



Northern States Power Company

Monticello Nuclear Generating Plant
2807 West County Road 75
Monticello, MN 55362

March 22, 2000

10 CFR Part 50
Section 50.73

US Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT

Docket No. 50-263 License No. DPR-22

LER 2000-005

**Design Deficiency Results In Secondary Containment Leakage
Pathway Which Bypasses Standby Gas Treatment System Filters**

The Licensee Event Report for this occurrence is attached. This report contains no new NRC commitments.

Contact David Musolf, Consulting Production Engineer, at (763) 295-1201 if you require further information.

Byron Day
Plant Manager
Monticello Nuclear Generating Plant

c: Regional Administrator - III NRC
NRR Project Manager, NRC

Sr Resident Inspector, NRC
Minnesota Department of Commerce

Attachment

IE22

NRC FORM 366 (6-1998)		U.S. NUCLEAR REGULATORY COMMISSION			APPROVED BY OMB NO. 3150-0104 EXPIRES 06/30/2001 Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to the industry. Forward comments regarding burden estimate to the Records Management Branch(T-6 F33), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, and to the Paperwork Reduction Project (3150-0104), Office of Management and Budget, Washington, DC 20503. If an 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) MONTICELLO NUCLEAR GENERATING PLANT				DOCKET NUMBER (2) 05000 - 263		PAGE (3) 1 OF 4				
TITLE (4) Design Deficiency Results In Secondary Containment Leakage Pathway Which Bypasses Standby Gas Treatment System Filters										
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 NAME	DOCKET NUMBER
02	23	00	00	-- 005	-- 00	03	22	00		05000
OPERATING MODE (9)		N	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
POWER LEVEL (10)		000	20.2201(b)			20.2203(a)(2)(v)			50.73(a)(2)(i)	50.73(a)(2)(viii)
			20.2203(a)(1)			20.2203(a)(3)(I)		X	50.73(a)(2)(ii)	50.73(a)(2)(x)
			20.2203(a)(2)(i)			20.2203(a)(3)(ii)			50.73(a)(2)(iii)	73.71
			20.2203(a)(2)(ii)			20.2203(a)(4)			50.73(a)(2)(iv)	OTHER
			20.2203(a)(2)(iii)			50.36(c)(1)			50.73(a)(2)(v)	Specify in Abstract below or in NRC Form 366A
			20.2203(a)(2)(iv)			50.36(c)(2)			50.73(a)(2)(vii)	
LICENSEE CONTACT FOR THIS LER (12)										
NAME David Musolf					TELEPHONE NUMBER (Include Area Code) 763-295-1201					
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)										
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
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 15 single-spaced typewritten lines) (16)

During the 2000 refueling outage, special tests were performed to determine the capability of the Standby Gas Treatment System (SBGT) to maintain an adequate vacuum in Secondary Containment (SCT) under various postulated conditions. During testing on 2/21/2000, the SBGT Room was found to be at a lower pressure than the Reactor Building. With the SBGT Room negative with respect to SCT, some air could be drawn into the room from SCT during a design basis loss of coolant accident (LOCA). This air would bypass the SBGT filters before being released from the plant stack. The result would be an increase in calculated LOCA radiation doses in the Control Room and offsite. Calculated doses, however, would remain a small fraction of 10 CFR 50, Appendix A, General Design Criterion 19 and 10 CFR Part 100 guidelines. It was determined that a less restrictive path for air supplied to the SBGT Room was required. A modification was completed, prior to startup from the 2000 refueling outage, to improve the air supply to the SBGT room under SCT isolation conditions which corrected this condition.

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

Description

During the 2000 refueling outage, special tests were scheduled to investigate the effect of various postulated door, fan, and damper configurations on the capability of the Standby Gas Treatment¹ System (SBGT) to maintain an adequate vacuum in Secondary Containment² (SCT).

During the special testing on 2/21/2000, incidental to other measurements being made, the SBGT Room was observed to be at a lower pressure than the Reactor Building. The SBGT Room is not part of SCT and is entered through a set of double air lock doors. With the SBGT Room negative with respect to SCT, some air could be drawn into the room from the SCT during a design basis loss of coolant accident (LOCA). Air could then be drawn from the room into the operating and non-operating fans along their shafts. Since the fans are located downstream of the SBGT filter trains³, this creates the potential for airborne radioactive material in the SCT to bypass the SBGT filters before being released from the Offgas Stack⁴.

Following evaluation of data from the special test program, the SBGT was declared inoperable and the Nuclear Regulatory Commission was notified in accordance with 10 CFR 50.72 at 1800 on 2/23/2000.

Event Analysis

Analysis of Reportability

The potential for leakage from SCT into the SBGT Room under accident conditions is reportable under 10 CFR 50.73(a)(2)(ii). It represents a condition that is outside of the design basis of the plant.

The design basis of the plant provides for collection by the SCT of all leakage from the primary containment structure. By design, contaminated SCT air is then filtered by the SBGT and released from the Offgas Stack. With the SBGT Room at a negative pressure with respect to the SCT, a fraction of the contaminated air in the SCT can bypass the SBGT charcoal adsorbers and high efficiency particulate filters before being released from the stack.

¹ EIS System Code: BH
² EIS System Code: BD
³ EIS Component Code: FLT
⁴ EIS System Code: VL

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Although the performance of SCT and SBTG was degraded, these systems would have performed their safety function and the event is not reportable in accordance with 10 CFR 50.73(a)(2)(v).

Safety Significance

A conservative analysis of the impact of this condition on postulated design basis LOCA Control Room and offsite radiation doses is summarized below. This analysis indicates that, while this condition results in an increase in calculated LOCA doses, doses remain well below 10 CFR 50, Appendix A, General Design Criterion (GDC) 19, and 10 CFR Part 100 guidelines. Therefore, this condition would not preclude either SCT or the SBTG from satisfying their safety functions.

Bypass of the SBTG filter trains due to a negative pressure in the SBTG Room with respect to SCT will increase the amount of postulated iodine released during a LOCA and increase Control Room and offsite thyroid doses. Whole body doses will not be significantly affected.

A conservative estimate of leakage from SCT into the SBTG room, based on the best available information, is 125 cfm. The current LOCA radiation dose analyses, contained in Section 14.7.2.4 of the Monticello USAR, assumes 85% iodine removal efficiency for the SBTG charcoal adsorber. SBTG flow is specified as 3500 cfm ± 10%. Using these parameters, the effect of leakage into SBTG room can be conservatively determined by assuming the stack release thyroid doses will increase by a factor of 1.26.

The impact of this increase on Control Room (CR), Exclusion Area Boundary (EAB), and Low Population Zone (LPZ) LOCA thyroid dose is:

Location	Stack Contribution (Rem)		Total Dose Including Turbine Building Contribution (Rem)		Regulatory Guideline (Rem)
	Current USAR Value	With 125 cfm Leakage	Current USAR Value	With 125 cfm Leakage	
CR	3.00	3.78	13.45	14.2	30
EAB	4.81	6.06	4.81	6.06	300
LPZ	4.44	5.59	11.46	12.6	300

LOCA doses remain well below 10 CFR 50, Appendix A, GDC 19, and 10 CFR Part 100 guidelines. This condition, therefore, has limited safety significance.

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Cause

Investigation of this condition concluded that an undersized SBGT Room makeup air duct, associated air mixing box, and back draft damper presented an unacceptably high pressure drop in the supply air pathway.

This deficiency may have existed since the plant began operation. Modifications made to the SCT and SBGT since plant startup have successively improved their performance, allowing lower pressures to be achieved in the Reactor Building with SCT isolated. It is believed that these progressive improvements in SBGT performance, along with improved testing methods, made it possible to discern the inadequate SBGT Room air supply during the 2000 refueling outage.

Corrective Actions

Prior to restart from the 2000 refueling outage, the Turbine Building supply back draft damper and air mixing box were removed and two additional 8-inch diameter penetrations were core drilled in the wall between the SBGT room and the Turbine Building.

Testing was performed to verify the SBGT Room air supply is now fully adequate to maintain the SBGT room at a positive pressure with respect to secondary containment under design basis (i. e. calm) wind conditions.

Calculations indicate that the additional flow area provided by the new wall openings, combined with the unrestricted flow from the original 6-inch Turbine Building penetration, can supply several times the necessary SBGT Room makeup flow with the SBGT Room positive with respect to the SCT.

Other locations in the Reactor Building outside of SCT were assessed to determine if a condition similar to that discovered in the SBGT Room existed. All locations were found to be at a positive pressure with respect to SCT under SCT isolation conditions.

Failed Component Identification

Not applicable.

Similar Events

None