

NON-PUBLIC?: N
ACCESSION #: 9503060001
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Millstone Nuclear Power Station Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000336

TITLE: Charcoal Filter Iodine Removal Efficiency Failure
Associated With Enclosure Building Filtration and Control
Room Air Conditioning
EVENT DATE: 12/30/94 LER #: 94-043-01 REPORT DATE: 02/23/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: * POWER LEVEL: 0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(v)

LICENSEE CONTACT FOR THIS LER:
NAME: Phillip J. Lutzi, Nuclear Licensing TELEPHONE: (203) 440-2072

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: BH COMPONENT: ADS MANUFACTURER: 0000
X VI ADS 0000
REPORTABLE NPRDS: N
N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On December 2, 1994, with the plant defueled, charcoal samples from both the Facility 1 and Facility 2 Enclosure Building Filtration System were sent to an independent laboratory to be analyzed for Iodine removal efficiency. The laboratory test report, which identified unsatisfactory results was reported to the utility on December 30, 1994. In a similar event on December 17, 1994, with the plant defueled, charcoal samples for the Facility 1 Control Room emergency filtration system were sent to the same laboratory to be analyzed for its Iodine removal efficiency. The laboratory test report which identified unsatisfactory results was reported to the utility on January 9, 1995. Previously, in April of 1994, samples from these filtration systems had been tested with

satisfactory results.

The root cause of the Enclosure Building Filtration system charcoal efficiency reduction has been attributed to exposure to cleaning and painting chemicals.

END OF ABSTRACT

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I. Description vent

On December 2, 1994, with the plant defueled, charcoal samples from both the Facility 1 and Facility 2 Enclosure Building Filtration System were sent to an independent laboratory to be analyzed for Iodine removal efficiency. The laboratory test report which identified unsatisfactory results was reported to the utility on December 30, 1994. In a similar event, on December 17, 1994, with the plant defueled, charcoal samples for the Facility 1 Control Room emergency filtration system were sent to the same laboratory to be analyzed for its Iodine removal efficiency. The laboratory test report which identified unsatisfactory results was reported to the utility on January 9, 1995.

The results of the laboratory testing are depicted in the following chart. The Technical Specification limit for charcoal efficiency is 95%. The test used to determine the efficiency of the Charcoal Adsorbers is ASTM D3803-1989, which is the most stringent and rigorous test for charcoal efficiency. Charcoal was tested to this standard in April when Millstone Unit 2 submitted a Technical Specifications change, approving the use of this ASTM standard.

Table omitted.

A review of the charcoal laboratory results had led to additional questions pertaining to the sampling effectiveness as it relates to charcoal bed representation. Additional samples from within the Facility 1 EBFS charcoal housing were removed and analyzed to determine comparative sampling efficiencies. The results from the test canister testing were 82.04 and 83.37 percent efficiency. The results of four random samples taken from within the charcoal bed itself when tested were 89.15, 88.99, 89.04, and 88.84 percent efficiency. These results identified that the charcoal bed efficiency was actually better than the test canister results. This is believed to be a result of insufficient charcoal depth in the test canisters. The procedure for filling canisters has been

corrected to provide specific test canister filling guidance. It should be noted that although these tests did not produce the same results, they did prove that the canister testing produced conservative sample results.

To determine what may have caused the charcoal to fail, an independent laboratory was requested to perform a Gas Chromatography/Mass Spectrometry analysis to identify organic chemicals that had adhered to the charcoal.

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The results of the analysis on the Facility 1 EBFS indicated high concentrations of Min Spirits, Trichloroethane, Xylene, and Toluene. These compounds are prevalent in solvents, degreasers and thinners. Other cleaning compounds were identified in smaller traces.

The design basis of the Enclosure Building Filtration System (EBFS) is to collect leakage from the Containment structure during a Loss of Coolant Accident (LOCA), and process the leakage through the charcoal system to minimize the public's exposure to Iodine and maintain the off site dose less than 10CFR100 limits.

The design basis of the Control Room Emergency Filtration System (CREFS) is to protect the operators from a release originating from any of the three on site units. The basis for this requirement is to protect the operators from iodine exposure so that they may function to place Millstone Unit 2 in a safe and stable condition without putting the operators at risk, either physically or mentally. Radiation protection is provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the duration of the accident.

Following the discovery of this condition in the EBFS on December 30, 1994, the Enclosure Building and Auxiliary Building charcoal filtration systems were declared inoperable. All fuel movement in the spent fuel pool was terminated and will resume when the charcoal adsorber beds are declared operable.

Following the discovery of the condition of the Facility 1 Control Room Filtration System on January 9, 1995, the Facility 1 Control Room Emergency Filtration system was declared inoperable.

The Facility 2 EBFS was changed out in December as part of a routine

changeout recommended by the System Engineer as a result of his review of the April test results. Therefore, with new charcoal installed, the Facility 2 EBFS is considered operable with respect to charcoal efficiency. Batch test results are available for the charcoal installed in the Facility 2 EBFS.

As a result of the charcoal degradation evident in the other three filtration units, an evaluation of the charcoal in stock was performed. It was determined that a more durable and longer life charcoal is preferred to provide better performance than what is currently in use. Type CNN-816 coconut shell charcoal with 5 percent TEDA impregnation was chosen to replace the type 717 charcoal presently on site for Millstone Unit 2. This charcoal was supplied to Millstone Unit 2 by NCS Corp. at a batch efficiency Of 99.75% when tested in accordance with the ASTM D3803-1979 testing standard (30 degrees C & 95/% R.H.). This charcoal has been installed in the Facility 1 EBFS and Facility 1 & 2 Control Room Emergency Filtration system. Since the Facility 2 EBFS was recently changed with type 717 charcoal at a 98.9% efficiency, it will stay in service unless future testing results dictate a change.

There were no automatic or manually initiated safety systems, actuated as a result of the event.

II. Cause of Event

The root cause of the event has been determined to be the use of solvents and paints in the Enclosure Building and the Spent Fuel Pool region. As a result of using a more rigorous testing standard (D3803-1989) which was implemented in 1994, minor flaws that did not show up in the past are now readily apparent. Additionally, the type 717 charcoal that is in stock is greater than 5 years old and does not have the durability of the now type charcoal nor the life expectancy of new charcoal. These items together resulted in accelerated failures of the charcoal.

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III. Analysis of Event

Based on event investigation, this event is reportable under the criteria of 10CFR50.73(a)(2)(v), "Any event or condition that alone could have prevented the fulfillment of the safety function of structures or systems that are needed to: (c) Control the release of radioactive material" and (d) "Mitigate the consequences of an accident."

The Radiological Assessment branch performed an evaluation to determine the effects of this condition. Their analysis was based upon a major accident assuming a substantial meltdown of the core with subsequent release of appreciable quantities of fission products as identified in 10CFR100 and concluded that the off site dose would not have exceeded 10CFR100 limits.

The Control Room Emergency Filtration charcoal efficiency is assumed to be 90%, however, the Technical Specifications are more conservatively set at 95% efficiency. The reported efficiency of 91.54% is above the efficiency assumed by the Radiological assessment branch. Therefore, the affect on the operators would be negligible

IV. Corrective Action

A new improved type charcoal CNN-816 with 5% TEDA impregnation has been installed in the Facility 1 EBFS and Facility 1 & 2 Control room Emergency Filtration system at Millstone Unit 2. This charcoal replaces the type 717 charcoal previously used. Procedural controls for the use of chemicals within the Enclosure Building and Spent Fuel Pool region will be implemented prior to startup.

V. Additional Information

Similar LERs: None

EIIS Codes

Enclosure Building Filtration BH-FLT

Enclosure Building Adsorber BH-ADS

Control Room Filtration VI-FLT

Control Room Adsorber VI-ADS

ATTACHMENT TO 9503060001 PAGE 1 OF 1

Northeast Rope Ferry Rd. (Route 156), Waterford 06385
Nuclear Energy Millstone Nuclear Power Station
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385-0128
(203) 444-4300

Fax (203) 444-4277

The Northeast Utilities System

Donald B. Miller Jr.,
Senior Vice President - Millstone

Re: 10CFR50.73(a)(2)(v)

February 23, 1995
MP-95-066

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

Reference: Facility Operating License No. DPR-65
Docket No. 50-336
Licensee Event Report 94-043-01

This letter forwards update Licensee Event Report 94-043-01.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Donald B. Miller, Jr.
Senior Vice President - Millstone Station

DBM/PHB:ljs

Attachment: LER 94-043-01

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

*** END OF DOCUMENT ***
