September 17, 2001

Mr. J. Forbes
Site Vice-President
Monticello Nuclear Generating Plant
Nuclear Management Company, LLC
2807 West County Road 75
Monticello, MN 55362-9637

SUBJECT: MONTICELLO NUCLEAR GENERATING PLANT
NRC INSPECTION REPORT 50-263/01-15(DRS)

Dear Mr. Forbes:

On August 3, 2001, the NRC completed an inspection at the Monticello Nuclear Generating Plant. The enclosed report documents the inspection findings which were discussed on August 3, 2001, with you and members of your staff.

This inspection was an examination of activities conducted under your license as they related to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. Specifically, the inspection focused on the design and performance capability of the Residual Heat Removal and safety related Service Water Systems to ensure the systems were capable of performing required safety related functions.

Based on the results of the inspection, one issue of very low safety significance (Green) was identified. This issue was determined to involve a violation of NRC requirements. Because of the very low safety significance of this violation and because the problem was entered into the corrective action program, the NRC is treating this issue as a Non-Cited Violation, in accordance with Section VI.A.1 of the NRC's Enforcement Policy.

If you contest the Non-Cited Violation, you should provide a response to this letter with the basis for your denial or concern, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, Attn: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Monticello Nuclear Generating Plant.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records System (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA by Acting For/

Ronald N. Gardner, Chief
Electrical Engineering Branch
Division of Reactor Safety

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

Enclosure: Inspection Report 50-263/01-15(DRS);

cc w/encl: J. Purkis, Plant Manager
R. Anderson, Executive Vice President
and Chief Nuclear Officer
Nuclear Asset Manager
Site Licensing Manager
Commissioner, Minnesota Department of Health
J. Silberg, Esquire
Shaw, Pittman, Potts, and Trowbridge
R. Nelson, President
Minnesota Environmental Control Citizens
Association (MECCA)
Commissioner, Minnesota Pollution Control Agency
D. Gruber, Auditor/Treasurer
Wright County Government Center
Commissioner, Minnesota Department of Commerce
A. Neblett, Assistant Attorney General:

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U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-263
License No:	DPR-22
Report No:	50-263/01-15(DRS)
Licensee:	Nuclear Management Company, LLC
Facility:	Monticello Nuclear Generating Plant
Location:	2807 West Highway 75 Monticello, MN 55362
Dates:	July 16 through August 3, 2001
Inspectors:	H. Walker, Team Leader A. Dunlop, Reactor Inspector D. Schrum, Reactor Inspector S. Sheldon, Reactor Inspector R. Winter, Reactor Inspector D. Prevatte, Reactor Inspector (contractor) T. Fong, Inspector Trainee
Approved by:	Ronald N. Gardner, Chief Electrical Engineering Branch Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000263-01-15(DRS), on 07/16 - 08/03/2001, Nuclear Management Company, LLC. Monticello Nuclear Generating Plant. Safety System Design and Performance Capability inspection report.

This report covers a baseline inspection by five regional inspectors and a consultant, that focused on the design and performance capability of the residual heat removal and the safety-related service water systems to ensure that the systems were capable of performing required safety functions. One Green finding was identified. The Green finding involved a Non-Cited Violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using the NRC Inspection Manual Chapter 609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at **http://www/nrc.gov/NRR/OVERSIGHT/INDEX.HTML**. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violations.

A. Inspector Identified Findings

Cornerstone: Mitigating System

- Green. A Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for the failure to include actions in operating procedures to ensure that design basis requirements were not exceeded. Design calculation CA-97-157, indicated that the residual heat removal (RHR) pump rooms would exceed the environmental qualification (EQ) design basis temperature limit of 140 degrees Fahrenheit for the RHR pumps following a loss of coolant accident (LOCA) if two RHR pumps continued to run more than 25.7 hours. There was no operating procedure requiring the shutdown of one pump prior to exceeding the 25.7 hour limit. (Section 1R21.b.1)

  The finding was greater than minor because, if left uncorrected, it could have resulted in the failure of safety related equipment in the RHR corner rooms. The finding was of very low safety significance because the issue did not represent an actual loss of a safety function and there were no identified occurrences where equipment in either RHR corner room had failed as a result of high temperatures. Further, the established environmental qualification (EQ) limits provided a generalized description of the correlation between thermal exposure and degrading of equipment over time and equipment failures could not be assumed for short-term transient temperatures higher than 140 degrees.

B. Licensee Identified Findings

No findings of significance were identified.

Report Details

Summary of Plant Status

The plant operated at or near 100 percent power throughout the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R21 Safety System Design and Performance Capability

Introduction

Inspection of safety system design and performance verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected system to perform design bases functions. As plants age, the design bases may be lost and important design features may be altered or disabled. The plant risk assessment model is based on the capability of the as-built safety system to perform the intended safety functions successfully. This inspectable area will verify aspects of the mitigating systems and barrier integrity cornerstones for which there are no indicators to measure performance.

The objective of the safety system design and performance capability inspection was to assess the adequacy of calculations, analyses, other engineering documents, and operational and testing practices that were used to support the performance of the residual heat removal (RHR) and the safety-related service water systems during normal, abnormal, and accident conditions. The inspection was performed by a team of inspectors that consisted of a team leader, four Region III inspectors, and a consultant. In addition, an NRC inspector trainee also accompanied the inspection team.

The RHR and the safety-related service water systems were selected for review during this inspection. This selection was based upon:

- having a high probabilistic risk analysis ranking;
- having had recent significant modifications; and
- not having received recent NRC review.

The criteria used to determine the system's performance included:

- applicable technical specifications;
- applicable USAR sections;
- licensee responses and commitments to generic communications; and
- the systems design documents.

a. Inspection Scope

The following system and component attributes were reviewed in detail:

System Needs

Process Medium - water
Energy Source - electrical power
Control Systems - initiation, control, and shutdown actions
Operator Actions - initiation, monitoring, control, and shutdown

System Condition and Capability

Installed Configuration - elevation and flow path operation
Design - calculations and procedures
Testing - flowrate, pressure, temperature, voltage, and current

Components

Three components were selected for detailed review during the inspection. The chosen components were the RHR pumps, the residual heat removal service water (RHRSW) pumps and the RHR heat exchanger. The following attributes were reviewed for these components:

Component Degradation
Equipment/Environmental Qualification - temperature (pumps)
Vibration (pumps)
Equipment Protection - flood, missile and freezing (pumps)
Component Inputs and Outputs
Industry Operating Experience

b. Findings

.1 No Operating Procedure for Control of Temperature Limits in the RHR Pump Rooms

The team determined that plant operating procedures did not include actions to ensure that the design basis RHR pump room temperature limit of 140 degrees Farenheit would not be exceeded following a design basis event. During the review of Calculation CA-97-157 “RHR Room Temp Response to General Electric Letters GLN 97-017 and GLN 97-01," June 13, 1997, the inspectors noted that the calculation results indicated that the RHR pump rooms could exceed the 140-degree Fahrenheit temperature limit, specified in Section 6.2.2.2.2.1 of the USAR, 25.7 hours after a loss of coolant accident (LOCA) if all three pumps in a pump room continued to operate. A bounding evaluation, performed by licensee personnel for power uprate, determined that the RHR room coolers would maintain the room temperature below the 140-degree temperature limit provided that long-term emergency core cooling systems pump operation was restricted to the operation of no more than two pumps in each of the pump rooms. Based on discussions with licensee personnel and a review of applicable operating procedures, the inspectors determined that prior to August 3, 2001, no existing operating procedure required the shutdown of one of the RHR pumps following a LOCA before the 140-degree temperature limit could be reached.

The finding was considered more than minor because, if left uncorrected, the condition could result in equipment failures in both RHR corner rooms after a LOCA due to excessive temperatures. Therefore, this finding could have a credible impact on the function of mitigating systems. An additional contributor to the significance of this issue was an emergency operating procedure, which stated that all available torus cooling was to be started to maintain torus water temperature below 90 degrees Fahrenheit without cautions or instructions relating to pump room temperatures. Even though equipment failures can not be assumed for high short-term transient temperatures, there was no assurance that plant operators would secure one of the RHR pumps before the temperature limit could be exceeded and equipment failures occurred.

The finding was found to be of very low safety significance (GREEN) using the SDP analysis to determine the safety significance of the event because no LOCA had occurred, there were no identified occurrences where equipment in either RHR corner room had failed as a result of high temperatures, no actual loss of safety system function had occurred, and mitigating systems remained operable.

The failure to incorporate this design basis temperature requirement, as determined by Calculation CA-97-157, into controlling procedures was a violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," which requires, in part, that measures be established to assure that the applicable regulatory requirements and design basis information are correctly translated into specifications, drawings, procedures, and instructions. Due to the low safety significance of this finding and because Condition Report (CR) 20014512 was written to enter the issue into the corrective action program, this is a Non-Cited Violation (NCV 50-263/2001-15-01 (DRS)) in accordance with Section VI.A.1, of the NRC Enforcement Policy.

.2 <u>Non-Conservative RHR Service Water Pump Acceptance Criteria</u>

Section 4.5.C.1 of the Technical Specification (TS) stated that the minimum acceptable design basis performance for the RHRSW pumps was 3,500 gallons per minute against a 500-foot head (217 pounds per square inch differential pressure (dp) developed head), and this requirement was reflected in the acceptance criteria of surveillance test procedure 0255-05-IA-1, Rev 42, "RHR Service Water Pump and Valve Tests." This level of performance should have been capable of meeting the Section 6.2.3.2.4 USAR requirement that "When the RHRSW pumps are operating the pressure on the tube side of the heat exchanger is maintained at 20 psid above the pressure on the shell side with a dp controlled valve in order to prevent reactor water leakage into the RHRSW system and thereby into the river."

Calculation CA-97-041, Revision 0, "RHR Heat Exchanger Differential Pressure Requirements" was prepared to determine the RHRSW system pressure required to maintain the 20 psi differential pressure at the RHR heat exchangers assuming design basis accident LOCA conditions. The following non-conservatisms were identified in this calculation:

- Licensee personnel determined that the analyses had been based on "nominal" system operating conditions rather than design basis conditions.

- Rather than using minimum TS allowable RHRSW pump performance, the calculation was based on the latest surveillance test data, which reflected current pump performance, that was significantly better than the TS minimum.

- The test data was not adjusted for the design basis low river level of 899'-0".

- The test data was not adjusted for design basis RHRSW strainer loading.

- The test data was not adjusted for maximum aged pipe roughness.

Licensee personnel also discovered that the dp component of the TS criteria had originally been 550-ft. of head but in 1972 was reduced to the current 500-ft. value without adequate analytical bases. This 1972 change to the TS had been approved by the NRC.

To address this issue, licensee personnel initiated CRs 20014456 and 20014483 and promptly began new analyses to address immediate operability issues and to correct the TS acceptance criteria value. Although these analyses were still in the preliminary stage at the completion of the inspection, initial indications were that, for design basis conditions, had the pumps been allowed to degrade to the TS dp limit, they would have been able to provide only 3.5 pounds per square inch differential pressure at the RHR heat exchanger. This assessment was made without taking the 17 psig test instrumentation uncertainty into consideration. With test instrumentation uncertainty considered, the current TS RHRSW pump dp value was non-conservative and inadequate to demonstrate that design basis conditions were met or verify that any positive heat exchanger dp would be maintained.

The licensee's response also addressed actual pump performance for the last 30 tests performed since March, 1999 with respect to the preliminary new analyses. Again, without considering instrument uncertainty, for the most recent tests, all four pumps would have been capable of providing the required 20 pounds per square inch heat exchanger dp under design basis conditions. However, five of the previous tests during this period, all on pump number 13, would have failed to meet the 20 pounds per square inch differential pressure requirement (the worst case would have provided only 17.6 psid). When instrument uncertainty was considered, none of the 30 tests would have met the 20 pounds per square inch differential pressure requirement. However, in all cases, some level of positive dp would have been provided at the heat exchanger for design basis conditions. Additionally, actual river levels and strainer differential pressures that existed at the times would have made up for much of these negative factors. Therefore, it appeared that during this period the pumps would have been operable, but in a degraded condition from the full design basis requirements. Pending final operability determination and resolution of the revised TS pump performance acceptance criteria, this is an Unresolved Item (URI 50-263/2001015-02 (DRS)).

.3 <u>Review of Potential Water Hammer in the RHRSW System (URI 50-263/00-08-01)</u>

The inspectors reviewed actions taken to eliminate or reduce the potential for water hammer in the RHRSW system. This matter had been identified by the NRC in a previous inspection and was documented as an unresolved item 50-263/00-08-01. CR 20003535 had been previously written to document the issue and enter the issue in the corrective action program.

The initial concern prompting this evaluation involved a design basis LOCA where system voiding might occur due to water leakage out of the system during the ten minutes between the beginning of the event and operator action to start the RHRSW pumps. During this period, no credit could be taken for the normally-operating keep-fill system which was non-safety related and powered from a non-1E power source. Any void thus created had the potential to cause a water hammer on starting of the RHRSW pumps.

Although the evaluation appeared to have adequately analyzed the events that were addressed and demonstrated very low potential for water hammer for these events, the inspectors noted additional actions that appeared to be necessary to complete resolution of the problem. The issue was discussed with cognizant licensee personnel who agreed with the additional actions. The actions will be tracked by previously written CR 20003535. Since these additional actions had not been completed, URI 50-263/00-08-01 will remain open until the actions have been completed and review by the NRC has been completed.

4. OTHER ACTIVITIES (OA)

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a selected sample of CRs, associated with the selected systems, to verify an appropriate threshold for identifying issues and to verify the adequacy of corrective actions for the identified issues. In addition, CRs written on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system.

b. Findings

No findings of significance were identified.

40A6 Meetings

Exit Meeting

The inspectors presented the inspection results to Mr. J. Morris and other members of licensee management and staff at the conclusion of the inspection on August 3, 2001. The inspectors noted that some documents, provided early in the inspection, were identified as proprietary and would be treated appropriately. The licensee acknowledged the information discussed during the exit and agreed that no additional proprietary information was discussed or provided.

KEY POINTS OF CONTACT

<u>Licensee</u>
J. Morris, Site Vice President
R. Anderson, RHR System Engineer
Matt Anthony, Superintendent Safety Systems
P. Burke, Superintendent Support Systems Engineering
M. Coyle, Director Plant Support
D. Fadel, Director Engineering
J. Forbes, Plant Manager
J. Grubb, General Superintendent Engineering
S. Hammer, Manager, Projects Group
S. Ludders, Principle Operations Specialist
J. Purkis, Plant Management
S. Sharp, RHRSW System Engineer
A. Ward, Manager Engineering Assessment
L. Wilkerson, Manager System Engineering
D. Zercher, Superintendent Civil/Mechanical Design

<u>NRC</u>
S. Burton, Senior Resident Inspector
R. Gardner, Chief Electrical Engineering Branch

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

Two items were opened by the NRC during this inspection. One item, NCV #50-263/2001015-01 (DRS), was opened and closed during this inspection. In addition, unresolved item (URI 50-263/2001015-02 (DRS), was opened during this inspection.

Closed

No items, identified during previous NRC inspections, were closed during this inspection. One item, NCV # 50-263/2001015-01 (DRS), was opened and closed during this inspection.

Discussed

One item, Unresolved Item 50-263/00-08-01, identified during a previous NRC inspection, was reviewed and discussed during this inspection but was not closed. See Section 1R21. b. 3 of this report.

LIST OF ACRONYMS USED

CR	Condition Report
DBA	Design Bases Accident
dp	differential pressure
ECCS	Emergency Core Cooling System
EQ	Environmental Qualification
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
NCV	Non-Cited Violation
PCV	Pressure Control Valve
RHR	Residual Heat Removal
RHRSW	Residual Heat Removal Service Water
SDP	Significance Determination Process
TS	Technical Specification
URI	Unresolved Item
USAR	Updated Safety Analysis Report

LIST OF DOCUMENTS REVIEWED

The following is a list of licensee documents reviewed during the Monticello Design and Performance Capability Inspection 263/2001-15. This list may include documents prepared by others for the licensee. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety, but that selected sections or portions of the documents were evaluated as part of the overall inspection effort. Inclusion on this list also does not imply NRC acceptance of the document, unless this is specifically stated in the inspection report.

Modifications

Number	**Title**	**Revision or Date**
75M041	RHR SW Pump Replacement	October 10, 1979
82M068	RHRSW Cross-Tie	May 28, 1985
86L951	Limitorque L.S. Rotor Contact Changes	Revision 0
88M019	Replace RHR Pump Start Timers	Revision 0
90Z040	ECCS High Point Vents	February 27, 1991
91M038	RHR Pump Motor Changeout	Revision 2
92Q725	RHR Aux Air Compressor Motors	December 16, 1992
96Q150	RHRSW Air Vent Valve Modification	October 16, 1996
96Q170	ECCS Suction Strainer Modification	Revision 1
97FP26	Diesel Generator Source Breaker Modification	Revision 0
97ZN02	Control Room Air Handler Damper Replacement	Revision 0
98FP01	MOV Hot Short	Revision 0
98RV06	Full Length Control Rod Drive Mechanism Lower Canopy Seal Weld Overlay	Revision 0
99DC03	125 VDC Circuit Relocation Project	Revision 0
99EB01	1T1/1T2 Transformer Switches	Revision 0
99SF02	Replace 122 Spent Fuel Pool Heat Exchanger	Revision 0
99SI02	Re-Power RHR Sump B Suction Valves	Revision 0
99SI03	Nitrogen Supply to Accumulator	Revision 0
00Q100	Eliminate Manual Valving Prior to Start of RHRSW Pumps	January 4, 2001
00RH01	Install Trolley Beams for RHR Pits	Revision 0

Condition Reports Initiated as a Result of the Inspection

20014249	Compare Sargent & Lundy's report findings with previous water hammer evaluations in the RHRSW System	July 19, 2001
20014252	This CR to track disposition of identified USAR enhancement or clarifications	July 19, 2001
20014268	SSDI Unresolved item regarding appropriate testing frequency of RHRSW 3-1 and RHRSW 3-2	July 19, 2001
20014456	Calculation CA-97-041 is non-conservative in determining RHR HX differential pressure	July 27, 2001
20014483	Tech Spec, USAR and DBD basis not clearly defined for RHRSW pump and RHR HX differential pressure	July 30, 2001
20014487	Tech Manuals for RHR pump motors not clear as to which motor is associated with which pump	July 30, 2001
20014489	Mistake discovered in revision 2 of calculation 95-021	July 31, 2001
20014512	No procedure to turn off one RHR pump after torus peak temperature is reached during a LOCA. (Reference NRC SER 98 & calculation CA-97-157)	July 31, 2001
20014515	RHR room and motor cooling water discharge piping not color coded on Q-List to help control special concerns of pipe	July 31, 2001
20014565	Assess potential voiding of RHRSW during S/D cooling with subsequent loss of offsite power	August 2, 2001
20014566	Assess potential voiding of RHRSW during Torus cooling with subsequent loss of offsite power	August 2, 2001
20014567	IST Program scope may have inappropriately excluded control valves from code required testing (NRC SSDI Item)	August 1, 2001

Procedures

0137	Master Local Rate Test B022304	Revision 42
0255-04-IIA-1	RHR Loop A System Pressure Tests	Revision 11
0255-04-IIA-2	RHR Loop B System Pressure Tests	Revision 10
0255-05-IA-1	RHR Service Water Pump and Valve Tests	Revision 42
0255-05-IA-1	RHR Pump and Valve Tests	Revision 48

Procedures

0255-17-ID-4	RHR and RHRSW "A" Loop Air Supply Check Valve Leak Rate Test, Tests Performed 1/27/00, 3/24/98, 4/28/96, & 4/26/94	Revision 6
0255-17-ID-40CD	RHR and RHRSW "A" Loop Air Accumulator Check Valve Leak Rate Test	Revision 3
0255-17-ID-5	RHR and RHRSW "B" Loop Air Supply Check Valve Leak Rate Test, Test Performed 1/12/00, 4/1/98, 4/20/96, and 10/10/94	Revision 7
0255-17-ID-50CD	AWI-04.05.12	Revision 3
4 AWI-04.05.12	Replacement of Failed Fuses	Revision 2
4 AWI-01.	Condition Report Process	Revision 7
4 AWI-01.03.03	Color Coded P&ID Q-List Extension	Revision 3
4 AWI-05.06.02	10 CFR 50.59 Applicability Screenings	Revision 1
4 AWI-05.06.03	10 CFR 50.59 Evaluations	Revision 0
5AW1 6.1.0	Design Change General	Revision 3
EOP C.5-1100	RPV Control	Revision 7
EOP C.5-2006	RPV Flooding	Revision 8
EWI-08.15.02	Motor Operated Valve Program Engineering Standards	Revision 2
EWI-08.15.02	Motor Operated Valve Program Engineering Standards	Revision 2
MP-97Q110-01	Design Change Procedure Attachment to WO9800061	Revision 0
MP-97Q110-02	Design Change Procedure Attachment to WO9800062	Revision 0
MP-97Q255-01	Design Change Procedure Attachment to WO 9800059	Revision 0
MP-97Q255-02	Design Change Procedure Attachment to WO 9800060	Revision 0
MWI-3-M-2.06	Fuse/Breaker Coordination Study	Revision 0

Substitute Part/Component Equivalency Evaluation

ME-0164	RCP Seal Return MOV Motor Upgrade	February 4, 2000
ME-0220	Change of Material for the Pressurizer PORV Diaphragm	March 20, 2000
ME-0314	High Temperature O Rings for RCP Seals	March 14, 2000
ME-0336	Charging Pump Drive Shaft Keyway Dimensions	July 25, 2000

Commercial Grade Evaluation

CGE # PI-0052	Containment Penetration Blank Flange "O" Rings	Revision 2
CGE # PI-0151	Framatome-Burndy Calibration Service	Revision 2
CGE # PI-0204	MKS Instrument, Inc. Calibration Services	Revision 1
CGE # PI-0261	CC Heat Exchanger Relief Valve Piece Parts Consolidated Series 1975/1970	Revision 1
CGE # PI-0315	Velan 8" Globe and Gate Valves	Revision 0

Calculations

98-272	Evaluation of Transient Voltage Effects on MOV Starter Control Circuits	Revision 1
92-221	RHR System MOV Performance Analysis	Revision 3
92-224	Emergency Diesel Generator Loading	Revision 4
94-052	Cable Tray Block Calculation	Revision 0
95-022	Instrument Setpoint Calculation, RHR Interlock PS-10-105E, F, G and H	Revision 3
97-090	AC Voltage Study, Minimum 480V Voltage Determination During Diesel LOOP/LOCA ECCS CS Start Test Conditions	Revision 2
98-128	Core Spray & RHR Motor High Voltage Termination Insulation Evaluation	Revision 0
98-272	Evaluation of Transient Voltage Effects on MOV Starter Control Circuits	Revision 1
CA-00-104	Intake Structure Minimum Water Level	Revision 7
CA-01-062,	RHR Pump Flow Measurement Uncertainties	Revision 0

Calculations

CA-01-133	Length of Time for RHR Min Flow Valve Accumulators to Maintain Valves Closed with Small Air Leak	Revision 0
CA-1-063	RHRSW Keep-Fill Maximum Capacity	Revision 0
CA-88-020	Calculation of RHR Auxiliary Air Compressor System Pressure During Operation Under Most Extreme Limiting Conditions	December 22, 1988
CA-90-18	Determination of Acceptance Criteria for RHR Pump Surveillance Testing and Verification of Adequate LPCI Flow Under Four and Two Pump Operation	January 9, 1991
CA-91-063	Determination of Uncertainty in RHR Pump Differential Pressure Measurement During Performance of Test 0255-04-III	Revision 7
CA-92-038	Determination of RHRSW Instrumentation Inaccuracies	Revision 4
CA-94-095	PCV-3004 and PCV-3005, RHRSW Pump Motor Cooler Pressure Regulators, Failure Analysis	Revision 5
CA-95-018	Analysis of Replacement Valves for SW-21-1, SW-21-2, SW-22-1, and SW-22-2 (SW-to-RHRSW Check Valves)	Revision 2
CA-97-041	RHR Heat Exchanger Differential Pressure Requirements	Revision 4
CA-97-077	LLRT Test Volumes for the RHR and RHRSW Air Supply Loop "B". AI-243-1, AI-244-1, AI-610-1, and AI-610-3	Revision 0
CA-97-245	Determination of NPSH Available for Low Pressure ECCS Pumps for a DBA LOCA	Revision 0
ENG-CS-132	Seismic Criteria for Control Room Dampers	Revision 0.
ENG-CS-144-2	CCHX End-Bell Lifting Device Trolley Beam 1 and 2	Revision 0
ENG-CS-186	Unit 1 Condenser Storage Pit Ladder/Guard Rail/Jib Crane	Revision 0
ENG-EE-018	Diesel Generator Sequence Loading for an SI Event Occurring with a Loss of Offsite Power (LOOP) for D1, D2, D5 &D6	May 13, 1994

Calculations

ENG-EE-021	Diesel Generator Sequence Loading for an SI Event Occurring with a Loss of Offsite Power (LOOP) for D1, D2, D5 &D6	Revision 2
ENG-EE-045	Diesel Generator Steady State Loading for a Loop Coincident with an SBO	Revision 3
ENG-EE-127	Cable Sizing Calculation for Six Motor Valves for Project 98EB02	Revision 0
ENG-EE-128	DC Voltage Drop Calculation for 98ZN04	September 16, 1999
ENG-EE-133	Thermal Overload and Circuit Breaker Sizing for MOV-32180 and 32181	May 5, 2000
ENG-ME-405	Damper Supports in Mechanical Equipment Room AB	Revision 0
ENG-ME-430	Nitrogen Injection for RCS Drain Down	Revision 0
No Number	Allowable Leakage Rates for Air Check Valves	dated March 12, 1987
RHRS CA-95-043,	CV-1728 and CV-1729 (RHR Hx W out) Positioner	
SPC-EG-0011	D1/D2 Emergency Diesel Generator Fuel Oil Day Tank Level Switch Set-points	Revision 1

Condition Reports Reviewed During the Inspection

19971188	Higher ECCS Suction Strainer Head Losses Calculated	April 15, 1997
19972676	Low Flow on #11 and #13 RHRSW Motor Coolers	October 17, 1997
19980770	RHRSW Pumps Motor Cooling Flow Higher than Vendor Recommendation	March 29, 1998
19981566	12 RHRSW run without Motor Cooling	June 17, 1998
19991680	RSW Pump Maximum Thrust Bearing Cooling Water Flow Discrepancy	June 15, 1999
19992604	Steam Exclusion Boundary Block Walls	September 3, 1999
19993183	Line numbers 3, 4, and 5 of Purchase Order 1020SQ had different part numbers than the requisition without a SPCE being issued	November 10, 1999
19993184	Failure to prepare a formal design change or equivalency evaluation for 121/122 control room chiller room dead bolts	November 10, 1999

Condition Reports Reviewed During the Inspection

20000392	Clarification of EDG Loading Acceptance Criteria	January 22, 2000
20000512	Concrete anchors did not meet the final embedment depth specified	March 2, 2000
20000549	A RHR Minimum Flow air Accumulator Check Valves Fail ASME Section XI Leak Testing	February 1, 2000
20000740	Verification that MCC Contactors for MOVs will not drop out during ECCS Loading Sequence	February 12, 2000
20000763	Update RHR Functional/Performance Analyses to Incorporate Information from CA-96-091	February 14, 2000
20000804	Engineering was planning to perform an unauthorized modification utilizing the work control process	March 23, 2000
20002461	Installation of Fire Damper VFD-62 has taken an excessive amount of time to complete due to poor design and preparation	June 29, 2000
20002493	During RHRSW Inst PM 7070 on B Side Found DPIC-10-130B Div 2 RHR SW Outlet Controller Would Not Function in Auto	June 14, 2000
20002516	Both loops RHRSW declared inoperable due to low standby system pressure.	June 17, 2000
20003060	D1/D2 load sequence DC power supply	August 17, 2000
20003180	13 RHRSW Pump Declared Inoperable Due to One of the Two Motor Heaters Not Operating	August 22, 2000
20003535	Potential single failure vulnerability of RHRSW system in standby with RHRSW-32 cross tie valve open	September 14, 2000
20004336	The welding outlet in the north warehouse was wired incorrectly, which led to damage to the cask transport vehicle pump	October 10, 2000
20004731	"B" RHRSW keep fill system unable to maintain standby pressure above setpoint of alarm CO3-B19	December 1, 1999
20004811	Reactor makeup flow transmitters for Volume Control Blenders are inaccurate, obsolete and need to be replaced	October 27, 2000
20010065	NRC Inspection Raised Concern Associated with Lack of Calculation Supporting 11 ESW Overload Setpoint Change Request 99-016	January 4, 2001

Condition Reports Reviewed During the Inspection

20010897	GE Safer/Geste LOCA analyses for Monticello did not account for RHR pump minimum by-pass flow in 3 cases	February 15, 2001
20011357	Feedwater flow control valve solenoid valves incorrectly downgraded to commercial grade by safety evaluation #386	February 8, 2001
20011494	Review of assumptions in accidents and license basis events for control of plant initial conditions & operator actions	March 13, 2001
20011955	RHRSW Pump & Valve Test (0255-05-IA-1) performed w/RHRSW X-tie open could assist in passing acceptance criteria	April 2, 2001
20012995	Modification self-assessment recommended actions to improve modification process	March 30, 2001
20014249	Compare S&L report findings with previous waterhammer evaluations in the RHRSW System	July 19, 2001
20014249	Compare S&L report findings with previous waterhammer evaluations in the RHRSW system	July 20, 2001
20014252	SSI: CR to track disposition of identified USAR enhancement or clarifications	July 19, 2001
20014456	CA-97-041 is non-conservative in determining RHR HX DP	July 27, 2001
20014483	Tech Spec, USAR and DBD basis not clearly defined for RHRSW pump and RHR Hx DP requirements	July 30, 2001

Drawings

6453-M212B-1-3	As Built Machining of Suction Bell to Fit Sump Hole Per MO79-54	Revision A
FSK-764	Heat Exchanger E-200A, Vents & Drains	Revision B
FSK-806	Heat Exchanger E-200B, Vents & Drains	Revision B
M-404, Sheet 11	Indicator Data Sheet (All Pressure Actuated Gages)	No Revision number
M-441, Sheet 7	Air Operated Control Valve Data Sheet	Revision 2
M-449, Sheet 4	Self-Operated Control Valve Data Sheet	Revision 2
M-497, Sheet 23	RHR Bypass Valve Air Supply Arrangement Drawing	Revision 1

Drawings

ND-57664-1	Line Designation Table RHR & Emergency Service Water	Revision G
ND-57664-2	Line Designation Table RHR & Emergency Service Water	Revision F
ND-57664-3	Line Designation Table RHR & Emergency Service Water	Revision F
ND-57664-4	Line Designation Table RHR & Emergency Service Water	Revision D
ND-57664-5,	Line Designation Table RHR & Emergency Service Water	Revision C
NF-13142-55	Service Water (RHR) Intake	Revision G
NF-178627-1	Torus Strainer Installation, Bay 3	Revision A
NF-178627-2,	Penetration Screen Installation Details	Revision A
NF-178627-3,	Torus Strainer Installation, Bay 7	Revision A
NF-178627-4	Torus Strainer Installation, Bay 11	Revision A
NF-178627-5	Torus Strainer Installation, Bay 15	Revision A
NF-178627-6	Rams Head Assembly	Revision A
NF-36177	Single Line Meter and Relay Diagram 4160 Volt Buses 13, 14, 15 & 16	Revision S
NF-36177	Single Line Meter and Relay Diagram 4160 Volt Buses 13, 14, 15 & 16	Revision S
NF-36453	Intake Structure Sections & Details, Sh 1	Revision A
NF-36454	Intake Structure, Plan at El. 919'-0"	Revision unreadable
NGS-96Q150-03	Manual Air Relief Valve RHRSW52-1 Assembly Installation	Revision 2
NH-36246	P&ID Residual Heat Removal System, Sheet 1	Revision BH
NH-36247	P&ID Residual Heat Removal System, Sheet 2	Revision BK
NH-36664	P&ID - RHR Service Water & Emergency Service Water Systems	Revision BF
NH-36665	Service Water System and Make-Up Intake Structure, P&ID	Revision CD
NH-36665-2	Service Water System and Make-Up Intake Structure, P&ID	Revision G
NH-36665-3	Biocide Injection System P&ID	Revision D

Drawings

NH-36667	P&ID Miscellaneous Piping, Circulating Water System	Revision S
NX-14084-135	Vibration Control RHR Service Water SW9-18" Heat Exch. Outlet	no Revision number
NX-33739	8" - 300 Weld Ends Carbon Steel Flex Wedge Gate Valve with 20" Dia Handwheel	Revision A
NX-41820	RHR Head Spray Valve MO-2027, Double Disc Gate Valve With SMB-00-7-1/2 Limitorque Actuator.	Revision A
NX-55394	Shaft for K6329	Revision A
NX-7905-34	Residual Heat Removal Pumps	Revision 4
NX-7905-58	Residual Heat Removal Pump Characteristic Curve Data Sheet	Revision A
NX-7905-59	Residual Heat Removal Pump Characteristic Curve Sheet	Revision A
NX-7905-69-1	Turbine Pump - 6 Stage 18CC Pump 1785 RPM Curve No. TC-03084	Revision A
NX-7905-69-2	Test Data Sheet [RHRSW Pump]	Revision A
NX-7905-70-1	Turbine Pump - 6 Stage 18CC Pump 1785 RPM Curve No. TC-03085	Revision A
NX-7905-70-2	Test Data Sheet [RHRSW Pump]	Revision A
NX-7905-71-1	Turbine Pump - 6 Stage 18CC Pump 1785 RPM Curve No. TC-03086	Revision A
NX-7905-71-2	Test Data Sheet [RHRSW Pump]	Revision A
NX-7905-72-1	Turbine Pump - 6 Stage 18CC Pump 1785 RPM Curve No. TC-03067	Revision A
NX-7905-72-2	Test Data Sheet [RHRSW Pump]	Revision A
NX-7905-73	Outline RHR Pump Induction Motor	Revision C
NX-7905-73-1	Turbine Pump - 6 Stage 18CC Pump 1785 RPM Curve No. TC-05674	Revision A
NX-7905-73-2	Test Report [RHRSW Pump]	Revision A
NX-7905-74	600 HP RHR Pump Motor	Revision C
NX-7905-76	Outline RHR Pump Induction Motor	Revision A
NX-8291-116	Suppression Chamber Access Hatch	Revision A
NX-8702-54-1	RHRSW Control Valves CV-1728 & CV-1729	Revision H

Drawings

NX-9068-37	Outline Induction Motor [RHRSW]	Revision E
NX-9068-47	Outline - Spare RHRSW Pump Motor	Revision C
NX-9170-1	Outline and General Arrangement 2 Stage, 2 Cylinder, Receiver Mounted, Motor Driven, Type 20 Air Compressor	February 20, 1970
NX-9170-2	Outline and General Arrangement Aftercoolers & Accessories Type-30 Air Compressor	Revision A
NX-9231-12	10" 300 # Globe Valve Stop C. S. M. O. Syncroset-70NA1 (Isol.)	Revision H
NX-9231-12A	70NA1 Syncroset Side Handwheel AOP.6	Revision A
NX-9235-102-2	Outline-MO-2030 Operator	Revision B
NX-9235-2A	8"-600 Weld Ends Carbon Steel Flex Wedge Gate Valve with Stellite Trim and SMB-1-40 Limitorque Actuator	Revision C
NX-9235-43A	3"-600 Weld Ends Carbon Steel Flex Wedge Gate Valve with Stellite and SMB-00-15 limitorque Operator	Revision D
NX-9522-2	12" - 300 Pound Swing Check Valve	Revision B
NX-9525	Vertical Turbine Pump - Open Type Surface Discharge Head Typical Section	Revision 3
NX-9525-1	15H-27708 Stage Vertical Turbine Pump	Revision B
NX-9652-1	Sinlex Basket Strainer	Revision A

Operability Evaluations

19972676	Inadequate Pick-up Voltage Testing of RHR Time Delay Relays	Level 1 CL GEN
19980566	12 RHRSW Run Without Motor Cooling	Level 1 CL GEN
19980770	RHRSW Pumps Motor Cooling Flow Higher Than Vendor Recommendation	Level 2 CL GEN

Specifications

Technical Specification 3/4.5	Core and Containment Spray/Cooling Systems and Bases
Technical Specification 3/4.7	Containment Systems and Bases

Specifications

Technical Specification 3/4.15	Inservice Inspection and Testing and Bases	
Technical Specification 6.5	Plant Operating Procedures	
UAL 198L	D-C Fuses for Industrial Use	March 3, 1988
5828-M-163	Specification for RHR Auxiliary Air Compressors	November 12, 1969
MPS-1100	Specification for the Analysis of Piping and Piping Support Systems.	Revision 5

Surveillances and Tests

Number	Title	Revision or Date
0187-01	12 Emergency Diesel Generator/12 Emergency Diesel Water Pump System Tests	Revision 34, Janaury 1, 2001
0187-01	11 Emergency Diesel Generator/11 Emergency Diesel Water Pump System Tests	Revision 34, December 18, 2000
0187-02	12 Emergency Diesel Generator/ 12 Emergency Service Water Pump System Tests	Revision 34, Janaury 1, 2001
0198-1	11 Battery 125 VDC Battery Capacity Test	Revision 1, February 6, 2000
0198-2	12 Battery 125 VDC Battery Capacity Test	Revision 1, February 6, 2000
24.204.01	Division I LPCI & Torus Cooling/ Spray Pump And Valve Operability Test	February 7, 2001
24.204.06	Division II LPCI & Torus Cooling/ Spray Pump And Valve Operability Test	March 21, 2001
44.020.302	Reactor Pressure - Shutdown Cooling Cut in Permissive Interlock, Division II Functional Test	December 4, 2000
44.020.304	Reactor Pressure - Shutdown Cooling Cut in Permissive Interlock, Division II Calibration/ Functional	June 7, 2000

Updated Safety Analysis Report Sections

6.3	Emergency Core Cooling System (ECCS)	18
8.3	Auxiliary Power System	18
8.4	Plant Standby Diesel Generator Systems	18

Updated Safety Analysis Report Sections

8.5	DC Power Supply Systems	18
USAR Section 1.2,	Principle Design Criteria.	
USAR Section 5.2.2.5	Primary Containment Auxiliary Systems	
USAR Section 5.2.3.3	Containment Analysis Results	
USAR Section 6.1.3	Emergency Core Cooling Systems (ECCS)	
USAR Section 6.2	Emergency Core Cooling Systems (ECCS)	
USAR Section 7.1.1	Monticello Conformance to IEEE 279 [Single Failure Criteria]	
USAR Section 14.7.2.3	Emergency Core Cooling System Performance	
USAR Section 14.7.2.4	Radiological Consequences [for LOCA]	
USAR Appendix 14A Update	[Power Uprate Update]	
USAR Section 10.2.4	Reactor Shutdown Cooling and Reactor Vessel Head Spray System	
USAR Section 10.4.2	Residual Heat Removal System Service Water System	
USAR Section 8.3	Auxiliary Power System	
USAR Section 8.4	Plant Standby Diesel Generator Systems	
USAR Section 8.8	Electrical Design Considerations	

Correspondence

Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 102 to Facility Operating License No DPR-22, Northern States Power Company, Monticello Nuclear Generating Station, Docket No. 50-263 [Power Uprate SER]

NSP letter to NRC dated 12/31/79 Concerning TMI Lessons Learned Implementation

NRC SER dated 3/21/80 Concerning NSP TMI Lessons Learned Submittal

Correspondence

NSP Letter to NRC dated 12/31/79, Lessons Learned Implementation

Evaluation of Licensee's Compliance with Category "A" Items of NRC Recommendations Resulting from TMI-2 Lessons Learned, Docket No. 50-263, dated 3/21/80

NSP Letter to NRC dated 12/12/80, TMI Lessons Learned Category A Technical Specification Changes

NSP Letter to NRC dated 12/30/80, Post TMI Recommendations - NUREG-0737

Safety Evaluation [of incorporation of TMI-2 Lessons Learned Category "A" Requirements] dated 3/2/81

NRC letter to NSP dated 12/22/81 transmitting inspection report addressing NUREG-0737 Item III.D.1.1.1 - Primary Coolant Outside Containment - Leak Reduction. NSP letter to NRC dated 6/8/93, Response to NRC Bulletin 93-02, "Debris Plugging of Emergency Core Cooling Suction Strainers"

NSP letter to NRC dated 4/19/94, Initial (60 day) Response to NRC Bulletin 93-02, Supplement 1, "Debris Plugging of Emergency Core Cooling Suction Strainers"

NSP letter to NRC dated 6/8/94, Follow-Up Response to NRC Bulletin 93-02, Supplement 1, "Debris Plugging of Emergency Core Cooling Suction Strainers"

NRC letter to NSP dated 6/8/94, Response to NRC Bulletin 93-02, "Debris Plugging of Emergency Core Cooling Suction Strainers"

NSP letter to NRC dated 5/4/00, Closeout of Commitments Associated with Structural Design of ECCS Suction Strainers (TAC No. M96156)

Correspondence

	NRC letter to NSP dated 7/25/97 transmitting license amendment regarding Updated Analysis of DBA Containment Temperature and Pressure Response and Reliance on Containment Pressure to Compensate for Potential Deficiency in NPSH for ECCS Pumps During DBA	

Generic Communications

IN 00-08	Inadequate Assessment of the Effect of Differential Temperature on Safety-Related Pumps	May 14, 2000

Miscellaneous Documents and Records

	Multiplex Deep Well Air Valves Vendor Documentation	
	Empire Specialty Company 3"-16" Surge Check Valve Vendor Documentation	
	Design Basis Document: NUREG-0737, Item III.D.1.1, Integrity of Systems Outside Containment Likely to Contain Radioactive Material for Pressurized-Water Reactors and Boiling-Water Reactors	
	Engineering Standards Manual, EMS-05.12, Revision 1, Special Items to Consider (Miscellaneous), NUREG 0737	
	Item III.D.1.1 Commitments, January 1980 Submittal Leak Detection Program	
8285	Non-Identical Fuse Replacement	Revision 3
Calculation CA-97-090	“AC Voltage Study”	Revision 0
Configuration Management Follow-On Item Resolution Assessment Number 91-0295	RHR Bypass Valve Accumulator Tank Sizing.	May 9, 1993
Evaluation No. 2001-09121	Evaluation of Potential Water Hammer Events Within the RHR Service Water System	Revision 0, July 18, 2001

Miscellaneous Documents and Records

Form 3448	Fuse Replacement Information Form	Revision 8
Operations Manual Section B.03.04-01	Residual Heat Removal System	Revision 3
QA Report FG-97-006	“Power Rerate License Amendment Request & Associated Topical Reports’ Accuracy”	
Safety Revisioniew Item No. 91-035	Piping Operability & Two-Over-One Criteria	Revision 11
Tech. Manual No. NX-8936-32	RHR Service Water Pumps (Johnson Pump)	NSP Revision 7
Work Order 9904975	Identify/Repair Air Leaks on "B" RHR Min Flows	
Work Order 9904973	Identify/repair air leaks on "A" RHR Min Flows	
XOE 19993431	Overcurrent Protection in Direct Current Circuits	July 17, 2001