

February 21, 2003

Mr. T. Coutu
Site Vice President
Kewaunee Nuclear Power Plant
N490 Hwy 42
Kewaunee, WI 54216

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT
NRC INSPECTION REPORT 50-305/02-07(DRS)

Dear Mr. Coutu:

On November 8, 2002, the NRC completed an inspection at your Kewaunee Nuclear Power Plant. The enclosed report documents the inspection findings, which were discussed on November 8, 2002, with you and other members of your staff. Follow-up telephone exits were held with you and members of licensee management, on December 19, 2002, and January 21, 2003.

The inspection examined activities conducted under your license as they relate 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, this inspection focused on the design and performance capability of the component cooling water system to ensure that it was capable of performing its required safety-related functions. In addition, the inspection reviewed a sample of permanent plant modifications and changes made under 10 CFR 50.59.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green) that were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they were entered into your corrective action program, the NRC is treating the issues as Non-Cited Violations in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these Non-Cited Violations, in whole or in part, you should provide a response with a basis for your denial, 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 Kewaunee Nuclear Power Plant.

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Sincerely,

/RA by RCaniano Acting For/

Cynthia D. Pederson, Director
Division of Reactor Safety

Docket No. 50-305
License No. DPR-43

Enclosure: Inspection Report 50-305/02-07(DRS)

cc w/encl: D. Graham, Director, Bureau of Field Operations
Chairman, Wisconsin Public Service Commission
State Liaison Officer

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**NRR concurrence for section 1R17.b of inspection report

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-305
License No: DPR-43

Report No: 50-305/02-07

Licensee: Nuclear Management Company, LLC

Facility: Kewaunee Nuclear Power Plant

Location: N490 State Highway 42
Kewaunee, WI 54216

Dates: October 21, 2002, through November 8, 2002

Re-exit Dates: December 19, 2002
January 21, 2003

Inspectors: A. Dunlop, Reactor Engineer
Z. Falevits, Reactor Engineer
J. Neurauter, Reactor Engineer
S. Sheldon, Reactor Engineer
T. Bilik, Reactor Engineer, Trainee
J. Panchison, Mechanical Contractor
H. Anderson, Mechanical Contractor
C. Baron, Mechanical Contractor

Approved by: David E. Hills, Chief
Mechanical Engineering Branch
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000305/02-07(DRS); Nuclear Management Company, LLC; on 10/21-11/8/2002, Kewaunee Nuclear Power Plant. Safety System Design and Performance Capability Inspection.

The inspection was a three-week baseline inspection of the design and performance capability of the component cooling water system. In addition, the biennial reviews of permanent plant modifications and 10 CFR 50.59 evaluations were concurrently performed. The inspection was conducted by regional engineering specialists with mechanical consultants' assistance. The inspection identified two issues of very low significance.

The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609 Significance Determination Process (SDP). Findings for which the SDP does not apply may be Green, or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Revision 3, dated July 2000.

A. Inspection Findings

Cornerstone: Mitigating Systems

- Green. A finding of very low safety significance associated with a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified that pertained to improper application and use of a common non-safety related power supply to feed two redundant safety related circuits. This was not in accordance with the plant engineering specification procedure, the Updated Safety Analysis Report and the applicable Electrical and Electronics Engineers Standards.

This finding was more than minor because this finding was associated with design control attributes which affected the Mitigating Systems Cornerstone objective to ensure the reliability and capability of the component cooling water (CCW) system to respond to initiating events to prevent undesirable consequences. The use of a common balance of plant (non-safety) power supply to feed redundant safeguard electrical circuits, the lack of adequate electrical separation, and evaluation of seismic qualifications of some of these redundant circuits and components have the potential to upset plant stability, challenge critical safety functions during shutdown as well as power operations, and could potentially affect the reliability and capability of the CCW system to respond to initiating events.

This design deficiency finding is assessed as Green because it did not result an actual loss of the CCW system's safety function. A review of the system design identified a number of electrical separation issues, but did not result in any immediate operability concerns. This provides reasonable assurance that there has not been an actual loss of system function due to this condition. Therefore, this issue was screened out of the significance determination process as Green (Section 1R17).

- Green. A finding of very low safety significance associated with a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified that related to

the control and quality of design basis engineering calculations. Specifically, a number of concerns were identified related to the indexing and control of existing calculations, the lack of available calculations to support some aspects of the current design basis, and errors in existing calculations. As a result of these issues, the current design basis calculations, as well as the existing calculation control processes, may not be adequate to ensure that the design basis will continue to be maintained. Although none of the specific deficiencies identified during the inspection resulted in immediate operability concerns, it was concluded that the component cooling water system design basis was not being adequately controlled by the existing calculations.

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This finding was more than minor based on the potential that the lack of adequate control and quality of design basis calculations could result in the ability of the component cooling water system to perform its safety functions to be degraded. Design basis calculations were routinely used in support of design changes, operating procedures, test acceptance criteria, and operability determinations. This finding was of very low safety significance (Green) because it did not represent an actual loss of the component cooling water system's safety function. (Section 1R21.2)

C. Licensee-identified Violations

No findings of significance were identified.

REPORT DETAILS

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R02 Evaluations of Changes, Tests, or Experiments (71111.02)

Review of Evaluations and Screenings for Changes, Tests, or Experiments

a. Inspection Scope

The inspectors reviewed nine 10 CFR 50.59 evaluations and twelve screenings. These documents were reviewed to ensure consistency with the requirements of 10 CFR 50.59. The inspectors used Nuclear Energy Institute (NEI) 96-07, Guidelines of 50.59 Evaluations, Revision 1, to determine acceptability of the completed evaluations and screenings. The NEI document was endorsed by the NRC in Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," November 2000. The inspectors also consulted Inspection Manual, Part 9900, 10 CFR GUIDANCE: 50.59. Documents reviewed during the inspection are listed at the end of the report.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (71111.17B)

Review of Recent Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed 17 permanent plant modifications that were performed by the licensee's engineering staff during the last two years, 10 of which were commercial grade dedications. Three of the modifications affected the component cooling water system and therefore, review of these modifications counted for completion of activities under both NRC Inspection Procedures 71111, Attachments 17 and 21. The modifications were reviewed to verify that the completed design changes were in accordance with specified design requirements and the licensing bases and to confirm that the changes did not affect the modified system or other systems' safety function. Calculations which were performed or revised to support the modifications were also reviewed. As applicable to the status of the modification, post-modification testing was reviewed to verify that the system, and associated support systems, functioned properly and that the modification accomplished its intended function. The inspectors also verified that the completed modifications did not place the plant in an increased risk configuration. The inspectors evaluated the modifications against the licensee's design basis documents and the Updated Safety Analysis Report (USAR). The inspectors also used applicable industry standards, such as the American Society of Mechanical

Engineers (ASME) Code and the Institute of Electrical and Electronics Engineers (IEEE) Standards, to evaluate acceptability of the modifications.

b. Findings

Introduction: Green. The inspectors identified a Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," that pertained to improper application and use of a common balance-of-plant (BOP) non-safety power supply to feed two redundant safety related control valve circuits.

Discussion: Design Change Request (DCR) 3163 was initiated on January 30, 2000, to align the service water (SW) system on a safety injection (SI) signal to maximize flow to the containment fan coil units early in the event of an accident. Specifically, the design change modified the control circuits for SW to component cooling water (CCW) heat exchangers temperature control valves CV-31406/SW-1306A (Train A) and CV-31407/SW-1306B (Train B). The design change modified the control logic and added control switches, relays, and solenoid valves, which would cause the SW-1306A/B valves to open on a SI signal and on loss of the non-safety control power.

The valves were designed to modulate and control SW flow to the CCW heat exchangers, thereby controlling CCW temperature during normal plant operation. If the valves were fully open, the CCW temperature at the heat exchanger outlet would be cooled to approximately the SW temperature. This would then result in a subsequent cooldown of the letdown flow temperature. The valves were designed to fail open on a SI signal, loss of air, or loss of electrical power.

The DCR documented that actuators for SW-1306A/B, the SI relay contacts, the new switches, relays, and the cabling from the existing relays to the new relays were all classified QA1 (safety related) and were to be separated per plant Engineering Specification ES-9010, "Cable Installation and Separation Criteria," and IEEE Standard 308-1971, "Criteria for Class 1E Electric Systems for Nuclear Power Generating Stations." The inspectors noted that separation criteria in ES-9010 included the following:

- Section 4.1, "Safeguard Separation" stated, "The objective of the following criteria is to achieve independent electrical systems compatible with and for redundant equipment. Cable separation shall provide sufficient isolation between redundant systems so that no single failure or credible incident can render both systems inoperable or remove them from service."
- Section 4.1.2 stated, "There are two "trains" provided for the Redundant Safeguard System and four "channels" provided for the Reactor Protection System. Separation of these trains or channels must be maintained to preclude the possibility of any single incident causing both trains or more than one channel from becoming inoperative. The power, control, and instrumentation cables and trays for the Safeguard System and Reactor Protection System shall be separated as follows: Train "A," Train "B..."
- Section 4.1.3 stated, "The power cables for each Redundant Safeguard System may be placed in the cable trays only of the same train."

- Section 4.1.14 stated, "Where the wiring for redundant engineered safety features is within a single panel or panel section, this wiring shall be separated, one group from the other by six-inch (6") air space or fireproof barrier..., wiring not associated with either "train" may be grouped with one train but may not cross from one "train" bundle to the other "train."

The inspectors also noted that USAR Section 8.2-2, "Separation Criteria," Revision 17, contained similar separation requirements to the one specified in ES-9010. The separation criteria in the USAR included the following:

- Cable separation provides sufficient isolation between redundant systems so that no single failure or electrical incident can render both redundant systems inoperable or remove them from service.
- Non-safety related power, control or instrumentation cable shall not be permitted to cross over from one safeguard tray to another.
- Where the wiring for redundant engineering safety features is within a single panel or panel section, the wiring is separated one group from another, by a 6-inch air space or a fireproof barrier. The barriers are steel metal or flexible metallic conduit. Wiring not associated with either train may be grouped with one train but may not cross from one train bundle to the other train.

IEEE Standard 308-1971, Section 5.4, "Vital Instrumentation and Control Power Systems," stated in part,

Dependable power supplies are required for the vital instrumentation and control systems of the unit(s) including the engineering safety feature instrumentation and control systems.

Power must be supplied to these systems in such a manner as to preserve their reliability, independence and redundancy. Typically one or more of the following may be required: (3) two or more independent alternating current power supplies having a degree of reliability and availability, compatible with systems they serve.

The inspectors concluded that use of a common non-safety related power supply to feed both trains of safety related circuits was not in accordance with the requirements stated above. The non-safety related power supply was not considered quality power that was free from adverse voltage and current transients, which can disturb component operation.

IEEE Standard 279-1968, "Proposed IEEE Criteria for Nuclear Power Plant Protection Systems," required that protection systems that generate reactor trip or engineered safeguards actuation meet the single failure criterion specified in the IEEE Standard. Section 4.2 states under Single Failure Criterion, "any single failure within the protection system shall not prevent proper protection system action when required." Valves SW-1306A and B were designed as redundant safeguard components/systems and were therefore required to meet the single failure criterion of IEEE Standard 279.

Section 3, "Design Basis," states in part, a specific protection system design basis shall be provided for each nuclear power plant and shall document as a minimum the following: (h) the malfunction, accidents, or other unusual events (e.g., fire, explosion, missiles, lightening, flood, earth-quake, etc.) which could physically damage protection system components or could cause environmental changes leading to functional degradation of system performance and for which provisions must be incorporated to retain necessary protection system action.

The inspectors reviewed the safety evaluation for this DCR. In response to question No. 1, the safety evaluation for this DCR stated that the power supply for the control circuit remained the same and that the new valves were powered from separate power supplies, separated by Engineering Specification ES-9010. However, the inspectors determined that the 120VAC power supply for valves SW-1306A and SW-1306B redundant control circuit logic was not being provided from separate safeguards power supplies (as it should have been for redundant circuits) and was not separated per the separation requirements delineated in Engineering Specification ES-9010. The DCR design implemented in the field indicated that the redundant safeguards valves were powered from the same BOP (non-safeguard) power feed supplied by fuse panel RR172 (circuits ACNI-9 and ACNI-10), as shown on schematic diagram E-2492, Revision G. The licensee, however, considered it separate power supplies based on the use of a separate fuse from the same BOP source to feed each of the redundant valve's control circuits. As such, the licensee considered that the installed modification was in agreement with the statements in the safety evaluation. On February 4, 2003, the licensee initiated CAP014584 which documented the difference between the licensee's and inspectors positions with respect to the statements in the safety evaluation. The CAP stated that this was not an operability issue and that there was no failure potential that can impact the operability of the CCW system from fulfilling its safeguards function. However, the inspectors noted that there was no detailed engineering analysis to evaluate all potential failures that could result from feeding both redundant circuits from the same BOP feed.

The inspectors also determined that while the DCR stated that the SW-1306A/B valve actuators (CV-31406 and CV-31407) were QA 1 components, they were supplied and installed as non-safety (QA-2) components (reference CAP013501, dated October 30, 2002). In addition, the inspectors noted that an evaluation was not performed for DCR 3163 to ensure that SW-1306A/B control switches 19904 and 19905 were seismically qualified. CAP014389 was initiated on January 20, 2003, to address this issue. The inspectors also noted that temperature controllers TC-26309 and TC-26310 used for controlling CCW temperature by modulating opening positions of valves 1306A and 1306B had been designated as non-safety components and were also fed from the same common non-safety power supply.

The DCR stated that normal (non-safeguards) power will be used to power the new solenoid valves consistent with the remainder of the SW 1306A/B valves and that the valves will be powered from two existing separate circuits. However, the inspectors noted that the remainder of the SW-1306A/B control circuits were designed and installed as safeguard systems but were fed from a common BOP feed.

The inspectors reviewed the electrical schematic and wiring diagrams for SW-1306A/B and noted that terminal box (TB)1371, shown on wiring diagram E-2112, Revision V, contained field wiring for both SW-1306A and SW-1306B valve circuits. Electrical conductors coded ACN1-9L1 and ACN1-9L2 (designated as Train A wires), electrical conductors coded ACN1-10L1 and ACN1-10L2 (designated as Train B wires), and BOP conductors ACN1-42L1 and ACN1-42L2 were all terminated to terminal blocks inside TB1371. In addition, a conduit containing the cables feeding control circuits for SW-1306A and SW-1306B valves was routed from Train A section to Train B section of TB2771. This conduit contained wire codes ACN1-42L1(power supply to BOP lights and controllers for both 1306A and 1306B valves), ACN1-9L1 and ACN1-9L2 (power supply to SW-1306A control circuit), and ACN1-10L1 and ACN1-10L2 (power to SW-1306B control circuit).

The inspectors also conducted a field inspection of SW-1306A/B and its associated components. Wiring diagram E-1531, Revision AJ, showed TB2771 wiring which included the new relays and switches. TB2771 was divided into two sections, which were separated horizontally by a fireproof metal barrier to separate SW-1306A (Train A) electrical components from SW-1306B (Train B) electrical components. The BOP feeds from common fuse panel RR172 were routed via the same conduit into TB2771. Train A related (9L1) 120VAC BOP feed was routed to the Train A section of TB2771 and Train B related (10L1) 120VAC BOP feed was routed via the same conduit to the Train B portion of TB2771. A short conduit was routed from Train A section to Train B section of TB2771. This conduit contained the BOP feed cables conductors. The inspectors determined that the present installed configuration of the 120VAC BOP feeds to SW-1306A/B resulted in electrically connecting Train A and Train B circuitry through the 120VAC BOP power supplies. Each of the SW-1306A/B control circuits was protected by one fuse and one slug located in RR172. The inspectors determined that the installed electrical configuration was contrary to the electrical separation requirements delineated in ES-9010, USAR 8.2.2, and IEEE-308-1971.

During review of condition reports, the inspectors identified that since May 2000, the SW-1306A and/or the SW-1306B valve(s) inadvertently opened on at least nine separate occasions. These following events occurred during normal plant operation due to random grid disturbances, lightning strikes, and/or surveillance testing activities.

- May 10, 2000, (Kewaunee Assessment Process (KAP) 00-001414) SW-1306A/B failed open when grid perturbation caused short lived loss of voltage. The KAP stated that this condition has been experienced in the past.
- September 2, 2000, (KAP 00-003120) an electrical disturbance caused by a lightning induced spike resulted in reactivity problems when SW-1306A and B had failed open.
- November 24, 2001, (KAP 01-018732) SW-1306B failed open during performance of SP-33-110, "Diesel Generator Automatic Test," as a result of load shedding and restarting of large loads. The KAP stated that the apparent cause for the identified problem appears to be that the system design is subject to this type of event because a momentary loss of power which occurs when switching 120VAC QA2 power will result in valves SW-1306A and B failing open.

- November 20, 2001, (KAP 01-18695) valves SW-1306A and B failed open during performance of surveillance testing SOP-ELV-40-8, after losing power during a power switching activity.
- June 24, 2002, (CAP012001) a transient where both SW-1306A and B valves opened due to an electrical transient. This caused the CCW temp to decrease, which could have had a positive reactivity affect on the reactor had the operators not taken actions. The CAP documented that operator workaround 01-22 and abnormal procedure A-CC-31A, "Abnormal Conditions in the Component Cooling System," were implemented to bypass the letdown demin and an auxiliary operator was dispatched to regain control of the system. Reactivity effects were monitored, although no changes were seen due to early recognition of the problem. The inspectors determined that loss of the common non-safety power supply resulted in both valves opening unexpectedly, challenging the operators by use of an operator workaround to expeditiously bypass letdown demin and prevent a potential positive reactivity effect.
- July 9, 2002, (CAP012174) a misalignment of substation capacitor bank opening and closing resulted in a voltage dip that caused SW-1306B to fail open. Operator workaround 01-22 and abnormal procedure A-CC-31A were implemented to bypass the letdown demin and an auxiliary operator was dispatched to regain control of the system.

The first three items above were determined by the licensee to be maintenance rule functional failures in maintenance rule evaluation MRE000082, dated November 21, 2001. The fourth item above was classified as a maintenance preventable functional failure in KAP 01-18695. Condition Evaluation CE002373, dated February 12, 2002, and apparent cause evaluation ACE001828, dated June 21, 2002, concluded that as a result of the numerous instances where valves SW-1306A and B have failed open, System 38 Function 04 (supplies 120VAC QA2 power) has had a repetitive MPFF and was considered (a)(2) degraded. ACE001828 documented three more instances where SW-1306A or B valves failed open on June 23, July 21, and July 22, 2002, during substation breaker manipulation and lightning strikes. Licensee's investigation (ACE001828) revealed the following three distinct concerns related to the SW-1306A and B valve events: (1) The effects of random grid disturbances while at full power should not result in these valves fully opening at times when plant power is not lost or interrupted and a SI signal is not present, (2) train separation (should the power supply for these valves be separated instead of tied to the same source), and (3) the controllers are obsolete.

To identify the correct cause of the SW-1306A/B valves inadvertent openings and to determine if Design Change 3205 (initiated to modify the power supplies to the electronic controllers) will address the concern of the undesired opening of these valves under certain conditions, the licensee issued temporary change TC 02-01 on July 2, 2002, to install monitoring equipment on the SW-1306B train. This has not yet been implemented in the field. Therefore, the inspectors noted that actual cause of SW-1306A/B failing open during normal plant operations has yet to be determined.

In a related matter, the licensee documented in OTH002449, dated August 30, 2001, that CC water temperature could reach 39°F during an event where a SI signal was generated (SW-1306A and B open). The licensee stated in the OTH that this

temperature was not considered in the piping analysis and that the issue needed to be examined by Westinghouse.

Analysis: Evaluation of this issue concluded that it was a design control issue resulting in a finding of very low safety significance (Green). The design control issue was due to a licensee performance deficiency in that the licensee failed to adequately control the design modification process for modification DCR 3163 as required by established plant and industry design standards.

In accordance with Manual Chapter 0612, the inspectors determined the issue was more than minor because this finding was associated with design control attributes which affected the Mitigating Systems Cornerstone objective to ensure the reliability and capability of the CCW system to respond to initiating events to prevent undesirable consequences. The use of a common BOP (non-safety) power supply to feed redundant safeguard electrical circuits, the lack of adequate electrical separation, and evaluation of seismic qualifications of some of these redundant circuits and components have the potential to upset plant stability, challenge critical safety functions during shutdown as well as power operations, and could potentially affect the reliability and capability of the CCW system to respond to initiating events.

This design deficiency finding is assessed as Green because it did not result in an actual loss of the CCW system's safety function. A review of the system design identified a number of electrical separation issues, but did not result in any immediate operability concerns. This provides reasonable assurance that there has not been an actual loss of system function due to this condition. Therefore, this issue was screened out of the significance determination process as Green.

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. It further states that design changes shall be subject to design control measures commensurate with those applied to the original design. Section 4.1.2 of ES-9010 states in part that cable separation shall provide sufficient isolation between redundant systems and that the power and control cables for the safeguard system shall be separated.

Contrary to the above, on June 30, 2000, the installed electrical configuration was not in accordance with plant and industry established electrical separation design requirements as specified in IEEE Standard 308-1971, and in ES-9010 for the control circuits for temperature control valves SW-1306A/CV-31406 and SW-1306B/CV-31407. The licensee used non-safety related 120VAC power supplies from a common fuse cabinet to feed the redundant safeguard system control circuits for these valves in lieu of separate safety related power supplies, which would provide sufficient isolation between these safeguard redundant systems.

Because of the low safety significance of this issue and because it was entered in the licensee's corrective action program (CAP013801), the issue is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-305/02-07-01).

1R21 Safety System Design and Performance Capability (71111.21)

Introduction

Inspection of safety system design and performance verifies the initial design and subsequent modifications and provides monitoring of the capability of the selected systems 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 verifies aspects of the mitigating systems cornerstone for which there are no indicators to measure performance.

The objective of the safety system design and performance capability inspection is to assess the adequacy of calculations, analyses, other engineering documents, and operational and testing practices that were used to support the performance of the selected systems during normal, abnormal, and accident conditions. The inspection was performed by a team of inspectors that consisted of a team leader, three Region III inspectors, and three mechanical consultants.

The component cooling system was selected for review during this inspection based upon:

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

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

- applicable technical specifications;
- applicable USAR sections; and
- the system's design documents.

The following system and component attributes were reviewed in detail:

System Requirements

Process Medium - water, electricity

Energy Source - electrical power, air

Control Systems - initiation, control, and shutdown actions

System Condition and Capability

Installed Configuration - elevation and flow path operation

Operation - system alignments and operator actions

Design - calculations and procedures

Testing - flow rate, pressure, temperature, voltage, and levels

Components

The component cooling water pumps and heat exchanger were selected for detailed review during the inspection. These components were specifically reviewed for component degradation due to the impact that its failure would have on the plant.

.1 System Requirements

a. Inspection Scope

The inspectors reviewed the updated safety analysis report, technical specifications, system descriptions, drawings and available design basis information to determine the performance requirements of the component cooling water system. The reviewed system attributes included process medium, energy sources, and control systems. The rationale for reviewing each of the attributes was:

Process Medium: This attribute required review to ensure that the component cooling water pumps would supply the required flow to the safety related components following design basis events. To achieve this function, the inspectors verified that the component cooling water system would be able to accept the design heat loads from the applicable safety related components through the residual heat removal heat exchanger and transfer sufficient heat to the service water system through the component cooling water heat exchanger to maintain system operability.

Energy Sources: This attribute required review to ensure that the component cooling water pumps would start when called upon, and that appropriate valves would have sufficient power to change state when so required. To achieve this function, the inspectors verified that the interactions between the component cooling water pumps and their support systems were appropriate such that all components would start when needed under normal or standby electrical power.

Controls: This attribute required review to ensure that the automatic controls for starting the component cooling water pumps, and associated system components, were properly established. Additionally, review of alarms and indicators was necessary to ensure that operator actions would be accomplished in accordance with the design.

b. Findings

No findings of significance were identified.

.2 System Condition and Capability

a. Inspection Scope

The inspectors reviewed design basis documents and plant drawings, abnormal and emergency operating procedures, requirements, and commitments identified in the updated safety analysis report and technical specifications. The inspectors compared the information in these documents to applicable electrical, instrumentation and control,

and mechanical calculations, setpoint changes, and plant modifications. The inspectors also reviewed operational procedures to verify that instructions to operators were consistent with design assumptions.

The inspectors reviewed information to verify that the actual system condition and tested capability was consistent with the identified design bases. Specifically, the inspectors reviewed the installed configuration, the system operation, the detailed design, and the system testing, as described below.

Installed Configuration: The inspectors confirmed that the installed configuration of the component cooling water system met the design basis by performing detailed system walkdowns. The walkdowns focused on the installation and configuration of piping, components, and instruments; the placement of protective barriers and systems; the susceptibility to flooding, fire, or other environmental concerns; physical separation; provisions for seismic and other pressure transient concerns; and the conformance of the currently installed configuration of the systems with the design and licensing bases.

Design: The inspectors reviewed the mechanical, electrical, and instrumentation design of the component cooling water system to verify that the system and subsystems would function as required under accident conditions. This included a review of the design basis, design changes, design assumptions, calculations, boundary conditions, and models as well as a review of selected modification packages. Instrumentation was reviewed to verify appropriateness of applications and set-points based on the required equipment function. Additionally, the inspectors performed limited analyses in several areas to verify the appropriateness of the design values.

Testing: The inspectors reviewed records of selected periodic testing and calibration procedures and results to verify that the design requirements of calculations, drawings, and procedures were incorporated in the system and were adequately demonstrated by test results. Test results were also reviewed to ensure automatic initiations occurred within required times and that testing was consistent with design basis information. Pre-operational test data was also reviewed to confirm initial design parameters that could not be tested under normal operations.

b. Findings

Design Basis Information

Based on the inability or difficulties in retrieving design information requested by the inspectors, licensee personnel documented that, in many cases, design basis information for the CCW system was difficult if not impossible to locate. Licensee personnel initiated CAP013087 and CAP013119 to enter the problem in the corrective action program. This issue was also identified during the previous NRC Safety System Design and Performance Capability Inspection for the service water system and entered into the corrective action program as KAP 00-002566. The licensee in response to this issue has been developing Design Basis System Functional Matrixes for a number of systems including the component cooling water system. These documents were still in

draft at the time of the inspection, although it appears that some progress has been made in identifying and controlling design basis information.

Calculation Control and Quality Issues

Introduction: Green. The inspectors identified a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," that related to the control and quality of design basis engineering calculations. Specifically, the inspectors identified a number of concerns related to the indexing and control of existing calculations (including the failure to use appropriate and/or current calculation inputs and assumptions), the lack of available calculations to support some aspects of the current design basis, and errors in existing calculations. As a result of these issues, the inspectors determined that the current design basis calculations, as well as the existing calculation control processes, may not be adequate to ensure that the design basis will continue to be maintained. Although none of the specific deficiencies identified during the inspection resulted in immediate operability concerns, the inspectors concluded that the CCW system design basis was not being adequately controlled by the existing calculations.

Discussion: During the inspection the inspectors noted a number of calculation deficiencies. The licensee initiated individual CAPs, as appropriate, to ensure that each of these conditions will be addressed by the corrective action system. In addition, the licensee initiated two "high level" CAPs, CAP013531 and CAP013532, to address calculation indexing and calculation errors, respectively. The following discussion includes examples of calculation deficiencies identified during the inspection.

Indexing and Control of Existing Calculations - The inspectors identified concerns related to the indexing and control of existing calculations. As shown in the following examples, conditions were identified where design basis calculations were not based on current input data, were based on assumed inputs in lieu of calculated values, were not consistent with other design basis calculations, or were not revised when appropriate to reflect a change in input data. Review of calculation indexes and discussions with licensee personnel indicated that these issues were related to inadequate indexing and control of design basis calculations. The inspectors also found that it was difficult to identify the status of calculations, and to determine if a calculation was a current design basis calculation. In response to these concerns, the licensee initiated CAP013531 that concluded that Kewaunee was not up to industry standards with regard to calculation controls, and addressed in the generation of system functional matrixes the need to use the "Currator" database for the indexing of calculations.

- Calculation C11353, "Determination of CCW Pump delta-P Acceptance Criteria for use in SP 31-168," concluded that an acceptable pump degradation for the CCW pumps was 10 percent, which was consistent with the permissible degradation established in ASME OM-6. Subsequent to the issuance of the referenced calculation, a CCW system hydraulic flow model was developed and depicted in calculation C11409. Interpolating the flow model results from the calculation results indicated that the CCW pumps were limited to approximately a 5 percent degradation based on the required flows during post LOCA [loss-of-coolant-accident] recirculation. Using the results of calculation C11353 would permit degradation of the CCW pumps to less than design basis flow

requirements. At the time of the inspection no operability issues were associated with this condition since new CCW pumps had been installed and were exhibiting very little degradation. Additionally, subsequent to the development of the hydraulic model, a sensitivity analysis was performed by the licensee to demonstrate that a reduced CCW flow requirement would be adequate during post LOCA recirculation.

Although there were no operability concerns, design basis documents existed that were not consistent as to inputs and assumptions and were not properly linked together. This particular example was identified by the licensee just prior to the inspection and was documented in CAP013269, however this is an example of the inspectors's concern found in other design basis calculations.

- Calculation 611.1128.M3, "Determine the Highest Relieving Pressure in the CC System," determined the maximum pressure the CCW system could experience as a result of a tube rupture in one of the major heat exchangers. The calculation concluded that the low point in the system, the residual heat removal (RHR) pump seal water heat exchangers, could exceed their design pressure by approximately 15.7 percent. The calculation concluded that this condition was acceptable, and the results of the calculation were reflected in USAR Section 9.3.3.

One of the inputs to this calculation was the maximum (shutoff) head of the CCW pumps. A maximum pump head value of 265 feet was used based on the original CCW pump curves. The inspectors noted that the new CCW pumps (DCR 3128) were provided with a maximum head of greater than 270 feet. Calculation 611.1128.M3 had not been revised to reflect this more limiting input. In addition, the inspectors noted a slight difference between the calculation results and the values presented in USAR Section 9.3.3. In response to these concerns, the licensee initiated CAP013567. The licensee evaluated the condition and concluded that there were no operability concerns based on the margins associated with the ASME code, the operating history of this equipment, and the fact that the system was originally pressure tested to 225 psig.

- Calculation C11396, "Effect of Sleeving and 50 Equivalent Plugged Tubes in the Component Cooling Water Heat Exchangers," assumed a 2500 gpm CCW heat exchanger flow value, which appeared to be non-conservative. The licensee stated that the flow value was based on calculation C11376, "Determine Acceptable SW Flow to Component Cooling Water Heat Exchanger," and that the flow value in C11376 was based on test data from surveillance procedure SP31-168. The licensee also stated that a concern with this flow value had been identified shortly before the inspection, and initiated CAP013220.

As discussed in CAP013220, the assumed CCW flow of 2500 gpm would not be bounding for a single failure scenario resulting in one CCW pump providing flow to two CCW heat exchangers. In response to this issue, Addendum A to calculation C11376 was issued to verify that the actual flow rate would be sufficient for the required heat removal. Addendum A to calculation C11376 included the assumption that 50 equivalent CCW heat exchanger tubes were

plugged to be consistent with calculation C11396. As a result of Addendum A to calculation C11376, it was concluded that the results of calculation C11396 are bounding.

- Calculation C11053, "Evaluate the Acceptability of the Throttled Positions of Valves CC-402A and CC-402B," assumed CCW system alignment and CCW flow rates to provide the necessary heat removal to support maintaining the reactor coolant system temperature at 140F during refueling mode activities. These unverified assumptions were included in the thermal performance calculation concerning the alignment and flow through each CCW heat exchanger, and the flow either through a single RHR heat exchanger or through other available flow paths that would be in parallel to the flowpath through the RHR heat exchanger.

The licensee modified existing CAP 008661 and CAP 013259/OTH 008995 to include verification, using the system hydraulic model, of the assumed CCW flow through the CCW heat exchangers and through the other downstream parallel flow paths in subsequent revision of calculation C11053 and associated operating procedures.

The inspectors also identified that calculation C11053 did not address instrument accuracy in determining SW system temperature limitations to support maintaining refueling mode temperatures at 140F. The licensee initiated CAP013477 to revise calculation C11053 to account for instrument accuracy (+/- 2F) in determining limitations on the main SW header local temperature indicators, which would be used to monitor SW inlet temperature.

- Calculations C10510, "Voltage Ratings of Safeguard DC Operated Devices," C-038-003, "125 VDC Safeguard Distribution Network Cable Voltage Drops," and ESR 90-104, "Evaluate DC Distribution to Diesel Generators," each addressed an aspect of design adequacy for the safeguard 125VDC distribution system. Calculation C10510, referenced calculation C-038-003, Revision 3, while Revision 5 had already been issued. Licensee personnel previously determined that calculation C10510 should have been revised. The inspectors also noted that ESR 90-104 results were not reflected back into calculation C10510. The licensee initiated CAP 013368 to address this issue. Due to the fact that the 125VDC safeguard batteries were sized for an 8-hour mission time, and the licensee was licensed for a 4-hour mission time, there did not appear to be any operability concerns associated with this issue.

Lack of Available Calculations to Support Aspects of the Current Design Basis - The inspectors identified the following examples of design basis requirements that were not supported by available calculations. These conditions also appear to be related to the deficiencies in calculation control. Because an index of available design basis calculations was not available, the inspectors found that it was difficult to identify those design basis requirements that were not supported by calculations.

- The inspectors requested the supporting calculations for the performance of the CCW system during an 10 CFR 50, Appendix R safe shutdown. The licensee

responded that there was not an analysis to address the CCW system's capability to reach cold shutdown conditions within 72 hours with a single train of CCW available as required by Appendix R and initiated CAP013454. The licensee stated that there was a high level of confidence that this safe shutdown requirement could be met based on an existing analysis of the Point Beach CCW system for an Appendix R safe shutdown. The Point Beach CCW system was capable of achieving cold shutdown conditions for two units within the required time with only one CCW pump available. The Kewaunee CCW system would be required to achieve cold shutdown conditions for only one unit with one similar CCW pump available. Therefore, the licensee concluded that the Point Beach analysis would be bounding.

- The inspectors requested the supporting documentation to verify the capability of relief valves CC-611A and CC-611B to pass sufficient flow in the event of a postulated reactor coolant pump thermal barrier rupture. The Westinghouse specification sheet indicated that the valves were sized to pass 570 gpm of water. However, in the event of a thermal barrier rupture these valves would be required to pass a mixture of steam and water to prevent overpressurization of the associated CCW piping. CAP 013574 was initiated to address this issue. The licensee stated that the Point Beach relief valves, which were similar in design but smaller in size, were sized to pass 380 gpm of steam/water mixture at 25 percent quality. The latest available information from Westinghouse indicated that a Kewaunee thermal barrier rupture would result in a leakage equivalent to 260 gpm. The licensee stated that a Kewaunee thermal barrier rupture would also result in a steam/water mixture of 25 percent quality. Therefore, the larger Kewaunee relief valves appear to be adequate to prevent overpressurization of the CCW piping system.

Errors in Calculations - The inspectors identified the following examples of a variety of errors in the calculations reviewed during the inspection. In response to this concern, the licensee initiated CAP013532 to address the overall issue of calculation errors and discrepancies.

- Calculation C11400, "NEP 4.10 Evaluation of Piping Changes Associated with DCR 3413," evaluated the effect of adding small vent lines to the CCW system. A calculation assumption stated, "a stress intensification factor for calculating stress in the main pipe header does not need to be considered for the addition of the vent line assemblies since the diameter of the vent line branch is less than D/4 (item 6, Form NEP 4.16-3)," where D is the nominal diameter of the header pipe. NEP 4.16, "Piping Configuration Reconciliation to Comply with IEB 79-14," did not provide any justification to omit stress intensification factors for branch lines with a diameter less than D/4, which was required by USA Standard Code for Pressure Piping B31.1.0-1967, "Power Piping." CAP013456 was initiated to address this issue. The licensee, however, did review header pipe stress reports at the vent line locations and documented that the stresses were very low such that there were no immediate operability concerns for calculation C11400.
- Calculation C10659, "Maximum Working Pressure of RHR Pump Seal Heat Exchanger," applied the rules of ASME Section VIII to conservatively calculate

maximum allowable internal pressure of the RHR pump seal heat exchanger, even though it was not an ASME stamped vessel. The calculation did not adequately address the requirements of ASME Section VIII Part UCI, "Requirements for Pressure Vessels Constructed of Cast Iron." Maximum allowable vessel internal pressure was calculated using UG-22 formulas, but UCI-3 imposed more conservative pressure-temperature limits that were not considered. Also, this calculation did not evaluate all applicable loadings of UG-22 as required by UCI-23 as only internal pressure was evaluated. The licensee initiated CAP 013592 and demonstrated RHR pump seal cooler operability for maximum temperature-internal pressure.

Analysis: Evaluation of this issue concluded that it is a design control deficiency resulting in a finding of very low safety significance (Green). The design control deficiency was due to a licensee performance deficiency in that design calculations either did not exist or contained errors. The Mitigating Systems Cornerstone was affected due to the potential for the CCW system providing long term heat removal function being degraded by this condition. No other cornerstones were degraded as a result of this issue.

The inspectors determined that this finding was associated with design control attributes and affected the objective of the Mitigating Systems Cornerstone to ensure the capability of the CCW system to respond to initiating events to prevent undesirable consequences, and is therefore greater than minor. The lack of adequate control and quality of design basis calculations had the potential to result in the ability of the CCW system to perform its safety functions to be degraded. Design basis calculations were routinely used in support of design changes, operating procedures, test acceptance criteria, and operability determinations.

This finding was assessed as Green because it did not represent an actual loss of the CCW system's safety function. A review of the system calculations identified a number of deficiencies, but did not result in any immediate operability concerns. This provided reasonable assurance that there was not an actual loss of system function due to this condition. Therefore, this issue was screened out of the significance determination process as Green.

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, "Design Control," states, in part, that measures be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, as of November 8, 2002, the design basis of the component cooling water system were not correctly translated into plant documents, in that design calculations contained errors or were not available to verify that the CCW system design basis capability was maintained.

Because of the low safety significance of this issue and because it is in the licensee's corrective action program, the issue is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-305/02-07-02). The

licensee initiated CAP 013531 to address calculation indexing and CAP 013532 to address calculation errors.

.3 Components

a. Inspection Scope

The inspectors examined the component cooling water pumps and component cooling heat exchangers to ensure that component level attributes were satisfied. The attribute selected for review was component degradation.

Component Degradation: This attribute was verified through review of component repair histories and review of corrective action documents. The inspectors reviewed the attribute to verify the licensee was appropriately maintaining components in the component cooling water system

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES (OA)**

4OA2 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed a sample of component cooling water system, permanent plant modifications, and 10 CFR 50.59 program problems that were identified by the licensee and entered into the corrective action program. The inspectors reviewed these issues to verify an appropriate threshold for identifying issues and to evaluate the effectiveness of corrective actions related to design issues. In addition, condition reports initiated on issues identified during the inspection were reviewed to verify adequate problem identification and incorporation of the problem into the corrective action system. The specific corrective action documents that were sampled and reviewed by the inspectors are listed in the attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exits

Exit Meeting

The inspectors presented the inspection results to Mr. T. Coutu, and other members of licensee management, on November 8, 2002. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. Two documents were determined to be

proprietary information and both were returned to the licensee at the end of the inspection. Two follow-up telephone exits were held with Mr. Coutu and other members of licensee management, on December 19, 2002, and January 21, 2003. The licensee indicated they did not agree with the NCV 50-305/02-07-01 documented in section 1R17 of this report and may submit an appeal based on different interpretation of which requirements were applicable for this modification.

KEY POINTS OF CONTACT

Licensee Management

M. Aulik, Supervisor Engineering (Modifications)
L. Armstrong, Engineering Director
T. Coutu, Site Vice President, Kewaunee Site
G. Harrington, Compliance Supervisor
K. Hull, Supervisor Engineering (Mechanical)
J. McCarthy, Operations Manager
M. Reddemann, Vice President Engineering
P. Rescheske, Senior Engineer (50.59s)
K. Schommer, Supervisor Engineering (Electrical)
T. Webb, Regulatory Affairs Manager
E. Weinkam, Director Regulatory Services (Hudson)

NRC

A. Gill, Acting Section Chief, Electrical Engineering Branch, NRR
D. Hills, Chief, Mechanical Engineering Branch, Division of Reactor Safety, RIII
J. Lamb, Kewaunee Project Manager, NRR
J. Lara, Senior Resident Inspector
T. Narinder, Electrical Engineering Branch, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

50-305/02-07-01	NCV	Failure to maintain adequate separation of safety related circuits
50-305/02-07-02	NCV	Design basis calculations contained errors or did not exist

Discussed

None

LIST OF ACRONYMS USED

ADAMS	Agency-wide Document Access and Management System
ASME	American Society of Mechanical Engineers
BOP	Balance-of-Plant
CAP	Corrective Action Process
CFR	Code of Federal Regulations
CC/CCW	Component Cooling Water
DCR	Design Change Request
DRS	Division of Reactor Safety
F	Fahrenheit
gpm	Gallons per Minute
IEB	Inspection and Enforcement Bulletin
IEEE	Institute of Electrical and Electronics Engineers
KAP	Kewaunee Assessment Process
LOCA	Loss-of-coolant-accident
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PARS	Publicly Available Records System
RHR	Residual Heat Removal
SDP	Significance Determination Process
SI	Safety Injection
SW	Service Water
TB	Terminal Board
USAR	Updated Safety Analysis Report
VAC	Volts Alternating Current

LIST OF DOCUMENTS REVIEWED

Number	Title	Revision/Date
<u>Calculations</u>		
1179.M7	Effect of Increased Service Water Temperature on the Component Cooling Heat Exchanger Post-LOCA Performance	Revision 0
1179.M8	Service Water Elevated Temperature Report	Revision 0
8814-05-EPED1	CAPTOR Data Loading for Breaker Coordination	Addendum A
611.1098.M2	Component Cooling System Heat Loss Calculations	Revision 0
611.1128.M1	Investigation of Component Cooling System Overpressurization	Revision 0
611.1128.M2	Component Cooling Surge Tank Overflow Line Head Calculations	Revision 1
611.1128.M3	Determine the Highest Relieving Pressure in the CC System	Revision 0
611.1147.M1	Containment Integrity Technical Review - Component Cooling Water, Excess Letdown Heat Exchanger Collapse Pressure	Revision 0
812.1179.P1	Component Cooling Surge Tank Shell and Nozzle Stress Analysis	Revision 0
812.1179.P4	Calculation of Minimum Thickness of Shell and Cover Plates on the Component Cooling Heat Exchangers	Revision 0
C10014	Fuse Tripping Time (Ref. RE-39-023)	February 15, 1992
C10030	Electrical Overcurrent Coordination 12/208VAC Distribution Cabinets BRA-127 and BRB-127	March 20, 1992
C10510	Voltage Ratings of Safeguard DC Operated Devices	Revision ORG
C10650	DCR 1236 Part 2-Boric Acid Heat Tracing (BAHT) BAHT Transformer (BAHT) Evaluation	May 8, 1984
C10659	Maximum Working Pressure of RHR Pump Seal Heat Exchanger	Revision 0
C10678	1992 Service Water Flow Test Analysis	Revision 0
C10809	KNPP Containment Pressure and Temperature Transients Following a Design Basis LOCA or a 3 ft2 Pump Suction Break	Revision 0
C10915	Safeguard Diesel Generator Loading Adjustments for Operation at Frequencies Other than 60 Hertz	September 10, 2002
C10920	Component Cooling Water System Margin in Post-LOCA Containment Sump Recirculation Mode	Revision 0
C10952	Performance Evaluation of Component Cooling Heat Exchanger under Off-Design Conditions	Revision 0
C10972	Evaluation of Component Cooling in Support of Component Cooling Pump A Replacement	Revision 0
C11053	Evaluate the Acceptability of the Throttled Positions of Valves CC-402A and CC-402B	Revision 1
C11247	480V Safety Related Circuit Breakers; Control Voltage Calculation	March 21, 2002

Number	Title	Revision/Date
C11344	Document the Results of SW System Testing Performed during the Fall 2001 Outage under SOP-SW-02-16 and SOP-SW-02-17	Revision 0
C11352	Evaluation of As-Found Piston Settings for Snubbers Inside Containment	Revision 0
C11353	Determination of CCW Pump delta-P Acceptance Criteria for use in SP 31-168	Revision 0
C11355	Minimum Desired Component Cooling Flow to the Letdown Heat Exchanger	Revision 0
C11356	CC Pump Motor Operation at 280HP	January 25, 2002
C11357	Evaluate the Ability of a Lower Lake Temperature to Compensate for Reduced CC Flow to an RHR Hx	Revision 0
C11359	Component Cooling Flow Evaluation of 02-1932	Revision 0
C11359	Determine Minimum RHR Hx CC Flow Rate and Refine SW Temperature Restriction Based on SOP-CC-31-18	Addendum A
C11376	Determine Acceptable SW Flow to Component Cooling Water Heat Exchanger	Revision 0
C11176	Determination of Available SW to the CCW Hx A with SW-1300A throttled Further Closed	Revision 0
C11195	Maximum Pressure Drop on Component Cooling Heat Exchangers	Revision 0
C11321	Instrument Allowable Value for Foxboro 63U Alarm Relays	Revision A
C11357	Evaluate the Ability of a Lower Lake Temperature to Compensate for Reduced CC Flows to RHR Hx	Revision 0
C11357	Identify Approved Reference Documents for References 5.1, 5.2, and 5.3	Addendum A
C11359	Component Cooling Flow Evaluation of 02-1932	Revision 0
C11359	Determine Minimum RHR Hx Flow Rate and Refine SW Temperature Restriction Based on SOP-CC-31-18	Addendum A
C11376	Determine Acceptable SW Flow to Component Cooling Water Heat Exchanger	Revision 0
C11376	Evaluate CCW Flow to CCW Hx during Cont. Sump Recirculation	Addendum A
C11380	Condensate and Feedwater Model	Revision 0
C11396	Effect of Sleeving and 50 Equivalent Rugged Tubes in the Component Cooling Heat Exchangers	Revision 0
C11396	Address 120F Maximum Service Water Outlet Temperature during Post-LOCA also identified in C11376 and Add Revision Number to a Referenced Calculation	Addendum A
C11396	Document Acceptability of CCW Hx Plugging/ Sleeving Configuration	Addendum B
C11398	CC Hx Tube Sleeve DP	Revision 1
C11399	Evaluation of Partial Tube and Sleeve Repair for the CC Hx	Revision 0
C11400	NEP4.10 Evaluation of Piping Changes Associated with DCR 3413	Revision 0

Number	Title	Revision/Date
C11401	CC Hx Tube Sleeve Leakage	Revision 0
C11402	CC Hx Analysis and Evaluation by EFCO	Revision 0
C11409	CC System Flow Model Development	Revision 0
C11432	Emergency Makeup to CCS	Revision 0
C11443	Containment Thermal Hydraulic Response to Design Basis Analysis (DBA) Loss of Coolant Analysis (LOCA) with Reduced Component Cooling System (CCS) Flow	Revision 0
C-038-003	125 VDC Safeguard Distribution Network Cable Voltage Drops	Revision 5
C-042-001	Safeguard Diesel Generator Loading (Addendum A)	April 22, 2002
ER 31-003	Throttle Valve Position Control	December 18, 1991
ESR 90-104	Evaluate DC Distribution to Diesel Generators	September 27, 1990
ESR 93-100	Component Cooling Surge Tank Level	Revision 0
GMP-238	MOV Thrust and Torque Evaluations - FW-12A	August 31, 2001 September 24, 2001
GMP-238	MOV Thrust and Torque Evaluations - CC-612A	November 1, 2002
M-1052-1	Kewaunee Plant Outside Shield Building Safeguard and Important to Safety Equipment Area Temperatures Following a LOCA Inside Containment	Revision 1
	Minimum Flow Study for Pump Graham Seal Cooler Performance	July 10, 1992

Condition Report Documents Reviewed During the Inspection

KAP 97-622	IST Acceptance Criteria for ESF Pumps	February 7, 1997
KAP 00-001414	Ground Perturbation on 5/10/00 Causes Short Lived Loss of Voltage	May 10, 2000
KAP 00-002566	Design Basis Information for SW and SW Components Difficult to Locate	July 13, 2000
KAP 00-003120	Various Alarms-SW-1306A and B Failed Open	September 3, 2000
KAP 01-018695	SW-1306A/B Failures	November 20, 2001
KAP 01-018732	SW-1306B Fails Open During SP-33-10	November 24, 2001
CE 009496	Calculation C10920- CCW Pump Analyses & Assumptions	March 10, 2000
CAP002818	PS 26018, (CC Pmps 1A/1B Low Dish Press Backup Pump Start/Low Alarm) Drift	May 9, 2000
CAP002706	CC-4A Handwheel Broke Free When Valve Closed	October 16, 2000
CAP002684	AC/DC Load Forms Misplaced	November 17, 2000
CAP002008	Documentation on the Results of the Kewaunee Flooding Study is Incomplete	June 21, 2001
CAP008327	Pressure Setting of Some CCW Thermal Relief Valves do no Account for Sufficient Backpressure	August 3, 2001
OTH002449	CCW Temperature Could Reach 39F During an Event or an SI Signal	August 30, 2001
CAP007760	Relief Valves Disassembled Prior to As-found Tests	October 31, 2001
CAP000844	CFC Tube Life Unknown Due to Material Change	November 7, 2001

Number	Title	Revision/Date
CAP000761	SW-1306A Actuator Adjustment	November 15, 2001
CAP000646	SW-1306A/B Failures	November 21, 2001
ACE000100	SW-1306A/B Failed Open During performance of SOP-ELV-40-8	November 21, 2001
MRE000082	Maintenance Rule Evaluation for Valves SW-1306A/B Failures	November 21, 2001
CAP000656	SW-1306B Fails Open During SP-33-110 Testing	November 24, 2001
ACE000103	Apparent Cause Evaluation for Valve SW-1306B Failure During Test SP-33-110	November 24, 2001
MRE000084	Maintenance Rule Evaluation for Valve SW-1306B Failure During Test SP-33-110	November 24, 2001
CAP000587	Complete 1993 Calculations C-038-009 & 010	November 29, 2001
CAP000588	Calculation C-038-011 125VDC Battery Duty Cycle for Battery C & D Has No Acceptance Criteria	November 29, 2001
CAP007663	FW-12B Fails Timing Test Following DCR 3325	December 3, 2001
CAP000503	Lack of Operations Administrative Guidance	December 6, 2001
CAP000145	Design Change versus Systematic Approach to Training	January 15, 2002
CAP000074	Possible CC Pump Runout on LOOP and Single Failure	January 23, 2002
CE 000061	Condition Evaluation per CAP000074	January 23, 2002
CA 000070	Install Valve travel Limiter on Valve CC-302	January 24, 2002
CA 000071	Install Ultrasonic Flow Meters on RHR HX A & B CC Piping	January 24, 2002
CAP002927	Snubber FDW-H114 Appears to Be Bottomed Out and Carrying Load	January 28, 2002
CA 000073	CC-302 AOV Program Scoping and Categorization Process	February 7, 2002
CAP003114	Perform Maintenance Rule (a)(1) Evaluation for SW-1306A/B Valves	February 12, 2002
CAP003191	Inadequate Procedure	February 20, 2002
CAP011530	CC System Leak Developed following Flush of CC Hx	May 2, 2002
CAP011556	Evaluate B CCW Hx Condition After finding Tube Cracks in A CCW Hx	May 5, 2002
CAP011560	USAR Changes Involving Plant Design Load Change Capability Require 50.59 Review	May 6, 2002
CAP011582	CCW Hx A Tube Leaks	May 7, 2002
CAP011828	System 31 Maintenance Rule (a)(1) Evaluation Required	June 7, 2002
CAP011972	CCW Accident Flow Rate for CC-3A(B) not Specified in Test Procedure	June 20, 2002
CAP012001	SW-1306A and SW-1306B Opened due to Electrical Transient	June 24, 2002
CE010129	SW-1306A and SW-1306B Opened due to Electrical Transient	June 25, 2002
CAP012029	ECP Concern	June 25, 2002
CAP012174	Shoto Substation Capacitor Bank Problem	July 9, 2002

Number	Title	Revision/Date
MRE001523	Maintenance Rule Evaluation for Valves SW-1306A/B Failures	July 9, 2002
CE010241	Shoto Substation Capacitor Bank Problem	July 10, 2002
MRE001526	Shoto Substation Capacitor Bank Problem	July 10, 2002
CAP012211	Perform Maintenance Rule Evaluation on Failure - 6/23/02	July 12, 2002
CAP012212	NAO Discovered that Hose House #2 South of Main Transformers Was Not Sealed	July 12, 2002
CE10063	Perform a Condition Evaluation Per CAP011928"	July 17, 2002
CAP012631	Evaluate CC Pump Check Valve Slam and Method to Avoid it	August 19, 2002
RCE-576	Root Cause Evaluation - Tube Leaks Identified in Component Cooling Water Heat Exchanger	August 27, 2002
CAP012749	Predicted CC Flow for Components Supplied is Less than Documented Requirements	August 28, 2002
CAP012800	Calculation Error	September 3, 2002
CAP012942	Seal Water Heat Exchanger Component Cooling Outlet Flow Indicator Pegged High	September 15, 2002
CAP012993	Final Configuration of CCW Hxs Not Specifically Addressed in DCR Package	September 18, 2002
CA 00861	Ensure That Affected Operations Procedures Will Be Revised as Stated in CA 007724	September 20, 2002
CAP013087	QA Vault Missing 5 CCW Records	September 25, 2002
CAP013094	Insufficient Description in Calculation C10266	September 25, 2002
CAP013104	CC Surge Tank Level XMTR 24041 Drift and Nonlinearity	September 26, 2002
CAP013119	SSDI CCW Missing Documents	September 27, 2002
CAP013137	Adequacy of Heat Exchanger Configuration Control	September 30, 2002
CAP013177	Current Status of Numerous System 31 Calculation not Readily Apparent	October 3, 2002
CAP013209	Potential USAR Discrepancy Regarding Hi Flow Alarm on CC Return Flow From a RXCP	October 7, 2002
CAP013212	Set Point Discrepancy for SI Pump Low Flow Alarm	October 8, 2002
CAP013220	Post Accident Analysis Flow Rate Assumption for CCW HX	October 8, 2002
CAP013269	Component Cooling Water System IST Acceptance Criteria	October 11, 2002
CAP013259	Revise calculation C11053	October 14, 2002
CAP013368	A Review of Calc. # C10510 Orig. Identified Several Issues	October 18, 2002
CE 10920	Condition Evaluation per CAP13269	October 15, 2002
CA 009118	Corrective Action for CE10920	October 29, 2002
ACE 001828	SW1306A/B Opens During Disturbances on External Electrical Grid	

Condition Reports Written as a Result of the Inspection

CAP013427	Axial IST Vibration Reading Not Taken on CCW Pumps	October 23, 2002
CAP013430	Apparent Lack of a UFSAR Discussion of the Maximum Allowable SW Temperature	October 23, 2002

Number	Title	Revision/Date
CAP013448	CC Heat Exchanger Performance Testing	October 24, 2002
CAP013454	Lack of Cooldown Analysis for Appendix R	October 24, 2002
CAP013456	Stress Intensification Factor	October 24, 2002
CAP013457	AS-Built Drawing Discrepancy for DCR 3413	October 25, 2002
CAP013471	Determine Adequacy of Scope of NEP 14.17 Evaluation for CC-612A & B	October 28, 2002
CAP013475	MOV Drawing Irregularities	October 28, 2002
CAP013477	Revise Calculation C11053 to Include Instrument Accuracy	October 28, 2002
CAP013500	Discrepancies in CII356 (CC Motor at 280 HP)	October 30, 2002
CAP013501	Design Description 3163 Discrepancy Found During SSDI	October 30, 2002
CAP013504	RHR Hx Transfer Surface Area	October 30, 2002
CAP013515	Revise Calculation No. 812.1179.P4	October 30, 2002
CAP013517	Component Cooling Surge Tank Level Loop 618 is not Calibrated Properly	October 31, 2002
CAP013523	50.59 (SE #02-06) Conclusion for TCR 02-02	October 31, 2002
CAP013530	Errors in NEP 4.9 Evaluations Discovered During SSDI	October 31, 2002
CAP013531	Lack of Calculation Indexing	October 31, 2002
CAP013532	Review Recent Calculation Errors and Discrepancies for Common Issues	October 31, 2002
CAP013561	No Guidance on the Effect of Low Temp CCW to the RXCP Thermal Barrier Post-SI	November 5, 2002
CAP013564	IPEOP Improvement	November 5, 2002
CAP013566	Full Flow Test Requirements for CC-3A(B)	November 5, 2002
CAP013567	Replacement Component Cooling Pump, Maximum Pump Head Determination	November 5, 2002
CAP013572	CCW SSDI - Update Calculation 611.1128.M1, as Reference for Relief Flow Rate	November 5, 2002
CAP013574	Relief Valve CC-611A(B) Required Capacity Discrepancy	November 5, 2002
CAP013575	Evaluate Manual Valve Maintenance in the CCW System	November 5, 2002
CAP013580	Problems Identified Under ICPs May not be CAP'd	November 6, 2002
CAP013581	Review to Determine If Any DG Loads May be Removed	November 6, 2002
CAP013582	NEP 4.9 Recommendations Needs to Be Formalized	November 6, 2002
CAP013584	CC System Flow Balancing	November 6, 2002
CAP013588	Post Installation Vibration Data for CCW Pumps	November 6, 2002
CAP013592	Inadequacy of RHR Pump Seal Cooler Max Operating Pressure Calculation	November 6, 2002
CAP013593	Discovered Drawing Discrepancy	November 7, 2002
CAP013594	'Z' Dimensions for Snubbers	November 7, 2002
CAP013607	Accuracy of UFM Measurements	November 7, 2002
CAP013608	Areas of DGs SP testing for TS4.6.a that need revision	November 7, 2002
CAP013805	Questions on SW-1306A/B Separation and Failure Impact on Reactivity	November 25, 2002
CAP014584	Inadequate 50.59 Evaluation	February 4, 2003

Number	Title	Revision/Date
<u>Design Change Requests</u>		
DCR 955	Modify the Logic to CC-610A and B Valve	June 17, 1980
DCR 1560	Remove Relief Valve on Comp. Cooling Tnk. & Vent Tnk. Using Existing Vent Line	February 15, 1988
DCR 2283	Replace Instruments 26309, 26310, 25015 and 35016	January 2, 1988
DCR 2603-1	Evaluate Connection of Static Trip II Replacement Relays for Six Breakers	May 17, 1993
DCR 2728	Replacement of Westinghouse BFD Relays	October 7, 1994
DCR 3055	Replace RCS Flow Transmitters	May 28, 2002
DCR 3128	Replace Component Cooling Pumps	March 30, 2001
DCR 3163	Modify Controls for Valves SW 1300 A(B) and SW 1306A(B) on an SI Signal	October 3, 2000
DCR 3325	Upgrade FW12A & FW12B Actuators	August 26, 2001
DCR 3331	Interposing Relays for Control Room Status Lights	March 21, 2002
DCR 3355	Reactor Coolant Pump (RXCP) Overcurrent Relay Setting	September 11, 2002
DCR 3412	CCW Heat Exchanger Tube Sleaving	May 11, 2002
TCR 02-15	Install Data Acquisition Equipment to CC-302	August 29, 2002
<u>Drawings</u>		
110E001, Sh. 3	Auxiliary Coolant System Engineering Flow Diagram	Revision 12
206C927, Sh. 6	Line List Auxiliary Coolant System	Revision 1
237127A-E2492	Schematic Diagram-Control Valves CV-31406,31407	Revision D
237127A-M326	Auxiliary Coolant Piping Sheet 1 of 3	Revision AC
237127A-M360	Reactor Bldg. Piping - Chem. & Vol. Control, Auxiliary Coolant & Safety Injection	Revision R
237127A-M361	Reactor Bldg. Piping - Chem. & Vol. Control, Auxiliary Coolant & Safety Injection	Revision X
834823-M-1423	2" SW Emergency Makeup to CC Isometric	Revision 1
E-204	Integrated Logic Diagram Component Cooling System	Revision AK
E-235	Circuit Diagram 480V SWGR.-Safeguard Buses	Revision AJ
E-240	Circuit Diagram 4160V & 480V Power Sources	Revision AQ
E-567	Motor Control Center 1-52B and 1-62B	Revision T
E-604	W/D Motor Control Center 1-52B (Sh.2)	Revision AS
E-614	W/D Motor Control Center 1-62E	Revision AK
E-615	W/D Motor Control Center 1-62E (Sh.2)	Revision BG
E-625	External Connection Motor Operated Valves Sh.4	Revision AC
E-627	External Connection-Motor Operated Valves Sh.6	Revision BJ
E-778	W/D Sequence Loading Panel DR116 Train B	Revision AV
E-799	W/D Technical Cabinet TC 1956	Revision DY
E-1082	Control Schematic 480V Breakers 15108 & 15109	Revision T
E-1089	Control Schematic 480V Breakers 166108 & 16109	Revision S
E-1345	Schematic Diagram M.C.C. 1-52B Motors 1-102	Revision M

Number	Title	Revision/Date
E-1349	S/D MCC 1-52B Motors 1-399	Revision AC
E-1351	W/D External Connection Sol. Valves TB's 1357, 1358, 1360 and 1391	Revision AJ
E-1404	S/D MCC 1-62B Motors 1-584 and 1-763	Revision U
E-1425	S/D MCC 1-62E Motor 1-364 MCC 1-62B Motor 1-364	Revision S
E-1427	Schematic Diagram MCC 1-62E Motors 1-446	Revision F
E-1531	W/D Ext. Conn. Sol. & Cont. Valves TB's 1357, 1358, 1360, & 1391	Revision AJ
E-1540	S/D Solenoid Valves SV33077, 78, 80, 81, 82 and 83	Revision L
E-1621	Integrated Logic Diagram DG Mechanical System	Revision AH
E-1632	Integrated Logic Diagram Service Water System	Revision AH
E-1637	Integrated Logic Diagram Diesel Generator Electric	Revision W
E-1638	Integrated Logic Diagram Diesel Generator Electric	Revision V
E-1639	Integrated Logic Diagram Diesel Generator Electric	Revision M
E-1815	W/D Mechanical Control Console "C" View "B" CR104	Revision AJ
E-1816	W/D Mechanical Control Console "C" View "C" CR104	Revision AQ
E-1828	W/D Mechanical Vertical Panel A View B CR106	Revision AJ
E-1830	W/D Mechanical Vertical Panel "A" View "C" Lower CR106	Revision BM
E-1832	W/D Mechanical Vertical Panel "A" View "D" Lower CR10	Revision BN
E-1876	Schematic Diagram Load Shedding Train "A"	Revision P
E-1877	Schematic Diagram Load Shedding Train "A"	Revision T
E-1881	Schematic Diagram Sequence Loading Bus 1-5	Revision P
E-1912	Schematic Diagram Solenoid Valves SV 33074 and 75	Revision G
E-2026	Integrated Logic Diagram Chemical and Volume Control System	Revision Q
E-2045	Integrated Logic Diagram Component Cooling System	Revision AC
E-2055	Integrated Logic Diagram Component Cooling System	Revision M
E-2105	External Connection Sol. and Cont Valves TB 1351 and 1363	Revision CK
E-2116	W/D Sol. and Cont. Valves TB 1372	Revision S
E-2112	W/D Sol V/V/S Cont. V/V/S and Dampers TB-1371, 1377, 1378, 1458	Revision V
E-2198	S/D Sol. Valves 3343301, 2, 4, 33769 and 33770	Revision F
E-2233	Relay Settings Sh.33	Revision F
E-2234	Relay Settings Sh.34	Revision G
E-2243	Relay Settings	Revision L
E-2244	Relay Settings	Revision L
E-2358	W/D Fuse Panel RR172 AC Normal 1 Dist.	Revision AQ
E-2359	W/D Fuse Panel RR173 AC Normal 2 Dist.	Revision BE
E-2492	Schematic Diagram - Control Valves CV-31406, 31407	Revision G
E-2545	Instrument W/D Component Cooling Flow Return & Component Cooling Heat Exgrs 1A/1B Outlet Temp.	Revision E
E-2551	Instrument W/D Reactor Coolant Sys Flow-Loop A	Revision C

Number	Title	Revision/Date
E-2565	Instrument W/D Reactor Coolant Sys Flow-Loop B	Revision C
E-2566	Instrumentation W/D Reactor Coolant Sys Flow- Loop B	Revision C
E-2567	Instrumentation W/D Reactor Coolant Sys- Flow Loop B	Revision D
E-2568	Instrumentation W/D Reactor Coolant Sys Flow - Loop A	Revision C
E-2569	Instrumentation W/D Reactor Coolant Sys Flow - Loop B	Revision E
E-3106	Integrated Logic Diagram Component Cooling System	Revision G
M-328	Auxiliary Coolant Piping	Revision AF
XK-100-18	Flow Diagram Auxiliary Coolant System	Revision AL
XK-100-19	Flow Diagram Auxiliary Coolant System	Revision AE
XK-100-20	Flow Diagram Auxiliary Coolant System	Revision T
XK-100-61-1	KNPP Component Cooling Surge Tank	Revision 4A
XK-100-622	Interconnection Wiring Diagram Rack R2 WPS Nuclear Power Plant Reactor Protection System	Revision 2L
X-K100-717	Relief Valve	Revision A1
X-K100-731	Relief Valve	Revision A1
<u>Miscellaneous</u>		
031-014	SSFI Documentation Sheet - Normal Heat Load Calcs for CC Water Hx Review	September 26, 1990
D-31-047	SSFI Documentation Sheet - Review of Calculation "Component Cooling Heat Exchanger"	October 4, 1990
D-31-081	SSFI Documentation Sheet - CCW Low Pressure Alarm and CCW Pump Auto-Start Setpoint	October 19, 1990
D-31-099	SSFI Documentation Sheet - CC Hx Capacity	October 12, 1990
D-31-099	SSFI Documentation Sheet - CCW System Relief Valve	October 18, 1990
ER-031-012	Evaluation - Component Cooling Water Heat Exchanger	March 13, 1993
ER-031-013	CCW Pump - Low Pressure Alarm Setpoint	April 15, 1991
ER-031-023	SSFI Evaluation Sheet - CCW System Relief Valve Testing	April 19, 1991
Form U-1	Manufacturers' Data Report - Item AH-CC550 (CCW HX)	N/A
FSD/SS-M-3357	Westinghouse Letter - Component Cooling Water System Safety Review Committee Finding	July 13, 1984
K100-2557	Westinghouse Instruction Manual - Auxiliary Heat Exchangers	N/A
KP-S-2213	Pioneer Letter - Auxiliary Coolant Valves	March 1, 1972
KP-W-1455	Pioneer Letter - Component Cooling System - Component Pressure Drops	May 11, 1972
	Pioneer Memorandum - Berzins to Hickey - Component Cooling System Set-point Change (FIA-26602)	March 28, 1973
NSC-KP-M-SLR-83	Pipe Rupture Analysis - Component Cooling System	April 17, 1972
OEA 93-204	Recirculation Phase Design Issue	January 31, 1996
OEA 97-056	NRC Information Notice 1996-031	July 10, 1997
R-31-012	Request for Information - CC Heat Exchanger	October 25, 1990

Number	Title	Revision/Date
R-31-013	Request for Information - CCW Low Pressure Alarm and CCW Pump Auto-Start Setpoint	October 18, 1990
R-31-023	Request for Information - CCW System Relief Valve Test	October 23, 1990
RESP-031-012	Request for Information Response	April 22, 1993
RESP-031-013	Request for Information Response	April 15, 1991
Section 4.6	PRA Component Cooling Water System Notebook	August 29, 2002
SER Section 8.3	On-site Power System-AC Power System	July 14, 1972
SER Section 9.3.2	Component Cooling System	July 24, 1972
SSEP-13-1	Operating Conditions Evaluation - OPS Valve No. CC-612A	Revision Original
SSEP-13-1	Operating Conditions Evaluation - OPS Valve No. CC-601B	Revision Original
SSEP-13-1	Operating Conditions Evaluation - OPS Valve No. CC-601A	Revision Original
SSEP-13-1	Operating Conditions Evaluation - OPS Valve No. CC-612B	Revision Original
System No. 31	KNPP System Description - Component Cooling Water System (CC)	Revision 2
UCR # R18-006	USAR Change Request (UCR) No. R18-006 / Pending USAR Change for DCR # 3412	October 1, 2002
	SW-1306A and SW-1306B Control Circuit Evaluation	January 6, 2003
	EQ Temperature Profile for Containment	N/A
	Component Cooling Water System (CC) Design Basis System Functional Matrix	Draft
	System Health Report - Component Cooling	September 2002
	Kewaunee Inservice Testing Program	
	AOV Ranking Worksheets CC610A/B	Revision 0
	CCW Pumps Inservice Testing Hydraulic and Vibration Data -2000 through 2002	
<u>Preoperational Tests</u>		
CC-1	Component Cooling Water Initial Fill & Operation	October 16, 1973
CC-2	Component Cooling Water Cold Functional Testing	November 5, 1973
CC-3	Component Cooling Water Hot Functional Testing	November 1, 1973
<u>Procedures</u>		
A-CC-31	Abnormal Component Cooling System Operations	Revision A
A-CC-31A	Abnormal Conditions in the Component Cooling System	Revision 0 (deleted)
A-CC-31B	Leakage Into Component Cooling System	Revision I (deleted)
A-SW-02	Abnormal Service Water System Operation	Revision S

Number	Title	Revision/Date
DC/PM 3128-2	CC Pump "A" Installation - Retest	08-28-01
DC/PM 3128-4	CC Pump "B" Installation - Retest	08-28-01
E-CC-31	Loss of Component Cooling	Revision L (deleted)
E-0	Reactor Trip or Safety Injection	May 30, 2002
E-0-06	Fire in Alternate Fire Zone	Revision O
E-1	Loss of Reactor or Secondary Coolant	Revision N
ECA-0.0	Loss of All AC Power	Revision Y
ECA-0.1	Loss of All AC Power Recovery Without SI Required	Revision M
ECA-0.2	Loss of All AC Power Recovery With SI Required	Revision L
ECA-1.2	LOCA Outside Containment	Revision I
ES-1.2	Post LOCA Cooldown and Depressurization	Revision M
ES-1.3	Transfer to Containment Sump Recirculation	Revision S
GNP-04.03.01	Guide to Safety Review, Safety Evaluations and Second Level Reviews	Revision A
GNP-04.03.02	Plant Physical Change Screening	Revision C
GNP-04.03.03	Plant Physical Change Control	Revision D
GNP-04.03.04	Calculation - Preparation, Review, and Approval	Revision D
GNP-04.04.01	50.59 Applicability Review and Pre-Screening	Revision B
GNP-04.04.02	50.59 Screening and Evaluation	Revision A
GNP-06.02.01	Procurement Technical Evaluation Administration	Revision B
GNP-06.02.02	Procurement Technical Evaluation Procedure	Revision C
ICP 31-02	CC - Flow Indicators Calibration	Revision K
N-CC-31	Component Cooling System Operation	Revision X
N-CC-31-CL	Component Cooling System Prestartup Checklist	Revision W
N-RC-36A	Reactor Coolant Pump Operation	Revision AA
N-SW-02	Service Water System	Revision W
NAD-04.03	Plant Physical Changes	Revision D
NAD-04.04	Changes Tests and Experiments (10CFR50.59)	Revision B
NAD-06.02	Procurement Technical Evaluations Program	Revision D
NEP-04.16	Piping Configuration Reconciliation to Comply with IEB 79-14	Revision B
SP-33-110	Diesel Generator Automate Test	Revision AC
SP-42-04A	Diesel Generator "A" Operated Test	Revision S
SP-42-047B	Diesel Generator "B" Operated Test	Revision U
SP-42-312A	Diesel Generator "A" Availability Test	Revision R
SP-55-177	Inservice Testing of Pumps Vibration Measurements	Revision Y
SP-168A	Train A Component Cooling Pump and Valve Test - IST	Revision Original
SP-168B	Train B Component Cooling Pump and Valve Test - IST	Revision Original
47024-H	CC Surge Tank Level High/Low	Revision C

Procurement Technical Evaluation

PTE 92-0154	Diode for Diesel Generator	February 19, 2002
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Number	Title	Revision/Date
PTE 92-0186	Service Water Pump Parts	Revision 24
PTE 92-0196	Brass Whitey Valves	Revision 7
PTE 93-0031	Oils, Greases and Lubricants	Revision 29
PTE 94-0009	Crosby 3/4 Inch JMAK Spec Type B Relief Valves	Revision 3
PTE 00-0023	Component Cooling Heat Exchanger Parts	Revision 3
PTE 01-0058	Anchor Darling 3" 150 lb. Flex-Wedge Gate Valves	Revision 1
PTE 02-0016	Upgraded Gaskets for the RCP	Revision 0
PTE 02-0022	Lever Pin for Anchor-Darling 6" Swing Check Valve	Revision 0
PTE 02-0025	ASCO Solenoid Valves - Model 8342	Revision 0
<u>Specifications</u>		
S3397-1	Main Feedwater Flow Control Valves Trim Replacement	June 5, 2002
NEP 4.9	Electrical Load Addition DCR-3190	November 4, 2002
No. 2003	Specification for Piping Design	Revision 9
ES-9010	Cable Installation and Separation Criteria	March 21, 1987
E-Spec 676257	Westinghouse- CC System Relief Valves, Sheet 19	Revision 3
E-Spec 676257	Westinghouse- CC System Relief Valves, Sheet 2	Revision 4
<u>Surveillances (Date Shown Is Date Surveillance Was Completed)</u>		
CMP-31-02, GMP 137	(CC) Component Cooling Water Heat Exchanger Cleaning (QA-1) - Performed for CC Hx A	March 18, 1993 March 17, 1994 April 12, 1994 April 14, 1995 October 31, 1995 November 14, 1995 September 30, 1996 April 30, 2000 September 13, 2001
CMP-31-02, GMP 137	(CC) Component Cooling Water Heat Exchanger Cleaning (QA-1) - Performed for CC Hx B	March 12, 1993 April 17, 1994 April 10, 1995 September 25, 1995 October 2, 1995 October 2, 1996 May 4, 2000 September 13, 2001
DCR 2468	Service Water Flow Test Train A	April 8, 1992
ICP 31-01	CC - Surge Tank Level Loop 618 Calibration	October 29, 1999 February 1, 2001 September 25, 2002
ICP 31-04	CC - Heat Exchanger 1A/1B Flow Loop 619 Calibration	March 5, 1999 September 6, 2000 February 26, 2002
ICP 31-05	CC - Pumps 1A/1B Discharge Header Pressure Indicator Controller 26018 Calibration	May 5, 2000 March 19, 2001 June 25, 2002

Number	Title	Revision/Date
ICP 31-11	CC - Heat Exchanger 1A/1B Outlet Temperature Loop 621 Calibration	August 14, 1998 January 19, 2000 July 16, 2001
SOP-CC-31-1	Component Cooling Flow Test	January 5, 1993
SOP-CC-31-17	CC Flow Measurement - Post CC-302 Limiter Installation	January 26, 2002
SOP-CC-31-18	CC Flow Measurement thru Both RHR Hxs with CC-302 Full Open	March 21, 2002

10 CFR 50.59 Evaluations

DCR 3128	Replace Component Cooling Pumps	March 30, 2001
DCR 3163	Modify Controls for Valves SW 1300 A(B) and SW 1306A(B) on an SI Signal	Revision 1
SE 01-56	Upgrade the ICCMS train A and B Modems to Eliminate Self Coupling	November 15, 2001
SE 01-64	DCR 3260	November 28, 2001
SE 02-01	CC Pump Operation with Two Pumps Running	January 11, 2002
SE 02-02	SOP-CC-31-16 & TCR 0201	January 25, 2002
SE 02-03	SOP-CC-31-16, Rev ORIG	January 24, 2002
SE 02-04	SOP-CC-31-17, Rev ORIG	January 26, 2002
SE 02-06	TCR 02-02, Bypass Forebay Low-Low Level CW Pump Trip	March 1, 2002
SE 02-07	SOP-CC-31-18, Rev ORIG	January 25, 2002

10 CFR 50.59 Screenings

DCR-3128	Replace Component Cooling Pumps	March 30, 2001
SCRN 02-003	DG Loading Calculation Revisions	April 22, 2002
SCRN 02-012	ES-1.3 / Revision S	April 30, 2002
SCRN 02-033	DCR 3413	May 9, 2002
SCRN 02-034	DCR 3412, CCW Heat Exchanger Tube Sleeving	May 8, 2002
SCRN 02-040	Revision to C10915 Rev 3	September 9, 2002
SCRN 02-061	Replace Trim in Main Feedwater Regulating Valves	July 17, 2002
SCRN 02-069	DCR 3350 Replace AFW Check Valves	July 22, 2002
SCRN 02-075	PTE 02-0016, Revision 0	June 20, 2002
SCRN 02-115	DCR/PM 3394	September 13, 2002
SCRN 02-120	Revision to C10032 Rev 1	September 16, 2002
SCRN 02-121	Revision to C-038-003 Rev 5	September 16, 2002

Technical Specifications

Section 3.6	Containment Systems	Amendment # 155
Section 3.3.d	Component Cooling System	Amendment # 116
Section 4.6	Periodic Tests of Emergency Power System	Amendment # 119

Updated Safety Analysis Report

Section 5.3	Reactor Containment Vessel Isolation Systems	Revision 16
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Number	Title	Revision/Date
Section 8.2	Electrical Systems	Revision 17
Section 9.3	Auxiliary Coolant System	Revision 17
Section 9.6	Facility Services	Revision 17
Table 5.2-2	Reactor Containment Vessel Penetrations	Revision 16
Table 6.2-7	Residual Heat Exchangers Design Parameters	Revision 16
Table 6.2-9	Shared Functions Evaluation	Revision 16
Table 8.2-1	Diesel Generator Load (Max.) for DBA	Revision 17
Table 9.3-1	Component Cooling System Component Data	Revision 17
Table 9.3-2	Residual Heat Removal System Component Data	Revision 16
Table 9.3-3	Spent Fuel Pool Cooling System Component Data	Revision 17
Table 9.3-4	Auxiliary Coolant System Code Requirements	Revision 16
Table 9.3-5	Auxiliary Coolant System Failure Analyses	Revision 17
Table 11.2-7	Radiation Monitoring System Channel Data	Revision 17
Table 14.3.4-19	LOCA Containment Response Analysis Parameters	Revision 17
<u>Vendor Manuals</u>		
	Ingersoll-Dresser Component Cooling Water Pumps	March 2001
91456	Controlotron Field Manual System 1010P Uniflow Universal Portable Flowmeter	