrected as part of the procedure upgrade effort. NNECO believes this effort will also enhance knowledge of system design bases.

V. Additional Information

Licensee Event Reports (LER) submitted which discuss events where both trains of either Auxiliary Building Filter System or SLCRS were out of service are as follows:

LER Number	Title
92-020	Both Trains of Auxiliary Building Filter System Inoperable
92-016	Both Trains of Auxiliary Building Filter System Inoperable
91-018	Both Supplemental Leak Collection and Release System Trains Inoperable due to Design Deficiency
91-017	Both Supplemental Leak Collection and Release System Trains Inoperable due to Design Deficiency
91-015	Both Supplemental Leak Collection and Release System Trains Inoperable due to Deficient Procedure
90-010	Auxiliary Building Ventilation Filters Inoperable due to Equipment Failure
89-020	Inadvertent Supplemental Leak Collection and Release System Breach due to Deficient Procedure

TEXT (If more space is required, use additional NRC Form 366A's) (17)

LER 92-020 discusses an event where both trains of the Auxiliary Building Filter System were inoperable from July 11 to August 24. The VIVs had been manually set to 100% open which caused both filter fans to trip. The root cause was failure to perform adequate technical and safety evaluation of a change. The corrective action was to review the event with individuals responsible for performing technical and safety evaluations and incorporate the event in training.

LER 92-016 discusses an event where both trains of the Auxiliary Building Filter System were inoperable due to an open access door on the system's common intake plenum. The root cause was design deficiency which allowed the door to vibrate open. The corrective action was to have the access door lock wired shut.

LER 91-018 discusses an event where both trains of the SLCRS were unknowingly inoperable when the fusible link for a fire damper in each train was subject to high temperature during a loss of non-vital power. The root cause was design deficiency which allowed the fusible links to be exposed to steam during a loss of non-vital power.

LER 91-017 discusses a planned event where both trains of the SLCRS were intentionally rendered inoperable in order to repair a fire damper which had failed shut. This decision was made by management because there was no way to isolate the two SLCRS trains on the discharge header.

LER 91-015 discusses an event where both trains of the SLCRS were inadvertently made inoperable while troubleshooting a fire damper that had failed shut. The root cause was procedural deficiency which did not indicate the impact of removing an access panel on the common discharge plenum of the SLCRS.

LER 90-010 discusses an event where both trains of the Auxiliary Building Filter System were inoperable due to an equipment failure of the "B" train while the "A" train was out of service for maintenance.

LER 89-020 discusses an event where the SLCRS boundary was inadvertently breached when maintenance was performed on a steam relief valve. The root cause was an administrative deficiency which failed to identify the impact of the maintenance on the SLCRS boundary.

Each of the listed LERs is included because either the Auxiliary Building Filter System or SLCRS were rendered inoperable. Except for the LER 92-020, none were caused by inadequate understanding of the Auxiliary Building Filter system and its interaction with the SLCRS. Therefore, the corrective action for these LERs could not have prevented the current event. Since adequate understanding of these systems was not gained until after the shutdown on October 1, the corrective action for LER 92-020 could not have prevented the current event either.