May 31, 2000

Mr. Thomas J. Palmisano
Site Vice President and General Manager
Palisades Nuclear Generating Plant
Consumers Energy Company
27780 Blue Star Memorial Highway
Covert, MI 49043-9530

SUBJECT: PALISADES INSPECTION REPORT 50-255/2000005(DRS)

Dear Mr. Palmisano:

On May 11, 2000, the NRC completed a baseline biennial Safety System Design and Performance Capability inspection at your Palisades Nuclear Generating Plant. The results of this inspection were discussed with you and other members of your staff at the end of the inspection. The enclosed report presents the risk-significant results of this inspection.

The inspection was an examination of activities conducted under your license as they related to ensuring that the high pressure safety injection system and the high pressure control air system were capable of performing their required post-accident functions, and to verify compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selected examination of procedures and representative records, observations of activities, and interviews with personnel.

During this inspection, one Non-Cited Violation of NRC regulations was identified. This violation involved a deficiency in your Emergency Operating Procedure for Loss of Coolant Accident Recovery. The procedure was not appropriate to the circumstances in that a specific manual action, needed to ensure that the high pressure recirculation function of the high pressure safety injection and containment spray systems was maintained, was not included in the procedure. This deficiency had very low risk significance because it hypothesized the extremely low probability, simultaneous occurrence of a Loss of Coolant Accident, Loss of Offsite Power, and the loss of the specific diesel generator which supplied power for two of the three containment spray pumps. Because your staff identified this issue and took aggressive action to address it, no response is required.

If you contest the violation or the severity level of the Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-001, with a copy to the Regional Administrator, Region III, Resident Inspector and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Electronic Reading Room (PERR) link at the NRC home page, http://www.nrc.gov/NRC/ADAMS/index.html.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA/

John A. Grobe, Director
Division of Reactor Safety

Docket No. 50-255
License No. DPR-20

Enclosure: Inspection Report 50-255/2000005(DRS)

cc w/encl: R. Fenech, Senior Vice President, Nuclear,
Fossil, and Hydro Operations
N. Haskell, Director, Licensing and Performance Assessment
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Department of Attorney General (MI)
Emergency Management Division, MI Department
of State Police

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Docket No. 50-255
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cc w/encl: R. Fenech, Senior Vice President, Nuclear,
Fossil, and Hydro Operations
N. Haskell, Director, Licensing and Performance Assessment
R. Whale, Michigan Public Service Commission
Michigan Department of Environmental Quality
Department of Attorney General (MI)
Emergency Management Division, MI Department
of State Police

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-255
License No:	DPR-20
Report No:	50-255/2000005(DRS)
Licensee:	Consumers Energy Company
Facility:	Palisades Nuclear Generating Plant
Location:	27780 Blue Star Memorial Highway Covert, MI 49043-9530
Dates:	April 17 - May 11, 2000
Inspectors:	Haywood Anderson, Consultant Zelig Falevitz, Reactor Engineer Martin Farber, Reactor Engineer, Team Leader Gerard O'Dwyer, Reactor Engineer Tirupataiah Tella, Reactor Engineer
Approved by:	Ronald N. Gardner, Chief Electrical Engineering Branch Division of Reactor Safety

SUMMARY OF FINDINGS

Palisades Nuclear Generating Plant
NRC Inspection Report 50-255/2000005(DRS)

This was an announced biennial baseline inspection of safety system design and performance capability of the high pressure safety injection and high pressure control air systems. The inspection objective was to verify that the design basis was correctly implemented to ensure that the system can be relied upon to meet its functional requirements.

Cornerstone: Mitigating Systems

- Green: The failure to include steps required to ensure operability of the high pressure recirculation function of emergency core cooling systems in Emergency Operating Procedure (EOP) 4.0 (Loss of Coolant Accident Recovery) rendered the procedure inappropriate to the circumstances (i.e., mitigation of a design basis accident). This is a Non-Cited Violation of 10 CFR 50, Appendix B, Criterion V. This violation was identified by the licensee and entered in the corrective action program as CPAL0001274.

  This deficiency had a very low risk significance because it hypothesized the extremely low probability, simultaneous occurrence of a Loss of Coolant Accident, Loss of Offsite Power, and the loss of the specific diesel generator which supplied power for two of the three containment spray pumps.

NRC's REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent little effect on safety. WHITE findings indicate issues with some increased importance to safety, which may require additional NRC inspections. YELLOW findings are more serious issues with an even higher potential to affect safety and would require the NRC to take additional actions. RED findings represent an unacceptable loss of safety margin and would result in the NRC taking significant actions that could include ordering the plant to shut down.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. The color for an indicator corresponds to levels of performance that may result in increased NRC oversight (WHITE), performance that results in definitive, required action by the NRC (YELLOW), and performance that is unacceptable but still provides adequate protection to public health and safety (RED). GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, as described in the matrix. The NRC's actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.

Report Details

1. REACTOR SAFETY

Cornerstone: Mitigating Systems

1R21 Safety System Design and Performance Capability

a. Inspection Scope

Two systems were selected for this inspection: the high pressure control air system (HPA) and the high pressure safety injection (HPSI) system. These systems were selected based upon:

- performing a mitigating system function;
- having high safety significant maintenance rule functions;
- having high risk achievement worths in the probabilistic risk assessment;
- not having received recent NRC review (for HPSI); and
- supporting multiple systems (high pressure control air).

The systems were considered complementary in that high pressure control air operates valves in the emergency core cooling system.

For the HPSI system, the following inspection attributes were reviewed in detail:

System Needs	
Attributes	**Inspection Activity**
Process Medium • water	Verify that process medium will be available and unimpeded during accident/event conditions • sufficient inventory available before/after recirculation actuation • check consideration for alternate water supplies
Energy Source • electricity • air	Verify energy sources, including those used for control functions, will be available and adequate during accident/event conditions • Verify that pump motor voltage will be at least 70% of rated voltage (.7X2400=1680) • review capability to accelerate to full speed in 4 seconds at 70% rated voltage • Verify acceptability of load shed/degraded voltage setpoint • Verify adequate air pressure for air-operated valves (AOV) or availability of backup N_2 accumulators

System Needs	
Attributes	**Inspection Activity**
Controls • initiation actions • control actions • shutdown actions	Verify control system will be functional and provide desired control during accident/event conditions • Review Safety Injection Signal (SIS) to HPSI pump motor breaker • Review logic/schematic for recirc actuation signal • Review logic/schematic for pump controls
Operator Actions • initiation • monitoring • control • shutdown	Verify operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions • review that operator actions for recirc actuation (swap-over can be accomplished within desired time frame) Verify instrumentation and alarms are available to operators for making necessary decisions • review for adequate instrumentation for monitoring recirc actuation (swap-over)
Heat Removal • cooling water • ventilation	Verify that heat will be adequately removed from system • review logic/schematics for safeguards room ventilation system actuation • review sizing of safeguards room coolers • review service water flow requirements to coolers • review component cooling water availability to HPSI pumps' seal packages

System Condition and Capability	
Attributes	**Inspection Activity**
Installed Configuration • elevations • flowpath components • restraints/supports • cable runs/separation	Verify, by walkdown or other means, that system-installed configuration will support system function under accident/event conditions • review sump screen cleanliness controls • review overall containment foreign material exclusion programs • review cable tray loading • review bolting on mechanical piping connections • review bolting on supports/restraints Verify that component configurations have been maintained to be consistent with design assumptions • review system line-up changes
Operation	Verify that operation and system alignments are consistent with design and licensing basis assumptions • review system operating line-up to ensure functions are maintained • review off-normal procedures to ensure operability of components is maintained during alternate system line-ups
Design • calculations • drawings • procedures	Verify that design bases and design assumptions have been appropriately translated into design calculations, drawings, and procedures • review voltage calculations to ensure adequate voltage is available to components during an accident • cable separation/routing, sizing, ampacity • review net positive suction head calculations • review vortexing calculations

System Condition and Capability	
Attributes	**Inspection Activity**
Testing • flowrate • pressure • temperature • valve stroking • valve leakage	Verify that acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met • review system surveillances to ensure Technical Specification requirements are met • review pump inservice test data • review valve (motor-operated valve and AOV) testing • review flow testing for balancing/50-50 split/minimum total flow Verify that individual tests and/or analyses validate integrated system operation under accident/event conditions • review leak testing of valves which isolate Emergency Core Cooling System recirculation flow from Safety Injection Refueling Water (SIRW) tank

For the HPA system, the following inspection attributes were reviewed in detail:

System Needs	
Attributes	**Inspection Activity**
Process Medium • air	Verify that process medium will be available and unimpeded during accident/event conditions. • review seismic qualification of receiver and downstream piping
Energy Source • electricity	Verify energy sources, including those used for control functions, will be available and adequate during accident/event conditions • review procedures to ensure that power can be restored to the compressors following load shed • review availability of safety-related power to valve operating solenoids
Controls • control actions • shutdown actions	Verify control system will be functional and provide desired control during accident/event conditions. • review instrumentation associated with process controls

System Needs	
Attributes	**Inspection Activity**
Operator Actions • initiation • monitoring • control • shutdown	Verify operating procedures (normal, abnormal, or emergency) are consistent with operator actions for accident/event conditions • review system operating procedure • identify instrumentation needed during accident scenario • review calibrations of necessary instrumentation Verify instrumentation and alarms are available to operators for making necessary decisions • review setpoints for pressure switches • review alarm setpoints • review location and availability of air receiver pressure • review location and availability of instrumentation for monitoring air pressure at AOVs

System Condition and Capability	
Attributes	**Inspection Activity**
Installed Configuration • restraints/supports • flowpath components	Verify, by walkdown or other means, that system-installed configuration will support system function under accident/event conditions • review bolting of mechanical joints • review bolting of restraints/supports • review installation of instrumentation Verify that component configurations have been maintained to be consistent with design assumptions. • review a sample of modifications
Operation	Verify that operation and system alignments are consistent with design and licensing basis assumptions • review system operating procedures to ensure proper system lineup • review pressure switch setpoints to ensure receiver pressure is maintained >Final Safety Analysis Report (FSAR) allowable

System Condition and Capability	
Attributes	**Inspection Activity**
Design • calculations • drawings • procedures	Verify that design bases and design assumptions have been appropriately translated into design calculations, drawings, and procedures • check system lineup in procedure against FSAR • check P&IDs against FSAR • review calcs for receiver capacity
Testing • flowrate • pressure • dewpoint • valve stroking	Verify that acceptance criteria for tested parameters are supported by calculations or other engineering documents to ensure that design and licensing bases are met • check availability of calc for receiver size • review records of dewpoint testing Verify that individual tests and/or analyses validate integrated system operation under accident/event conditions • check test initial conditions to ensure consistency with FSAR

Discharge Check Valves and Receivers	
Attributes	**Component Inspection Activity**
Component Degradation	Verify that potential degradation is monitored or prevented • check equipment trending • determine if check valve is tested for back-leakage
Equipment/ Environmental Qualification • Temperature • Humidity • Radiation	Verify that equipment qualification is suitable for the environment expected under all conditions

Discharge Check Valves and Receivers	
Attributes	**Component Inspection Activity**
Equipment Protection • missile • high energy line break	Verify equipment is adequately protected • review susceptibility of check valves and receivers to missile impact • review susceptibility of check valves and receivers to high energy line break
Component Inputs/Outputs	Verify that component inputs and outputs are suitable for application and will be acceptable under accident/event conditions
Operating Experience	Verify that applicable insights from operating experience have been applied to the selected components • review operating experience for air system issues

In the area of corrective actions, the team reviewed condition reports concerning HPSI and HPA issues to verify that the licensee had an appropriate threshold for identifying issues. The team also evaluated the effectiveness of the corrective actions for the identified issues.

b. Issues and Findings

.1 Procedural Deficiency

During the inspection, the licensee conducted a review of Emergency Operating Procedure (EOP) 4.0, Loss of Coolant Accident Recovery, and identified a condition where a manual action, required to ensure the operability of the high pressure recirculation function of the emergency core cooling systems, was not proscribed in the procedure. During recovery from a loss of coolant accident, with a loss of offsite power and failure of the 1-1 diesel generator, after recirculation actuation, the one operating containment spray pump would be attempting to supply two containment spray headers and suction for the HPSI pump. This would exceed the capacity of the pump, forcing it into runout and loss of net positive suction head. The required response would be to isolate one containment spray header; however, with a containment high pressure signal still in place, this could not be accomplished without the installation of a jumper. This was not proscribed in the procedure. This deficiency had very low risk significance because it hypothesized the extremely low probability, simultaneous occurrence of a Loss of Coolant Accident, Loss of Offsite Power, and the loss of the specific diesel generator which supplied power for two of the three containment spray pumps.

Failure to include the steps required to ensure operability of the high pressure recirculation function in EOP 4.0 rendered the procedure inappropriate to the circumstances (i.e., mitigation of a design basis accident). This is a violation of 10 CFR 50, Appendix B, Criterion V. This violation is considered a Non-Cited Violation (50-255/20005-01), consistent with the General Statement of Policy and Procedure for

NRC Enforcement Actions (NUREG 1600) (Enforcement Policy), Section VI.A.1. This violation was entered in the licensee's corrective action program as CPAL0001274. This violation is closed.

.2 High Pressure Safety Injection System

No findings were identified during this inspection.

.3 High Pressure Control Air System

No findings were identified during this inspection.

4. OTHER ACTIVITIES

4OA4 Other

.1 (Closed) Inspection Follow-up Item (IFI) 50-255/97201-21: DC Loading Analysis

The team reviewed the following calculations and determined that the issues were appropriately addressed:

- EA-CPAL-97-1620A-01, "Formalize a Bounding Calculation for the 125 Vdc System, for Worst Case Voltage Levels at the Loads Based upon Battery Degraded Voltage During Station Blackout," Revision 0, October 9, 1998.
- EA-ELEC-LDTAB-009, "Battery Sizing for the Palisades Class IE Station Batteries DO1 and DO2," Revision 3, January 20, 2000.
- EA-ELEC-VOLT-001, "Determination of Worst Case Low Voltage at Engineered Safeguards Direct Current Solenoid Valves when Station Battery is at 105 Volts," Revision 1, November 2, 1992.

This item is closed.

.2 (Closed) IFI 50-255/97201-23: DC Calculations

The item was included in the review discussed in .1 above and is closed.

.3 (Closed) IFI 50-255/97201-24: DC Load Terminal Calculation

This item was included in the review discussed in .1 above and is closed.

4OA5 Management Meetings

.1 Exit Meeting Summary

The team leader presented the inspection results to Mr. Thomas J. Palmisano, Site Vice President and General Manager, and other members of licensee management in an exit meeting on May 11, 2000. The licensee acknowledged the information and the finding presented. The team leader asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

B. Bauer, Operations
G. Baustian, Nuclear Engineering
E. Bogue, Chemistry and Radiological Services
G. Boss, Operations
S. Brain, Nuclear Performance Assessment Department
D. Cooper, Plant Manager
B. Dotson, Licensing
J. Ford, Engineering Programs
G. Foster, Engineering Programs
R. Gerling, Engineering
K. Haas, Engineering Director
P. Harden, Design Engineering Manager
N. Haskell, Licensing Director
H. Heavin, Controller
R. Kasper, Construction
C. Krugh, Design Engineering
D. Malone, Licensing
H. Nixon, Engineering Programs
T. Palmisano, Site Vice President
W. Reetz, Business Operations
C. Ritt, Plant Support
S. Salgia, Design Engineering
J. Schwan, System Engineering
J. Slinkard, System Engineering
D. Sonnenberg, Design Engineering
K. Speicher, System Engineering
H. Stacks, Design Engineering
T. Swiecicki, Design Engineering
R. Vincent, Licensing
S. Wawro, Maintenance and Planning

NRC

M. Jordan, Chief, Branch 3, Division of Reactor Projects
R. Krsek, Resident Inspector
J. Lennartz, Senior Resident Inspector
T. Tongue, Project Engineer

LIST OF BASELINE INSPECTIONS PERFORMED

IP 71111.21 Safety System Design and Performance Capability

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Opened and Closed during this Inspection

50-255/20005-01	NCV	Failure to include required steps in EOP-4.0, Loss of Coolant Accident Recovery

Previous Items Closed

50-255/97201-21	IFI	DC Loading Analysis
50-255/97201-23	IFI	DC Load Calculations
500255/97201-24	IFI	DC Load Terminal Calculations

Previous Items Discussed

None

LIST OF ACRONYMS USED

AOV	Air Operated Valve
CFR	Code of Federal Regulations
DC	Direct Current
DPR	Demonstration Power Reactor
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling Systems
EOP	Emergency Operating Procedure
FSAR	Final Safety Analysis Report
HPA	High Pressure Control Air
HPSI	High Pressure Safety Injection
IFI	Inspection Follow-up Item
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PERR	NRC Public Electronic Reading Room
SIRW	Safety Injection Refueling Water
SIS	Safety Injection System

LIST OF DOCUMENTS REVIEWED

Procedures

- Palisades Nuclear Plant System Operating Procedure SOP-3, “Safety Injection and Shutdown Cooling System,” Revision 43, dtd April 12, 2000
- Palisades Nuclear Plant Emergency Operating Procedure EOP-4.0, “Loss of Coolant Accident Recovery,” Revision 10, dtd February 26, 1999
- EOP-1.0, Revision 9, “Standard Post-Trip Actions”
- EOP-4.0, Loss of Coolant Accident Recovery Basis, Revision 9, February 26, 1999
- EOP-8.0, Revision 11, “LOOP/Forced Circulation Recovery”
- EOP Setpoint Basis
- RE-63B, “Service Test - Battery No. ED-02,” completed October 25, 1999
- RE-83A, “Service Test- Battery No. ED-01,” completed October 17, 1999
- RI-18, “SIRW Tank Temperature Indicator Calibration Procedure,” Revision 12, completed February 7, 2000
- RI-38, “SIRW Tank Level Instrument Calibration,” Revision 11, completed November 5, 1999
- SPS-E-1, “2400 Volt and 4160 Volt Allis Chalmers Circuit Breaker Auxiliary Switch Adjustments,” Revision 9, February 27, 1998
- SPS-E-4, “Maintenance for 4160/2400 Volt Switchgear,” Revision 8, February 27, 1998
- SPS-E-10, “Maintenance for 4160/2400 Volt Switchgear Siemens MA-250C1 and MA-350C1 Breakers,” Revision 0, February 27, 1998
- WI-SPS-E-02, “Insulation Resistance Testing of Electrical Equipment,” Revision 1, November 5, 1997
- MSI-1-12, “Maintaining Environmental Qualification for Rosemount Transmitters,” Revision 3, September 10, 1996
- EM-09-02, Inservice Testing of Plant Valves, Revision 20, August 28, 1998
- EM-09-04, Inservice Testing of Selected Safety-Related Pumps, Revision 19, May 4, 1999
- APR-7, Pg. 17-19, Alarm and Response Procedure - Auxiliary Systems Scheme EK-11, Revision 60
- EM-27, Engineering Manual Procedure - Lubrication Analysis and Monitoring, Revision 3
- 1.09, Self-Assessment Report - Review of Palisades Lubrication Analysis Program Basis, Sample Frequencies, Scope, Sampling Techniques and Training
- T-255, Special Test Procedure - SIS Detection Circuitry Test, April 27, 1998
- 3.16, Industry Experience Review Program, February 18, 2000
- 5.04, Control of Installed Plant Instrumentation (IPI), March 15, 1999
- 9.11, Engineering Analysis, Revision 10
- RI-7, Tech Spec Surveillance Test Procedure Basis Document RI-7 “Low Pressure SIS Initiation Logic,” December 7, 1994
- RI-7, Low Pressure SIS Initiation Logic Surveillance, Performed, November 3, 1999
- RI-68, Containment Water Level and Sump Level Monitor Calibration - Basis Document, April 14, 1993
- RI-14, SIRW Tank Level Switch Interlock Test, November 9, 1999
- RT-8D, Engineered Safeguards Systems Right Channel Test, October 29, 1999
- ARP-7, Revision 60, “Auxiliary Systems Scheme EK-11 (C-13)”
- ONP-7.1, Revision 13, “Loss of Instrument Air,” October 26, 1999

- RO-119, Revision 7, Inservice Testing of Engineered Safeguards Valves CV-3027 and CV-3056
- RT-71L, Revision 8, CTS 6.5.2 Pressure Test of ESS Pump Suction Piping
- RT-71L, Basis for TS Pressure Test of ESS Pump Suction Piping
- T-205-A, Revision 1, "East Engineering Safeguards High Pressure Air System Performance Verification"
- T-205-B, Revision 2, "West Engineering Safeguards High Pressure Air System Performance Verification"
- T-278-9C, Revision 1, HPA CK-CA476 Seat Leakage Test
- ESS-M-8, Revision 17, “Periodic Preventive Maintenance of RAS Valves”
- SOP-20, Revision 15, “High Pressure Control Air System,” Performed April 14, 2000

Drawings

- VEN-M107-SH2246-Revision 3, 03378, Sheet 2 of 4, Stress Isometric, H.P. Safety Injection Pump Discharge, Revision 3, dtd November 2, 1992
- VEN-M107-SH2283, 03319, Sheet 6, Stress Isometric, Safety Injection, Ctmt. Spray, and Shutdown Cooling System, Revision 6, dtd November 6, 1995
- VEN-M107-SH3925, CC6-H203.2, Revision 0, dtd November 7, 1992
- M74, Sh. 1, Revision 12 - Underground Piping, Reactor Building
- M201, Sht. No. 1, Revision 67 - P&ID Primary Coolant System
- M203, Sh. A, Revision 5, System Diagram, Safety Injection, Containment Spray & Shutdown Cooling System
- M203, Sht. No. 1, Revision 44 - P&ID Safety Injection, Containment Spray, and Shutdown Cooling System
- M203, Sht. No. 2, Revision 18 - P&ID Safety Injection, Containment Spray, and Shutdown Cooling System
- M204, Sht. No. A, Revision 6 - System Diagram, Safety Injection, Containment Spray & Shutdown Cooling System
- M204, Sht. No. 1, Revision 70 - P&ID Safety Injection, Containment Spray and Shutdown Cooling System
- M204, Sht. No. 1A, Revision 25 - P&ID Safety Injection, Containment Spray and Shutdown Cooling System
- M204, Sht. No. 1B, Revision 30 - P&ID Safety Injection, Containment Spray
- M225, Sheet 1, Revision 42, Sheet 2, Revision 31, P&ID for HPA Operated Valves
- M-398, Sheet 18, Revision 5 - Level Setting Diagram, Safety Inj. & Refueling Water Tank T-58
- M-398, Sheet 30, Revision 2 - Level Setting Diagram, Containment Level Instrumentation
- M-510, Revision 2 - Guard Pipes for Recirculation from Containment Sump
- 03319, Sh. 1, Revision 8 - Safety Injection, Ctmt. Spray & Shutdown Cooling System
- 03319, Sh. 4, Revision 8 - Safety Injection, Ctmt. Spray & Shutdown Cooling System
- VEN-M107-Sh. 2454, Revision 5 - Stress Isometric, Long Term Cooling Modification
- VEN-M-107, Sht. No 2455, Revision 5 - Stress Isometric, Long Term Cooling Modification
- VEN-95073, Sh. 71, Revision 9 - Vertical and Horizontal Tendons Schematic Layout at Wall Penetrations Between Buttress CL's B&C
- E17 Sh.4, Logic Diagram - Safety Injection Actuation, June 24, 1998

- WD 950, Sh. 1 (E-1 SH.1), Single Line Meter & Relay Diagram - 480V MCC, April 20, 1999
- WD 950, Sh. 4 (E-3, Sh-1), Single Line Meter & Relay Diagram 2400V System, November 3, 1999
- WD 950, Sh. 12 & 12A (E-S, Sh1), Single Line Meter & Relay Diagram 480V MCCs, December 1, 1999
- E249, Schematic Diagram - High Pressure Safety Injection Pumps P66A&B, August 1, 1995
- E605, Sh. 47, Connection Diagram - 2400V Swgr #ID Unit 207, November 18, 1992
- VEN-M201, Sh. 22, Wiring diagrams - Section C03R, June 3, 1999
- VEN-M201, Sh. 38, Wiring Diagram - Console Section C13-IL and C13-IR (Partial), May 20, 1998
- VEN-M201, Sh. 41, Wiring Diagram - Term. Blocks & Misc. Equip. Section C13-1R, June 16, 1999
- VEN-M201, Sh. 43, Sub Panel for Vertical Section C13R (C13-5), May 4, 1998
- VEN E5, Sh. 64, Wiring Diagram - 2400V Swgr Bus ID, Bkr 152-207, December 1, 1992
- E-93, Sh. 1 & 1A, Schematic Diagrams - Safety Injection Line Flow Instrumentation, December 12, 1993
- E87, Schematic Diagram - Level Ind & Alarm Instr, September 21, 1993
- E93, Sh. 1 &1A, Schematic Diagram - Safety Injection Line Flow Inst, December 12, 1993

Reports

- NRC Inspection Report No. 50-255/86029, “Safety System Functional Inspection,” dtd December 22, 1986
- NRC Inspection Report No. 50-255/99009, dtd September 3, 1999

Calculations/Analyses

- EA-SP-03319-01, Engineering Analysis, Piping Stress Analysis for Safety Injection, Containment Spray & Shutdown Cooling System, Revision 1, dtd August 23, 1995
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