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10 CFR 50.55a

U S Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
Renewed License Nos. DPR-42 and DPR-60

Supplement to 10 CFR 50.55a Requests (RR) 1-RR-5-2 and 2-RR-5-2 (TACs MF4835 and MF4836) Associated with Prairie Island Nuclear Generating Plant (PINGP) Fifth Ten-Year Interval Inservice Inspection (ISI) Program

By letter dated September 15, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14258A073), Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy (hereafter "NSPM"), submitted for NRC approval 10 CFR 50.55a Requests associated with the fifth ten-year interval for the Prairie Island Nuclear Generating Plant (PINGP), Units 1 and 2, Inservice Inspection (ISI) Program. By letter dated October 20, 2014 (ML14293A458), NSPM provided supplemental information for 10 CFR 50.55a Requests 1-RR-5-2 and 2-RR-5-2. By email dated December 8, 2014 (ML14343A001), the NRC requested additional information (RAIs) to complete the review of these requests. The enclosure to this letter provides the responses to the NRC Staff RAIs for 1-RR-5-2 and 2-RR-5-2.

If there are any questions or if additional information is needed, please contact Mr. Dale Vincent, P.E., at 651-267-1736.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

Kevin Davison

Kevin Davison
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (1)

A047
NRR

cc: Administrator, Region III, USNRC
Project Manager, PINGP, USNRC
Resident Inspector, PINGP, USNRC

Enclosure

Supplement to 10 CFR 50.55a Requests (RR) 1-RR-5-2 and 2-RR-5-2 Associated with Prairie Island Nuclear Generating Plant (PINGP) Fifth Ten-Year Interval Inservice Inspection (ISI) Program

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NRC RAI RR-2-1(a):

Provide a piping and instrumentation diagram (P&ID) and piping isometrics that contain the cooling water system (CL). A hand-sketch of the subject piping would also assist the NRC staff to understand the pipe boundaries and proposed pressure tests. On these drawings, please identify the boundary of CL lines 30-CL-20 and 30-CL-23; the direction of the coolant flow so that the suction pipe and discharge pipe are identified; the pipe segments that are buried under buildings and the pipe segments that are buried in the yard (outside of the buildings); and the locations of flow meters and pressure sensors.

NSPM response:

The requested information is shown on NF-39216-1 (Flow Diagram Cooling Water – Screenhouse Unit 1 & Unit 2), NF-39216-2 (Flow Diagram Cooling Water – Turbine Building Unit 1), NF-39217-1 (Flow Diagram Cooling Water – Turbine Building Unit 2) and a Simplified CL System Diagram provided as Attachments 1, 2, 3, and 4, respectively, to this Enclosure.

The boundary of line 30-CL-20 is shown on NF-39216-1 and NF-39316-2 with a red line. The boundary of 30-CL-23 is shown on NF-39216-1 and NF-39217-1 with a red line. The direction of the cooling flow is indicated on the P&ID with arrows. Pressure indication and flow meters are notated on NF-39216-1, NF-39216-2, and NF-39217-1 with red rectangles. The pipe segments that are buried are shown on Figure 1 below.

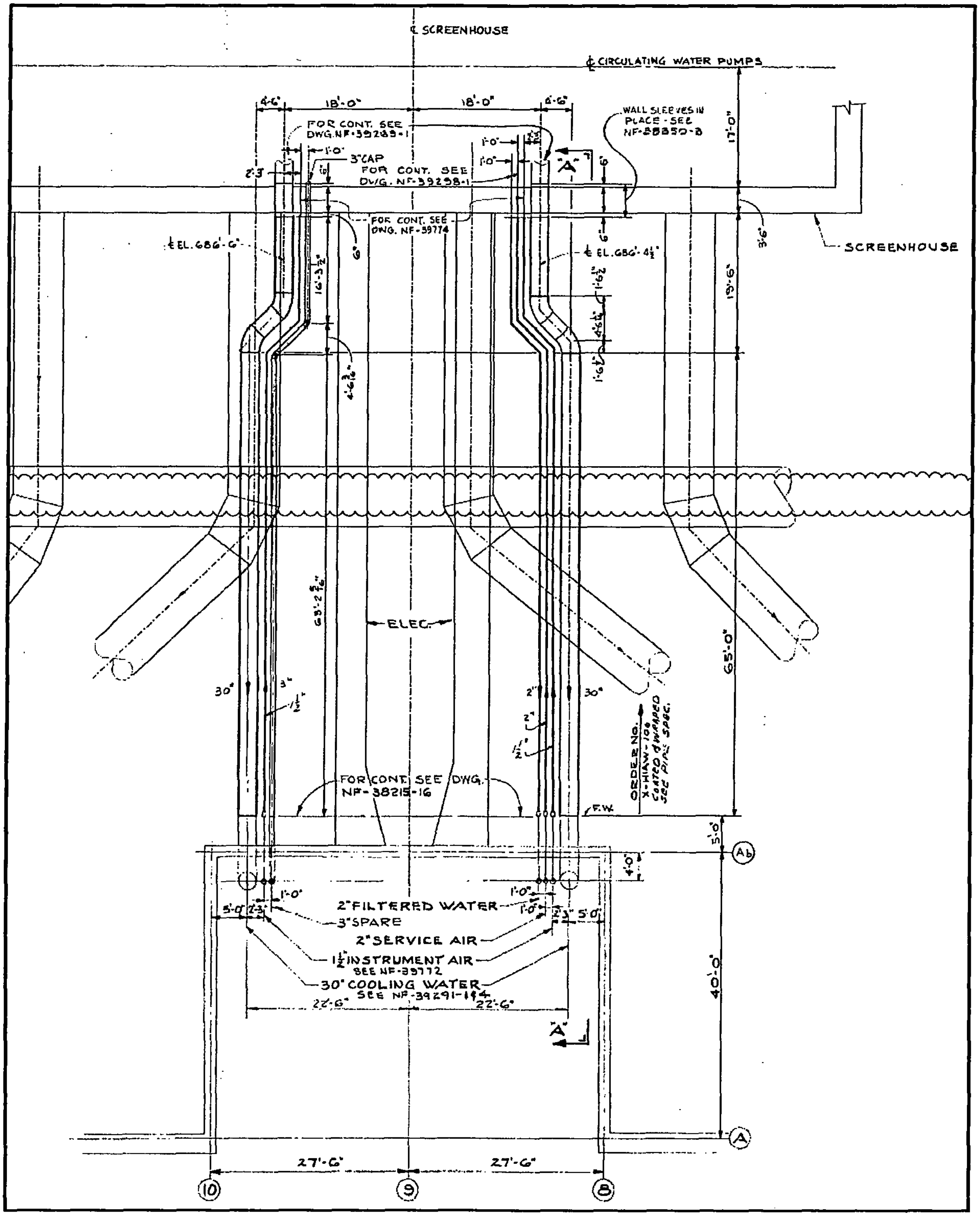


Figure 1 (NF-39262-2)

NRC RAI RR-2-1(b):

Discuss approximate feet of the Line 30-CL-20 and Line 30-CL-23 that are:

(1) buried in the yard (outside of the buildings);
(2) buried under various buildings (i.e., administration building, screen house, and turbine building) where the pipe segments are inaccessible for visual examinations; and
(3) above ground

NSPM Response:

(1) Approximately 67 feet for each 30-CL-20 and 30-CL-23 is buried outside of buildings.

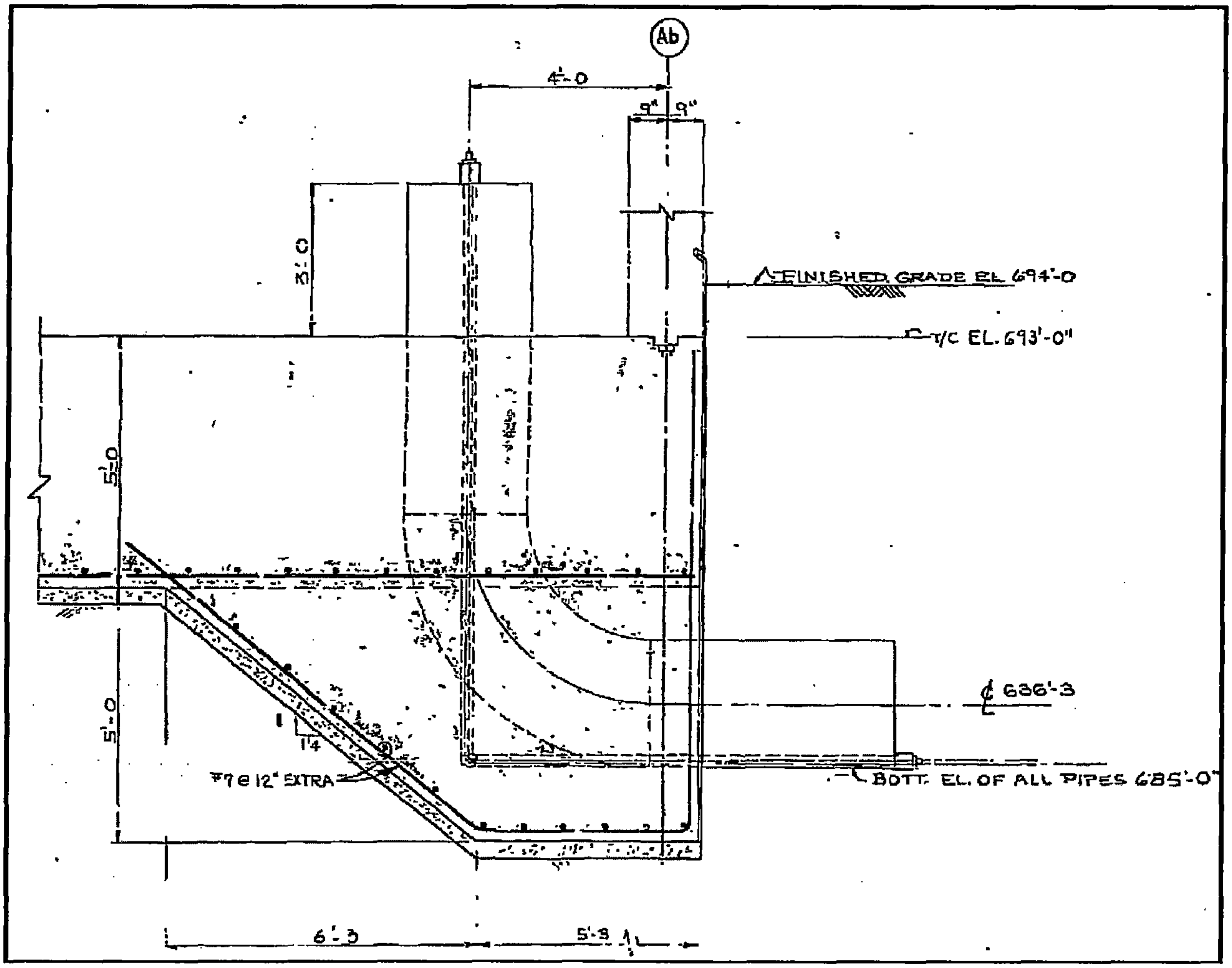


Figure 2 (NF-38215-16)

(2) The two CL headers penetrate the Screenhouse horizontally through pipe sleeves in the 3 feet 6 inches thick vertical concrete wall into the soil in the yard. The headers go south for approximately 67 feet until they go under the Administration Building. They transverse under the Administration Building for approximately 22 feet and under the Turbine Building an additional 4 feet where they elbow vertically and come

up through floor penetrations in the Turbine building near Column Row Ab (see Figure 2 from drawing NF-38215-16 above). Approximately 26 feet of each CL header are under the Administration and Turbine Buildings with an additional 3.5 feet in the Screenhouse wall penetrations. Therefore, approximately 29.5 feet of each header is buried under buildings and not readily accessible.

(3) For both lines there are approximately 98 feet in the Turbine Building and approximately 10 feet in the Screenhouse that are above ground and outside the scope of this request. Accessible portions of these lines will continue to be pressure tested as required by code.

NRC RAI RR-2-1(c):

How many feet of the buried pipe covered by this relief request were replaced in 1992? Confirm that all pipe segments buried in the yard (i.e., outside of the buildings) were replaced but the pipe segments buried under the buildings were not replaced in 1992.

NSPM Response:

Modification 92Y170 replaced most of the buried piping (approximately 75 feet of each 30 inch line), with the exception of where the piping penetrates or is cast into concrete and the last 8 feet of piping before the piping enters the foundation of the Administration Building (Column Row Ab). Piping penetrations at the Screenhouse, the piping inside the foundation of the Administration Building (and the 8 feet extension from the foundation) are original piping that had weld overlays from the inside diameter (ID) to restore pipe wall thickness. Once the weld overlays on the original piping were complete, the original piping and the new piping was internally coated with an epoxy material.

NRC RAI RR-2-1(d):

How many feet below the ground surface the piping is buried?

NSPM Response:

The centerline of the pipe at the lowest point is at 686'-3", and the grade elevation is 694'-0" which equates to a depth of 7'-9".

NRC RAI RR-2-1(e):

Is the CL system operated continuously (i.e., the pumps running and coolant flows through the inside of the subject piping) during normal operation and shutdown?

NSPM Response:

Yes for normal operation and yes for shutdown. The CL system is operated continuously, per USAR Section 10.4.1.2 Cooling Water System Description:

> A ring header which is shared by Units 1 and 2 can be isolated automatically to provide two redundant independent sources of cooling water for all essential services. One-half of essential services for each Unit are supplied from each side of the isolable loop. Each side of the loop is designed to supply the needs for all essential services for both Units. Thus, failure of one side of the loop still provides for the operation of all equipment required for the safe shutdown of both Units.

Normal operation utilizes two horizontal pumps with the vertical motor-driven pump as a standby.

NRC RAI RR-2-1(f):

Provide the normal operating pressure and temperature of the subject pipes when the pumps are running.

NSPM Response:

Temperature typically ranges from approximately 70 °F to 83 °F in summer months and 50 °F to 60 °F in winter months. Header pressure is typically approximately 95 to 110 psi.

NRC RAI RR-2-1(g):

The NRC staff understands that a flow meter is located at the vicinity of the pump discharge nozzle. Discuss whether a flow meter is located at the other end of discharge pipe such that if there is a leak between the pump discharge nozzle and the pipe end, the differences in reading between these two flow meters would indicate the leak rate. Similarly, discuss whether a flow meter is located at the pump suction nozzle and at the suction pipe intake opening.

NSPM Response:

There are no flow meters installed at the pump discharge nozzles, pump suctions, or suction pipe intake openings.

There is one flow meter for each CL header (FE-27185 and FE-27186 as shown on drawings NF-39216-2 (Attachment 2) and NF-39217-1 (Attachment 3)), located in the Turbine Building downstream of the buried sections of pipe and prior to entering the Auxiliary Building. Due to the location of the Turbine Building flow meters downstream of the buried piping, a decrease in pump head could indicate leakage between the pump discharge and these flow meters.

The 12 and 22 diesel-driven cooling water pump (DDCLP) and 121 motor-driven cooling water pump (MDCLP) are tested quarterly per Inservice Testing (IST) program requirements, during which time the pump head/performance on the pump curve is evaluated. A leak in the underground portion of the CL header would result in reduced pump performance.

NRC RAI RR-2-1(h):

Discuss whether the diesel driven CL pumps and motor-driven CL pumps are centrifugal pumps.

NSPM Response:

The 12 and 22 DDCLPs are single speed, single stage centrifugal pumps. The vertical 121 MDCLP is also a single speed, single stage centrifugal pump. The horizontal motor-driven non-safeguards pumps (11 CLP and 22 CLP) are single speed, dual volute, centrifugal pumps.

NRC RAI RR-2-1(i):

Discuss whether the relief request covers only the buried portion of the CL piping on the discharge side of the CL pumps and not on the suction side of the CL pumps.

NSPM Response:

The relief request covers only the buried portions of the CL piping on the discharge side of the CL pumps. No American Society of Mechanical Engineers (ASME) Section XI code class CL suction piping exists in that the safeguards pumps are submerged in, and take suction from, the Safeguards Intake Bay. The non-safeguards pumps have short sections of suction piping which are outside the scope of the relief request.

NRC RAI RR-2-2(a):

The relief request states that due to the location of the flow rate instruments (downstream of the buried piping), a decrease in pump head during testing may also indicate leakage from the CL system between the pump discharge and flow meter in the turbine building.

(a) Clarify what is significance of a flow meter located in the turbine building in terms of detecting potential pipe leakage and where exactly is the flow meter located at the downstream of the buried piping. As requested in RAI-RR-2-1 (a), a diagram showing the locations of the flow meter along the CL piping would assist in clarifying this question.

NSPM Response:

Flow element FE-27185 is located at elevation 710'6", at approximately plant Column/Row Ab-8. Flow element FE-27186 is at the same elevation and similar location (Ab-10). The 12, 22, and 121 CL safeguards pumps and associated discharge pressure indication are located in the Plant Screenhouse, and connected to the Turbine Building through buried piping. The flow elements are downstream of the buried piping, inside the Turbine Building (NF-39216-1, NF-39216-2 and NF-39217-1 (Attachments 1, 2 and 3 respectively)).

The significance of the flow meters in the Turbine Building in terms of detecting potential pipe leakage is due to their use in coordination with the quarterly IST program testing of the 12, 22, and 121 CL pumps. During the IST program tests, the flow and pressure of the CL pumps are plotted in order to evaluate pump head and pump performance. If pump performance (head vs flow) were to fall significantly below the design pump curve, this would indicate either pump degradation or leakage between the pump discharge and the flow meter in the Turbine Building. The location of the flow meters in the Turbine Building, with buried piping between the flow meters and the pump discharge, may indicate a need to evaluate the pipe for leakage if pump performance decreases. P&IDs have been included in RR-2-1(a) response material with locations of the flow meters notated.

NRC RAI RR-2-2(b):

It appears that a leakage in the pipe on the pump discharge side can be detected by a decrease in pump head. Discuss how the leakage in the pipe on the pump suction side can be detected.

NSPM Response:

PINGP does not have suction side piping on the safeguards CL pumps. The safeguards CL pumps are submerged in the CL Safeguards Intake Bay and take suction directly from the bay. The non-safeguards pumps have short sections of exposed pipe which is outside the scope of this request.

NRC RAI RR-2-2(c):

The decrease in pump head may not be accurate to determine the leak rate because of the measurement uncertainty in the flow meter located at the pump discharge nozzle. To solve this problem, the licensee could install a portable, temporary flow meter at the end point of the discharge pipe (i.e., the entrance to equipment). The difference in reading between the flow meter at the discharge nozzle and the portable flow meter located at the pipe end point would provide more accurate leak rate than that of using the pump curve and a decrease in pump head. However, the licensee stated that sufficient lengths of accessible straight pipe for reliable use of ultrasonic flow meters do not exist. Discuss whether portable flow meters could be installed at the pipe that is on the suction side of the pump to detect leakage on the suction pipe.

NSPM Response:

The only flow meters associated with the CL pumps are downstream of the buried piping approximately 110 feet from the CL pumps. Portable flow meters could not be installed on the suction side of the safeguards pumps because all three pumps take suction directly from the Safeguards Intake Bay below the plant Screenhouse.

NRC RAI RR-2-2(d):

Discuss whether a ground penetrating radar or guided wave ultrasonic examination would be used as part of investigation procedures to detect the exact location of the leak. If no, provide justification.

NSPM Response:

NSPM would likely not use either ground penetrating radar (GPR) or guided wave ultrasonic examination as a means to detect the location of a leak. NSPM does not have confidence in the ability of Ground Penetrating Radar (GPR) to determine the exact leak location on piping. A recent article published by the Multidisciplinary Digital Publishing Institute (MDPI.com) entitled *GPR-Based Water Leak Models in Water Distribution Systems* states:

> Identifying leaks by GPR images is not an easy task and requires a high level of expertise by the operator. Added complications include the complex spatial arrangement of many networks, along with the steady growth in the supply infrastructure of cities. These aspects greatly increase the difficulty in using and interpreting data obtained with GPR in detecting leaks and analyzing the results, thus reducing the potential for solving problems and increasing the need for highly qualified personnel.

Because of 45° or 90° elbows immediately before or after where the piping penetrates building walls or foundations, the piping geometry is not conducive to guided wave technology. Since the piping runs in between the Screenhouse and the Administration Building are relatively short and approximately 7 feet deep, the preferred methodology for determining the exact location of a leak is by excavation coupled with use of GPR to narrow down the excavation location.

NRC RAI RR-2-3(a):

Provide the normal flow rate in the CL piping.

NSPM Response:

Normal flow rate in the CL headers, based on data from the six month period of 6/18/14 to 12/18/14, ranges from approximately 9,000 to 12,000 gpm for each train in summer months with both units online, to approximately 7,000 to 9,000 gpm for each train in winter months with both units online. Values for the single header below 5,000 gpm were observed during the 2014 Unit 1 refueling outage when much of the header was isolated, and does not represent normal header flowrates.

NRC RAI RR-2-3(b):

What would be the flow rate that would cause the CL system to be declared inoperable?

NSPM Response:

There is no defined flow rate that would cause the CL system to be declared inoperable. Technical Specification (TS) 3.7.8 requires "Two CL trains shall be OPERABLE." The required actions with one CL supply header inoperable are to "Verify vertical motor driven CL pump OPERABLE within 4 hours and Verify opposite train diesel driven CL pump OPERABLE within 4 hours and Restore CL supply header to OPERABLE status within 72 hours". Plant shutdown is required within 36 hours if these action and times are not met.

NRC RAI RR-2-3(c):

Discuss the lowest leak rate that can be detected by the proposed method (i.e., using the decrease in the pump head and the pump curve to obtain the leak rate).

NSPM Response:

A review of recent pump tests show the three safeguards CL pumps typically perform within plus 1% to minus 3% of the design pump curve at flows between 9,500 and 11,000 gpm (IST Pump Test). A decrease in pump performance to 95% could indicate either a degraded pump or possible leakage. The estimated difference in flow (potential leakage) between 100% and 95% of the pump curves at 10,000 gpm is 1,100 gpm. Quarterly pump testing is not considered the primary means of leak detection, but rather provides indication that flow is not impaired. As the CL headers are in continuous service, significant leakage is expected to be detected by VT-2 inspection in accordance with Code Case N-776, Operator rounds or observation by site personnel.

NRC RAI RR-2-3(d):

Discuss the minimum leak rate that the visual examination of the ground surface could identify. At that leak rate, discuss whether the CL system would still be considered as operable.

NSPM Response:

Since the CL headers are in continuous service, leakage in the range of 300 to 500 gpm is assumed to result in abnormal wetness, sinkhole, or detectable leakage at the Screenhouse or Turbine Building pipe penetrations. There is no defined minimum flow rate at which the CL system is considered inoperable. A leak of approximately 1,100 gpm would result in a reduction of 5% on the pump performance curve. The pump would still be above the 93% IST action level. If pump test results are in the Action Range per IST procedure, the pump is declared inoperable and plant TS Action statements are entered as applicable. The pump then remains inoperable until the cause of the deviation is determined and the condition corrected, or an analysis of the pump is performed and new reference values are established in accordance with ISTB-6200(c). As such, it is expected that leakage would be detected well before operability was challenged.

NRC RAI RR-2-3(e):

Discuss whether the control room panel has alarms that would indicate the impaired flow in the CL piping such that the operators would take corrective actions. If no such alarm exists in the control room, how a pipe leak would be discovered because the visual examinations of the ground surface is performed only during the quarterly pump testing and during refueling outages.

NSPM Response:

A buried piping leak is likely to be discovered through Main Control Room alarms, daily Operator rounds checks per plant procedures, visual examinations in accordance with Code Case N-776, or observation by site personnel. Since the cooling water headers are in continuous service, the VT-2 examinations will be done as conditions permit independent of quarterly pump testing.

The following Main Control Room alarms could be indicative of impaired flow or a cooling water header leak:

A. 47020-0104, LOOP A COOLING WATER HI FLOW
B. 47020-0105, LOOP B COOLING WATER HI FLOW
C. 47020-0204, LOOP A COOLING WATER LO PRESS
D. 47020-0205, LOOP B COOLING WATER LO PRESS
E. 47520-0103, LOOP A COOLING WATER HI FLOW
F. 47520-0104, LOOP B COOLING WATER HI FLOW
G. 47520-0203, LOOP A COOLING WATER LO PRESS
H. 47520-0204, LOOP B COOLING WATER LO PRESS

Upon receipt of an alarm, the alarm response procedure directs Operators to enter into an abnormal operating procedure for loss of CL pumping capacity or supply header without safety injection (SI), loss of CL pumping capacity or supply header with SI, or CL leakage outside containment, depending on plant status.

The abnormal operating procedures for loss of CL pumping capacity or supply header direct Operator response to low header pressure, including evaluating CL pump status, separating the CL headers and evaluating CL pressure, evaluating CL header flows, and tripping the reactor as required. The procedures also direct recovery of a depressurized CL header by isolating loads from the affected header.

A separate abnormal operating procedure describes symptoms and the actions to be taken to isolate a leak in the cooling water header or branch connections.

Each of these procedures has a step to "Notify the turbine and auxiliary building operators of the loss of cooling water header or capacity and direct them to investigate" which would include checking outdoors for evidence of buried piping leakage and using procedural guidance for potential piping failure locations.

Visual examinations of the ground surface are performed during the quarterly pump testing, during refueling outages, as well as through general equipment/area monitoring at least daily per procedure requirements.

NRC RAI RR-2-4(a):

Confirm that a visual VT-2 examination of the ground surface areas will be examined during the quarterly pump tests.

NSPM Response:

Since the cooling water headers are in continuous service, the VT-2 examinations will be done as conditions permit independent of quarterly pump testing. The frequency of the VT-2 examination is not specified in Code Case N-776. NSPM proposes to perform this examination on a refueling cycle basis. Based on current fuel cycles of less than two years on each unit, examination is expected to be performed approximately annually. In addition, examinations will be performed when conditions are conducive to detection of abnormal wetness. For example, examinations will be performed when the ground is generally dry.

NRC RAI RR-2-4(b):

For the pipe segments that are buried under buildings and cannot be inspected by any means, discuss how the structural integrity of those pipe segments can be ensured.

NSPM Response:

The structural integrity of the CL piping is monitored by the Underground Piping and Tanks Integrity (UPTI) Program for external corrosion and the Service Water/ Microbiological Induced Corrosion (SW/MIC) Program for internal corrosion. The UPTI program has implementing preventive maintenance procedures (PMs) that require direct inspections in each ten year period after the end of the original license. The SW/MIC program inspects a sample of the above ground piping each cycle, which may include piping that has been internally coated with epoxy. The combination of external and internal inspections on similar piping will enable the program owner to reasonably infer the condition of piping which may not be readily accessible. Ongoing preventative measures for both programs also ensure the structural integrity of the piping: impressed current cathodic protection as monitored by PMs, and chlorination of the CL system.

NRC RAI RR-2-4(c):

The decrease in pump head could identify the leak in the piping but that method could not identify the exact location of the leak. The pipe buried under the building is inaccessible for any examinations. Therefore, if the pipe buried under the buildings leaks, how the leak could be identified?

NSPM Response:

The sections of pipe under a building are approximately 29.5 feet of each header under the Administration and Turbine Buildings (see response to RAI RR-2-1(b) above). Leakage under the building would likely be detected by wetness on the floor or around floor penetrations.

NRC RAI RR-2-4(d):

If the pipe segments buried under the buildings leak large quantity of fluid, discuss whether soil disintegration under the buildings would affect the foundation of the building.

NSPM Response:

For the portions of piping located under the Administration Building it is possible that undetected leakage would eventually undermine the foundation; which would likely result in settling and cracking of walls and floors.

For portions of piping located under the Turbine Building, the CL headers traverse under the building for approximately 4 feet, it is expected that leakage under the Turbine Building would be detected at the CL header floor penetrations prior to any significant damage to the Turbine Building foundation.

NRC RAI RR-2-5(a):

The licensee proposed to use American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Case N-776 to perform pressure tests as an alternative. ASME Code Case N-776, Paragraph (b)(1) states that a VT-2 visual examination shall be performed to identify leakage on ground surfaces in the vicinity of the buried components and in areas where leakage might be channeled or accumulated. Paragraph (b)(2) states that a test that determines the rate of pressure loss, a test that determines the change in flow between the ends of the buried components, or a test that confirms that flow during operation is not impaired shall be performed. Paragraph (b)(3) states that the Owner shall specify criteria for the examinations and tests of (b)(1) and (b)(2).

(a) Discuss the acceptance criteria for the VT-2 examination that will be performed in accordance with N-776(b)(1).

NSPM Response:

As required by the code case:

> A VT-2 visual examination shall be performed to identify evidence of leakage on ground surfaces in the vicinity of the buried components and in areas where leakage might be channeled or accumulated. The examination shall be performed after the component has been pressurized to system leakage test pressure for at least 24 hours. Portions of buried components where a VT-2 examination is impractical (e.g., component is buried beneath impermeable material or encased in concrete) are exempt from VT-2 examination.

The frequency of the VT-2 examination is not specified in the code case. NSPM proposes to perform this examination on a refueling cycle basis. Based on current fuel cycles of less than two years on each unit, VT-2 examination is expected to be performed approximately annually. In addition, examinations will be performed when conditions are conducive to detection of abnormal wetness. For example, examinations will be performed when the ground is generally dry. Acceptance criteria for the VT-2 is: no indication of abnormal wetness; or no unusual conditions in the examination area such as unexplained standing or flowing water, sink holes, or unusual wetness at exposed and accessible pipe penetrations.

NRC RAI RR-2-5(b):

Page 7 of the relief request states that "...[the licensee will] perform a test that confirms that flow during operation is not impaired on the buried portion of CL piping in conjunction with the quarterly testing of the CL pumps..." However, it appears that pages 6 and 7 of the relief request describe a test that uses the pump pressure loss to determine flow loss. Provide additional information on the test that confirms the flow is not impaired. That is, once the pump is determined not to be degraded, describe how a leakage, a leak rate and the exact leaking location can be determined.

NSPM Response:

During quarterly testing, pump pressure is measured at the pump discharge in the plant Screenhouse. Flow is measured downstream of the buried sections of pipe in the Turbine Building. Since impaired flow would be indicated by an abnormally low flow rate and high pump discharge pressure, IST program testing provides indication that flow is not impaired. Significant leakage would be indicated by measured flow being lower than indicated by the pump curve for the given pressure. If the pump is determined not to be degraded through engineering review, the leakage rate can be estimated from the pump curve by subtracting the measured flow from the expected flow at the observed discharge pressure. The location of the leakage would be indicated by abnormal ground wetness, and by excavation or other actions as needed to determine the exact location of leakage.

NRC RAI RR-2-5(c):

Discuss the acceptance criteria of the flow test.

NSPM Response:

The acceptance criteria for the flow test is based on the acceptance criteria of the CL quarterly pump tests per the requirements of the IST program. Each of the three safeguards CL pumps are tested quarterly to verify discharge flow and Total Developed Head (TDH) are within the pump operability curve. Each test procedure includes a family of pump curves depicting upper design limit, expected performance, an alert low, IST action low, and lower design limit.

If pump test results are in the Alert Range, then the testing frequency is doubled until the cause of the deviation is determined and the condition corrected. It is permissible for the test instruments involved to be recalibrated and the test rerun. Plant evaluations give the conditions under which a pump can operate while in the Alert Range.

If pump test results are in the Action Range, then the pump is declared inoperable and the appropriate TS Action Statements entered. The pump will remain inoperable until the cause of the deviation is determined and the condition corrected or an analysis of the pump is performed and new reference values are established in accordance with ISTB-6200(c).

Attachments to Enclosure

Supplement to 10 CFR 50.55a Requests (RR) 1-RR-5-2 and 2-RR-5-2 Associated with Prairie Island Nuclear Generating Plant (PINGP) Fifth Ten-Year Interval Inservice Inspection (ISI) Program

Attachment 1: NF-39216-1, Revision 87, "Flow Diagram Cooling Water – Screenhouse Unit 1 & Unit 2" (2 pages).

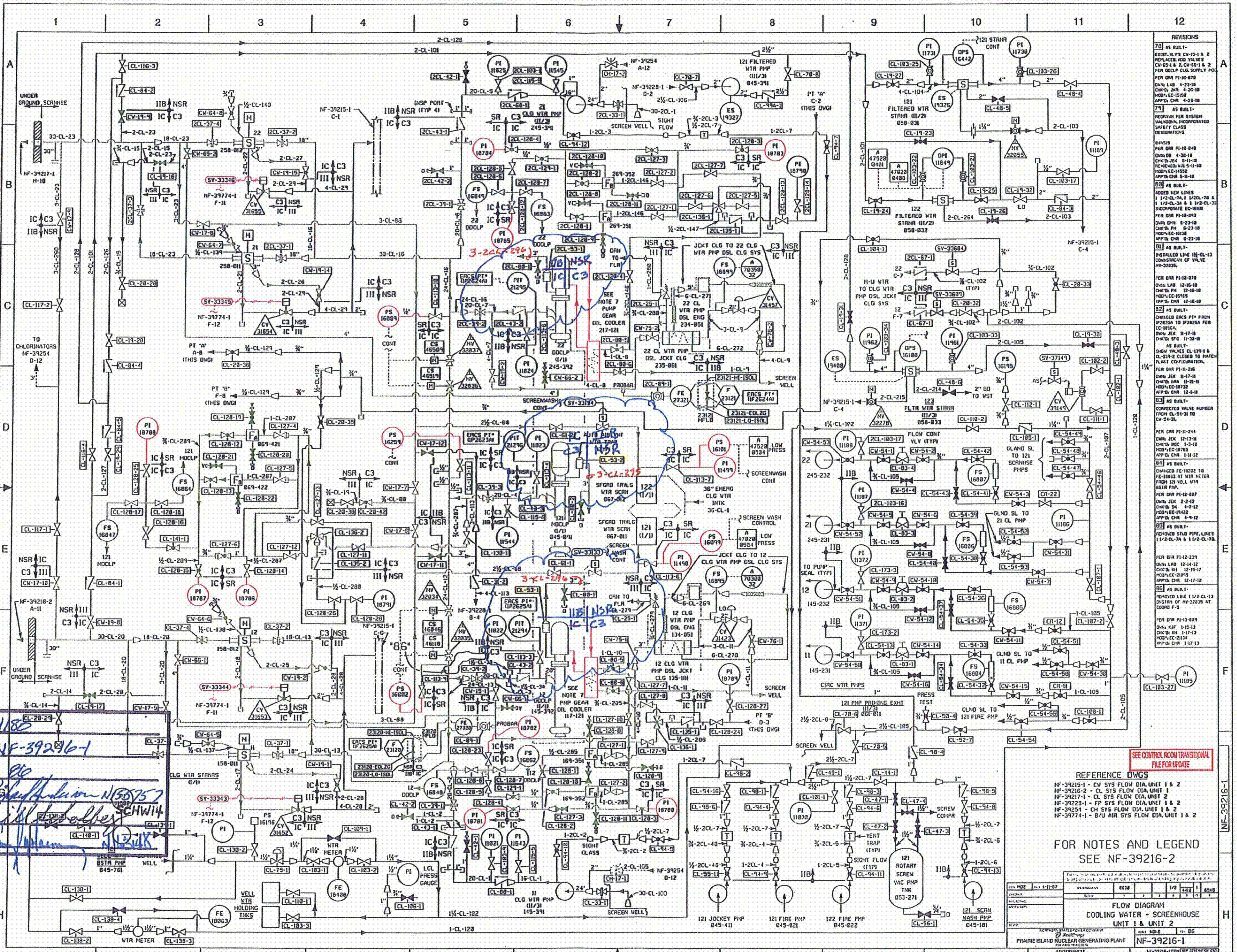
Attachment 2: NF-39216-2, Revision 80, "Flow Diagram Cooling Water – Turbine Building Unit 1".

Attachment 3: NF-39217-1, Revision 82, "Flow Diagram Cooling Water – Turbine Building Unit 2".

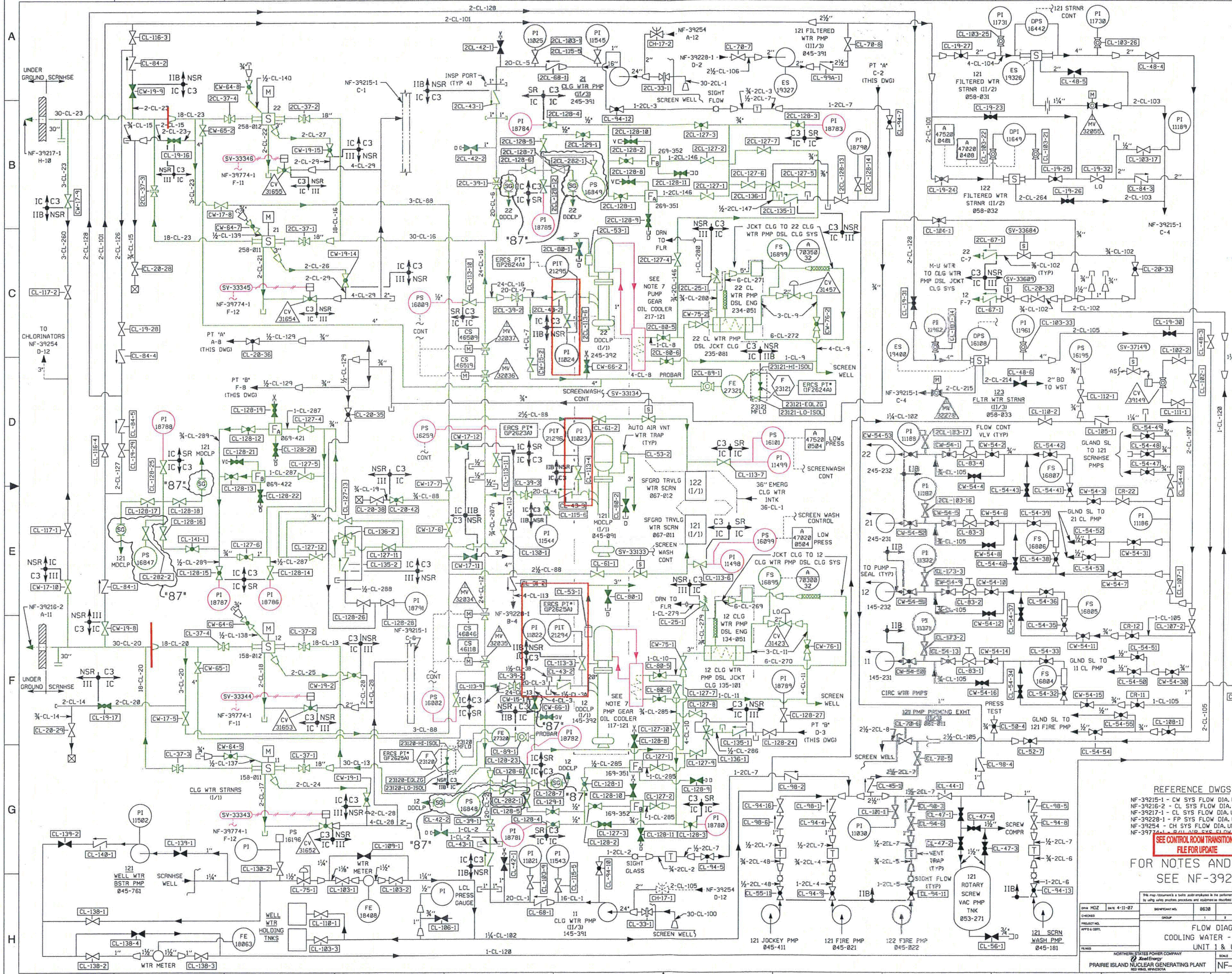
Attachment 4: C35 AOP1 Figure 1, Simplified Cooling Water System Flow Diagram, Revision 14.

5 pages follow

TRANSITIONAL FILE SUBMITTAL EC 24180



EC 24180
DWG NO NF-39216-1
DWG REV 86
PREPARER
REVIEWER
APPROVER



REVISIONS

79 AS BUILT-
REDRAWN PER SYSTEM WALKDOWN, INCORPORATED SAFETY CLASS DESIGNATIONS

04NS15
PER DRR PI-10-048
DWN: DB 4-30-10
CHK'D: JEK 5-11-10
REVIEWED: WJI 5-11-10
MOD#: EC-14552
APP'D: CMR 5-11-10

80 AS BUILT-
ADDED NEW LINES 1 1/2-CL-7A, 1 1/2CL-7B & 1 1/2-CL-3A & 1 1/2-CL-3B INCORPORATE EC-16110
PER DRR PI-10-093
DWN: DMN 6-23-10
CHK'D: PH 6-23-10
MOD#: EC-16136
APP'D: CMR 6-23-10

81 AS BUILT-
INSTALLED LINE 1½-CL-13 DOWNSTREAM OF VALVE MV-32035.
PER DRR PI-10-078
DWN: LAB 12-16-10
CHK'D: PH 12-16-10
MOD#: EC-15965
APP'D: CMR 12-16-10

82 AS BUILT-
CHANGED ERCS PT# FROM 1P2625A TO 1F2625A PER EC-18564.
DWN: JEK 11-17-11
CHK'D: SFG 11-30-11
AS BUILT-
SHOW VALVES CL-139-1 & CL-139-2 CLOSED TO MATCH PLANT CONFIGURATION.
PER DRR PI-11-216
DWN: JEK 11-17-11
CHK'D: NRA 11-21-11
MOD#: EC-18732
APP'D: CMR 12-1-11

83 AS BUILT-
CORRECTED VALVE NUMBER FROM CL-54-31 TO CW-54-31.
PER DRR PI-11-244
DWN: JEK 12-13-11
CHK'D: MGC 1-3-12
MOD#: EC-18785
APP'D: CMR 1-11-12

84 AS BUILT-
CHANGED FE-18202 TO FE-18063 AT WTR METER FROM 121 WELL WTR BSTR PMP.
PER DRR PI-12-007
DWN: JEK 2-2-12
CHK'D: SK 4-7-12
MOD#: EC-19422
APP'D: CMR 4-9-12

85 AS BUILT-
REMOVED STUB PIPE, LINES 1 1/2-CL-7A & 1 1/2-CL-7B.
PER DRR PI-12-239
DWN: LAB 12-14-12
CHK'D: KH 12-15-12
MOD#: EC-21095
APP'D: CMR 12-17-12

86 AS BUILT-
REMOVED LINE 1 1/2-CL-13 DNSTRM OF MV-32035 AT COORD F-5
PER DRR PI-13-009
DWN: KJF 1-15-13
CHK'D: KH 1-17-13
MOD#: EC-21134
APP'D: CMR 1-17-13

87 AS BUILT-
REPLACED FLOW SWITCHES 16847 & 16864, 16848 & 16862, 16849 & 16863 WITH SIGHT FLOW INDICATORS & PRESSURE SWITCHES 16847, 16848 AND 16849. REV'D VALVE CW-15-1 TO NC.
PER DRR PI-14-009
DWN: LAB 9-30-14
CHK'D: GTL 10-6-14
MOD#: EC-21558
APP'D: CMR 10-6-14

REFERENCE DWGS

NF-39215-1 - CW SYS FLOW DIA. UNIT 1 & 2
NF-39216-2 - CL SYS FLOW DIA. UNIT 1
NF-39217-1 - CL SYS FLOW DIA. UNIT 2
NF-39228-1 - FP SYS FLOW DIA. UNIT 1 & 2
NF-39254 - CH SYS FLOW DIA. UNIT 1 & 2
NF-39774-1 - B/U AIR SYS FLOW DIA. UNIT 1 & 2

SEE CONTROL ROOM TRANSITIONAL FILE FOR UPDATE

FOR NOTES AND LEGEND SEE NF-39216-2

SIGNIFICANT NO.	8630			1/2	4410	1	8548
GROUP	1	2	3	4	5	CL	6

DWN MDZ DATE 4-11-07
CHECKED
PROJECT NO.
APP'D & CERT.
FILMED

FLOW DIAGRAM
COOLING WATER - SCREENHOUSE
UNIT 1 & UNIT 2

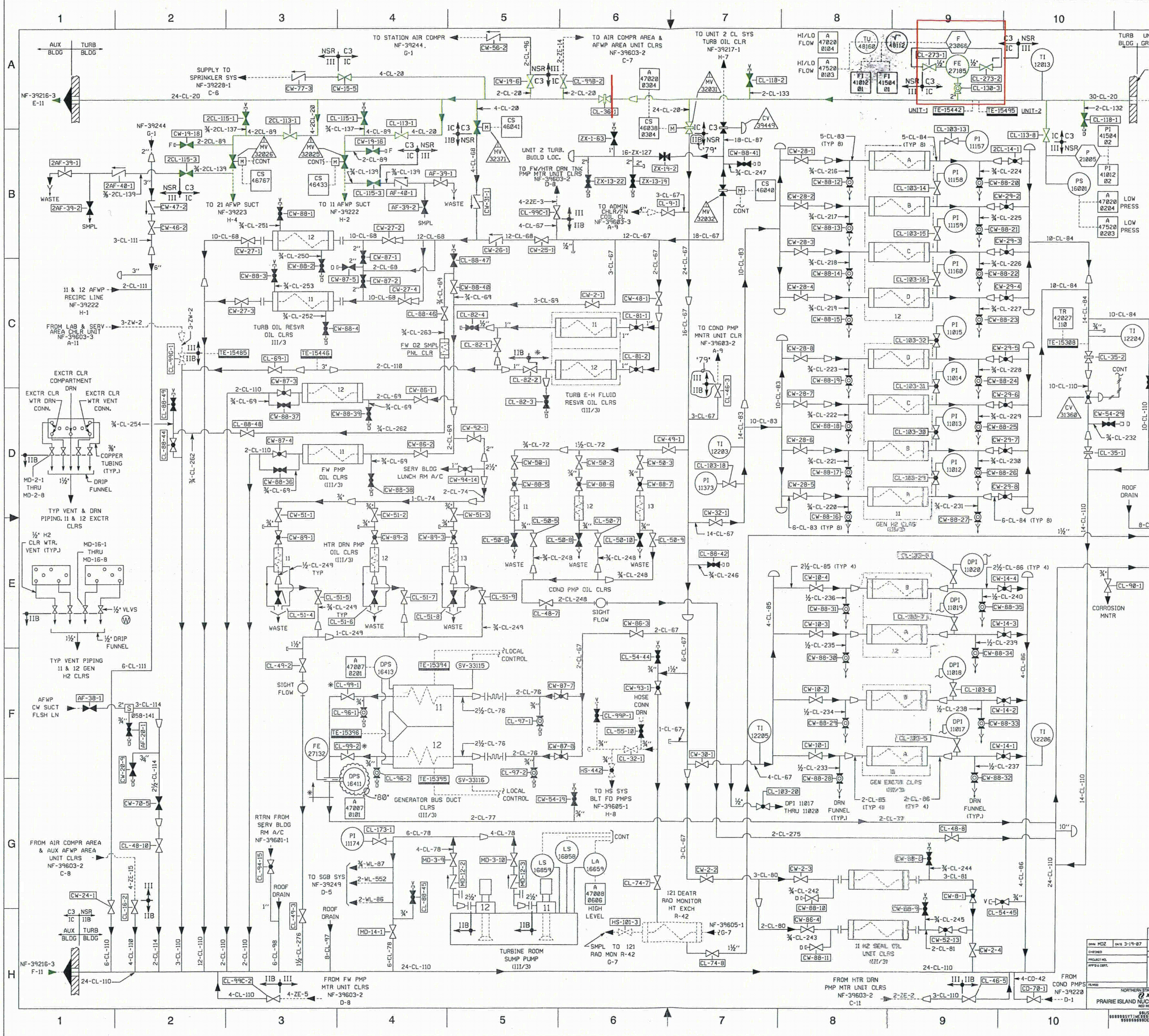
NORTHERN STATES POWER COMPANY
Xcel Energy
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
RED WING, MINNESOTA

SCALE NONE REV 87

NF-39216-1

$$USERNAME$$
$$$$$$SYTIME$$$$$$$$$$$$SYDATE$$$$$$
$$$$$$$$$DESIGNFIL$$$$$$$$$

NF-39216-1.DGN NSP GENERATION CAD



REVISIONS

77 AS BUILT-
ADDED NEW BORDER, NOTES, SAFETY CLASS LEGEND & SAFETY CLASS AS NOTED
04NS15
PER DRR P1-08-080
DWN: JK 10-31-08
CHK'D: DB 8-21-09
REVIEWED: WJI 8-24-09
MOD#: EC-13291
FILMED: 9-09

78 AS BUILT
REDRAWN PER SYSTEM WALKDOWN, INCORPORATED SAFETY CLASS DESIGNATIONS.
04NS15
PER DRR P1-10-048
DWN: DB 4-1-10
CHK'D: JEK 5-11-10
REVIEWED: WJI 5-11-10
MOD#: EC-14552
APP'D: CMR 5-11-10

79 AS BUILT-
REV'D DWG CONT GRID REF, QA TYPE FROM III TO IIB, VLV CL-46-4 FROM DOTTED TO SOLID. ADDED QA FLAGS.
04NS15
PER DRR P1-10-182
DWN: DB 10-14-10
CHK'D: JEK 11-24-10
MOD#: EC-17064
APP'D: CMR 11-29-10

80 AS BUILT-
CORRECTED 11/12 BUS DUCT CLG WTR OUTL DPS ID FROM 16413 TO 16411.
PER DRR P1-14-140
DWN: JEK 9-23-14
CHK'D: CMR 9-24-14
MOD#: EC-24524
APP'D: CMR 9-24-14

LEGEND

C2 NSR
IB III
CLASS BREAK
QA TYPE

- C1 - SAFETY-RELATED; ISI CLASS 1
- C2 - SAFETY-RELATED; ISI CLASS 2
- C3 - SAFETY-RELATED; ISI CLASS 3
- SR - SAFETY-RELATED FLUID BOUNDARY; NON-CODE CLASS
- NSR - NON-SAFETY-RELATED

IA, IB, IC, IIA, IIB & III DENOTES PIPING QA TYPES.

NOTES:

1. FOR VALVE POSITIONS SEE OPS MANUAL C PROCEDURE CHECKLIST.
2. UNLESS OTHERWISE SHOWN, CLASS BOUNDARIES STOP AT VENT AND DRAIN VALVES WITH DOWNSTREAM ITEMS (e.g., PIPE, CAPS, ETC.) CLASSED AS NON-SAFETY-RELATED.
3. DENOTES CATEGORY I VENTILATION ZONE
4. FOR SYMBOLS SEE XH-1-105, NF-39214.
5. I/1 DENOTES EQUIPMENT QA TYPE/ DESIGN CLASS.
6. ✳ DENOTES FURNISHED WITH EQUIPMENT
7. DDCLP GEAR CLR TUBE SIDE CLASS BOUNDARY C3 SHELL SIDE CLASS BOUNDARY SR.

REFERENCE DWGS

NF-39215-1 - CW SYS FLOW DIA UNIT 1 & 2
NF-39216-1 - CL SYS FLOW DIA UNIT 1
NF-39216-3 - CL SYS FLOW DIA UNIT 1
NF-39217-1 - CL SYS FLOW DIA UNIT 2
NF-39220 - CD SYS FLOW DIA UNIT 1 & 2
NF-39222 - AF SYS FLOW DIA UNIT 1
NF-39223 - AF SYS FLOW DIA UNIT 2
NF-39228-1 - FP SYS FLOW DIA UNIT 1 & 2
NF-39244 - SA SYS FLOW DIA UNIT 1 & 2
NF-39249 - WL SYS FLOW DIA UNIT 1 & 2
NF-39601-1 - ZB SYS FLOW DIA UNIT 1 & 2
NF-39603-2 - ZE SYS FLOW DIA UNIT 1 & 2
NF-39603-3 - ZH SYS FLOW DIA UNIT 1 & 2
NF-39605-1 - HS SYS FLOW DIA UNIT 1 & 2

DWN MDZ	DATE 3-19-07	SIGNIFICANT NO.	8630-			1	4400	1	8540
CHECKED		GROUP	1	2	3	4	5	CL	6
PROJECT NO.									
APP'D & CERT.									
FILMED									

FLOW DIAGRAM
COOLING WATER-TURBINE BLDG
UNIT 1

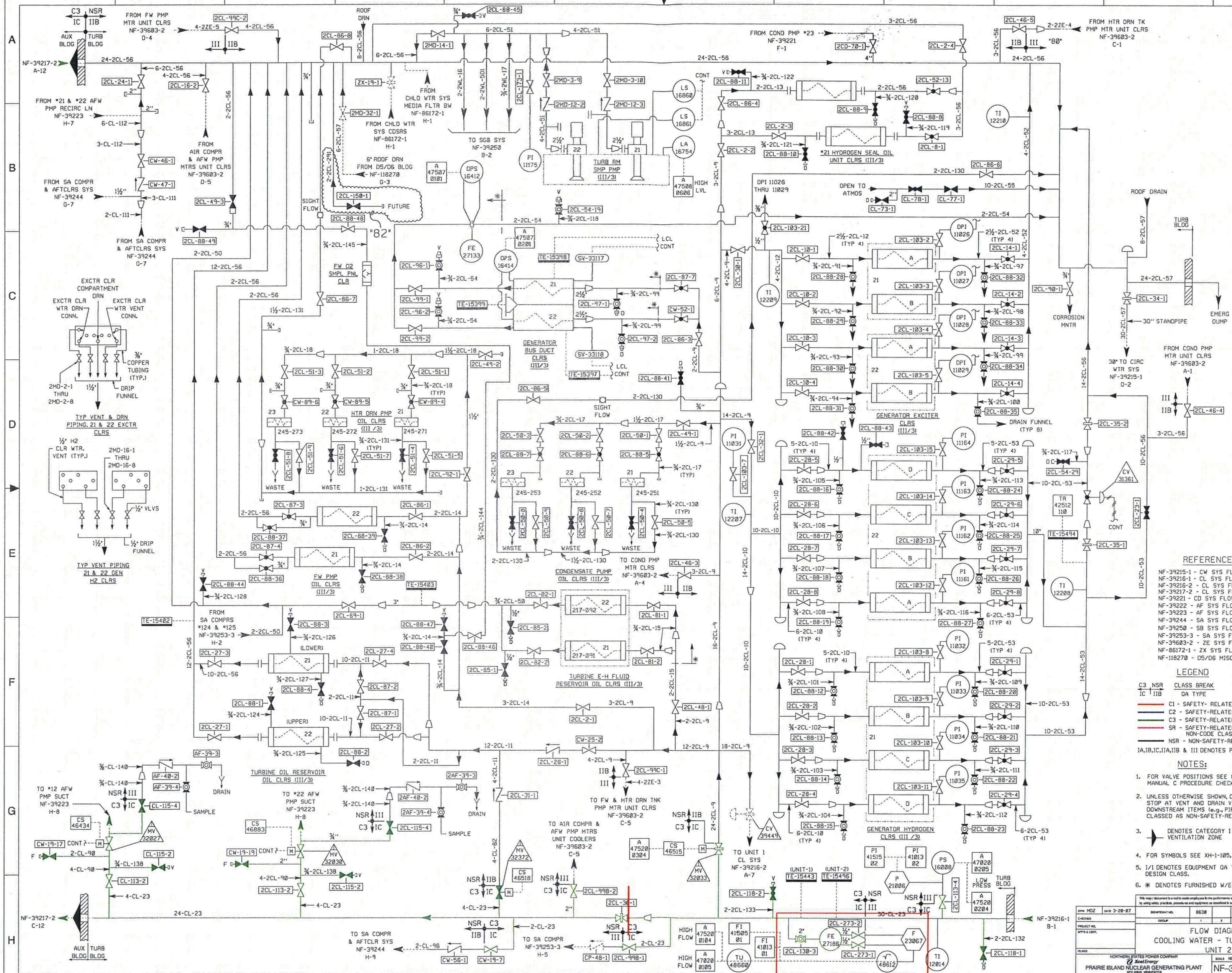
NORTHERN STATES POWER COMPANY
Xcel Energy
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
RED WING, MINNESOTA

SCALE NTS | REV 80

NF-39216-2

$$USERNAME$$
$$$$$$SYTIME$$$$$$$$$$$$SYDATE$$$$$$
$$$$$$$$$DESIGNFIL$$$$$$$$$

NF-39216-2.DGN NSP GENERATION CAD



REVISIONS

78 AS BUILT- ADDED SAFETY CLASS LEGEND, NOTES & SAFETY CLASS AS NOTED 04NS15 PER DRR PI-08-080
DWN: JK 11-3-08
CHK'D: DB 8-21-09
REVIEWED: WJI 8-24-09
MOD#: EC-13291
FILMED 9-09

79 AS BUILT- REDRAWN PER SYSTEM WALKDOWN, INCORPORATED SAFETY CLASS DESIGNATIONS.
04NS15 PER DRR PI-10-048
DWN: JEK 3-31-10
CHK'D: DB 5-11-10
REVIEWED: WJI 5-11-10
MOD#: EC-14552
APP'D: CMR 5-12-10

80 AS BUILT- ADDED QA DESIGNATION FLAGS. 04NS15
PER DRR PI-10-182
DWN: DB 10-14-10
CHK'D: JEK 11-24-10
MOD#: EC-17064
APP'D: CMR 11-29-10

81 AS BUILT- ADDED 2" IA COMPR CLG WTR RTRN LINE 2-CL-291 & VALVE CL-150-1
PER DRR PI-11-234
DWN: KJF 12-7-11
CHK'D: MSV 12-12-11
MOD#: EC-14269
APP'D: CMR 12-12-11

82 AS BUILT- REV'D LINE NO 2-CL-291 TO 2-2CL-291, VLV NO CL-150-1 TO 2CL-150-1 & LINE CONT TO READ FUTURE.
PER DRR PI-13-163
DWN: DB 10-2-13
CHK'D: RLC 10-2-13
MOD#: EC-14269
APP'D: CMR 10-2-13

REFERENCE DWGS

NF-39215-1 - CW SYS FLOW DIA UNIT 1 & 2
NF-39216-1 - CL SYS FLOW DIA UNIT 1
NF-39216-2 - CL SYS FLOW DIA UNIT 1
NF-39217-2 - CL SYS FLOW DIA UNIT 2
NF-39221 - CD SYS FLOW DIA UNIT 2
NF-39222 - AF SYS FLOW DIA UNIT 1
NF-39223 - AF SYS FLOW DIA UNIT 2
NF-39244 - SA SYS FLOW DIA UNIT 1 & 2
NF-39250 - SB SYS FLOW DIA UNIT 2
NF-39253-3 - SA SYS FLOW DIA UNIT 1 & 2
NF-39603-2 - ZE SYS FLOW DIA UNIT 1 & 2
NF-86172-1 - ZX SYS FLOW DIA UNIT 1 & 2
NF-118270 - D5/D6 MISC DRNS UNIT 2

LEGEND

C3 NSR / IC IIB — CLASS BREAK / QA TYPE

- C1 - SAFETY- RELATED; ISI CLASS 1
- C2 - SAFETY-RELATED; ISI CLASS 2
- C3 - SAFETY-RELATED; ISI CLASS 3
- SR - SAFETY-RELATED FLUID BOUNDARY; NON-CODE CLASS
- NSR - NON-SAFETY-RELATED

IA,IB,IC,IIA,IIB & III DENOTES PIPING QA TYPES.

NOTES:

1. FOR VALVE POSITIONS SEE OPS MANUAL C PROCEDURE CHECKLIST.
2. UNLESS OTHERWISE SHOWN, CLASS BOUNDARIES STOP AT VENT AND DRAIN VALVES WITH DOWNSTREAM ITEMS (e.g., PIPE, CAPS, ETC.) CLASSED AS NON-SAFETY-RELATED.
3. DENOTES CATEGORY I VENTILATION ZONE
4. FOR SYMBOLS SEE XH-1-105, NF-39214.
5. I/1 DENOTES EQUIPMENT QA TYPE/ DESIGN CLASS.
6. * DENOTES FURNISHED W/EQUIP.

SIGNIFICANT NO.	8630			2	4410	1	8540
GROUP	1	2	3	4	5	CL	6

DWN MDZ DATE 3-20-07
CHECKED
PROJECT NO.
APP'D & CERT.
FILMED

FLOW DIAGRAM
COOLING WATER - TURBINE BUILD
UNIT 2

NORTHERN STATES POWER COMPANY
Xcel Energy
PRAIRIE ISLAND NUCLEAR GENERATING PLANT
RED WING, MINNESOTA

SCALE NONE REV 82

NF-39217-1

$$USERNAME$$
$$$$$$SYTIME$$$$$$$$$$$$SYDATE$$$$$$
$$$$$$$$$DESIGNFIL$$$$$$$$$

NF-39217-1.DGN NSP GENERATION CAD

NF-39217-1

C	LOSS OF PUMPING CAPACITY OR SUPPLY HEADER WITH SI	NUMBER: C35 AOP1
		REV. 14
		Page 1 of 1

Figure 1
Simplified Cooling Water System Flow Diagram