March 28, 2003

Mr. Fred Dacimo
Vice President - Indian Point Nuclear Generating Station
Entergy Nuclear Operations, Inc.
295 Broadway, Suite 1
Post Office Box 249
Buchanan, NY 10511-0249

SUBJECT: INDIAN POINT 2 - NRC INSPECTION REPORT 50-247/03-004

Dear Mr. Dacimo:

On February 14, 2003, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Indian Point 2 Nuclear Power Plant. The enclosed report presents the results of that inspection, which were discussed with you and members of your staff on February 14, 2003.

The inspection examined activities conducted under your license as they relate to safety system design and performance capability of the offsite power and the component cooling water systems, compliance with the Commission's rules and regulations, and with the conditions of your license. The inspection consisted of system walkdowns; examination of selected procedures, drawings, modifications, calculations, surveillance tests and maintenance records; and interviews with site personnel.

Overall, the team found the offsite power and the component cooling water systems were capable of performing their intended functions. We noted that you continue to apply significant resources to the design basis information upgrades, and some improvements were found during this inspection. In particular, we found that the electrical load flow calculation was nearing completion and was developed using a sound methodology. However, based on our review of the component cooling water system updated design basis information, we found some problems with the calculation roadmap developed as part of a design basis initiative (DBI) project. While we found the system calculation roadmap overall useful, the DBI effort was not fully effective in identifying and retrieving certain design information as described in the report. The NRC plans to conduct a regulatory performance meeting in early summer to further evaluate progress in your DBI efforts.

Based on the results of this inspection, the team identified one finding that was evaluated under the risk significance determination process as having very low safety significance (Green). In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public

Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Lawrence T. Doerflein, Chief
Systems Branch
Division of Reactor Safety

Docket No. 50-247
License No. DPR-26

Enclosure: Inspection Report 50-247/03-004
w/Attachment: Supplemental Information

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.	50-247
License No.	DPR-26
Report No.	50-247/03-004
Licensee:	Entergy Nuclear Operations, Inc.
Facility:	Indian Point 2 Nuclear Power Plant
Location:	Buchanan, New York 10511
Dates:	January 27 - February 14, 2003
Inspectors:	W. Schmidt, Senior Reactor Analyst, Division of Reactor Safety (DRS), Lead H. Gray, Senior Reactor Inspector, DRS M. Gray, Senior Reactor Inspector, DRS T. Hipschman, Reactor Inspector, DRS J. Talieri, Reactor Inspector, DRS P. Torres, Reactor Engineer, Division of Reactor Projects (in training) O. Mazzoni, NRC contractor
Approved By:	Lawrence T. Doerflein, Chief Systems Branch Division of Reactor Safety

Summary of Findings

IR 05000247/03-004; 01/27/03 - 02/14/03, Indian Point 2 Nuclear Power Plant; Safety System Design and Performance Capability.

The inspection was conducted by six region-based inspectors and one NRC contractor. One finding of very low safety significance (Green) was identified. 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 may 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.

Cornerstone: Barrier Integrity

- Green. The team identified a finding regarding the scheduled inservice test (IST) of a Component Cooling Water (CCW) system pressure relief valve that was inadvertently not performed during the last plant refueling outage. Access and testing of this valve normally requires the plant to be shutdown.

  This finding was not a violation of applicable technical specifications for IST because the timing of the team’s questions identified this issue to Entergy personnel while the test was within the allowed test interval extension. However, the issue was more than minor because, if left uncorrected, improperly tracked relief valve tests could result in a more significant safety concern because the valves would not be tested as required to ensure their reliable operation to provide CCW piping over-pressurization protection during accident conditions and maintain the CCW containment penetration barrier integrity. The finding was determined to be of very low safety significance (Green) because there was no actual open pathway in the physical containment structure. (Section 1R21b. 1.1)

Report Details

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R21 Safety System Design and Performance Capability (IP 71111.21)

a. Inspection Scope

The team reviewed the Indian Point 2 (IP2) design and performance capability of the offsite electrical power system, the component cooling water (CCW) system, and selected interfacing and supporting systems. Using risk insights, the team focused inspection activities on components and procedures that would minimize a loss of offsite power (LOOP) or a loss of CCW initiating event, and mitigate the effects of postulated accident sequences.

Offsite Electrical Power:

The offsite electrical power system provides the normal supply of power to the safety-related 480 volt (V) busses when the turbine generator is offline (plant shutdown or following a main generator/turbine trip). IP2 has two technical specification (TS) required offsite sources; the 138 kilovolt (kV) and 13.8 kV sources. During plant operation, the 138 kV is the normal source through the station auxiliary transformer to the 6.9 kV busses 5 and 6. The 6.9 kV busses 1, 2, 3 and 4 are normally fed from the main generator through the unit auxiliary transformer. Safety-related 480 V busses 2A, 3A, 5A, and 6A are normally fed from 6.9 kV busses 2, 3, 5, and 6, respectively, through their individual unit auxiliary transformers. Following a main turbine/generator trip, the 1, 2, 3 and 4 6.9 kV busses transfer to the 138 kV power source. If the main turbine/generator trips and the 138 kV source is not available to supply power, the three emergency diesel generators (EDGs) automatically start to supply power to the 480 V safety busses. Additionally, if the 138 kV source is unavailable, a manual feed from the 13.8 kV offsite source is available to supply the 480 V safety related busses. Furthermore, portions of the 13.8 kV source are designed to supply the alternate safe shutdown source (ASSS) of power in the event of a postulated fire that requires a control room evacuation and loss of normal power supplies.

Component Cooling Water

The CCW system is designed to remove heat from certain safety and non-safety components under both normal and accident conditions. These components include:

- Reactor coolant pumps (RCP) (thermal barrier and motor bearing oil coolers)
- Charging pumps
- Residual Heat Removal (RHR) pumps
- RHR heat exchangers

- Safety Injection (SI) pumps
- SI recirculation pump motor coolers
- Spent Fuel Pit heat exchanger

CCW is a closed system with the CCW pumps taking suction from the cooling water return header and sending this flow to the shell side of the CCW heat exchangers, and then to the cooled components. The heat removed from these components is transferred to the service water system (SWS). The CCW system consists of three 100% capacity CCW pumps, two CCW heat exchangers, a surge tank, and associated valving and instrumentation. Additionally, the system includes three CCW circulating booster pumps associated with the SI pumps, and two auxiliary component cooling (ACC) booster pumps associated with the SI recirculation pump motor coolers. The circulating water pumps are shaft driven off their respective SI pump, while the ACC pumps are motor driven. During normal plant operation, one CCW pump and two CCW heat exchangers are in operation. Make-up to the system is provided manually as needed from the primary water system.

The CCW pumps, by design, do not automatically start during the initial injection phase of a postulated design basis loss of coolant accident (LOCA) coincident with a loss of offsite power. Instead, CCW cooling flow is provided to the operating SI pumps by their associated circulating pumps. The ACC pumps operate during initial injection to provide CCW cooling flow to the SI recirculation pump motor coolers located in the containment structure. The CCW pumps are manually started during the postulated accident recirculation phase to maintain cooling flow to these pumps and additional selected heat loads. Additionally, CCW removes core decay heat by cooling the residual heat removal (RHR) heat exchangers. Portions of the CCW system that penetrate the containment receive isolation signals during accident conditions.

The emergency core cooling pumps serviced by CCW are provided with alternate back-up cooling sources in the event cooling from CCW is unavailable. The primary water and city water systems can be manually aligned to cool RHR and SI pump heat loads via a temporary hose connection. The charging pumps can be cooled by the city water system through a valve arrangement.

For the offsite power and CCW systems, the team reviewed design and licensing basis documents to understand the system safety functions and regulatory requirements. The documents reviewed included the applicable technical specifications, safety analysis report, IP2 licensing submittals and NRC safety evaluations, calculations, engineering evaluations, IP2 design basis documents (DBDs), plant modification packages, piping and instrumentation drawings, electrical schematics, instrumentation and control drawings, logic diagrams, and instrument setpoint documentation.

The team interviewed cognizant operators, system engineers, design engineers, and work control personnel regarding the system design, operation, and performance. Plant system operating procedures, emergency operating procedures, alarm response procedures, and valve line-up lists were reviewed to determine that they adequately controlled the plant configuration and supported operator actions assumed in the design basis. Likewise, plant walkdowns were completed of accessible portions of the CCW, 138 kV, 13.8 kV, 6.9 kV, 480 V, and supporting systems to verify operators could manipulate equipment consistent with design basis assumptions. Control room and local indications were also observed to determine that the parameters were within expected ranges, and that these indication ranges and setpoints were adequate to prompt operator actions as assumed in the design basis.

The plant walkdowns were further used to verify the physical installation was consistent with the design basis. The team used the updated final safety analysis report (UFSAR), technical specifications, design drawings, and operating procedures as references to verify the physical installation and line-up were consistent with design bases assumptions for major components, including piping, piping supports, pumps, valves, heat exchangers, instrumentation, and circuit breakers. Furthermore, during these walkdowns, the team evaluated the material condition of the plant to determine whether Entergy personnel were adequately identifying and correcting material equipment problems.

The team reviewed IP2 system health reports and maintenance rule monitoring data to evaluate the reliability of these systems and determine whether system safety functions were being maintained highly reliable consistent with the design basis. System issues described in the CCW and offsite power/ASSS system health reports were discussed with cognizant engineers to ensure that design related problems were being evaluated and corrected. Select corrective maintenance work orders and condition reports were also reviewed to determine that design problems were being identified and addressed.

A sample of CCW and electrical component periodic surveillance test procedures were reviewed for pumps, valves, instrumentation, and breakers to ensure the tests demonstrated the required component functions, and that the acceptance criteria were consistent with design basis assumptions. Completed surveillance tests were reviewed to verify that acceptance criteria were met, and that problems identified through testing were corrected. The team similarly reviewed select post maintenance testing results to verify that after maintenance activities, equipment was being tested consistent with the design prior to return to service.

Finally, the team evaluated the status and effectiveness of in-process IP2 design basis initiatives (DBI's) as they applied to the CCW and offsite electrical power systems. For CCW, the team reviewed the CCW calculation "roadmaps" and referenced vendor calculations and analyses to determine the effectiveness of the roadmap in capturing the CCW design basis. The team also reviewed the status of DBI electrical calculations being completed to ensure the assumed design basis margins were maintained in the offsite power system.

b. <u>Findings</u>

1. <u>Component Cooling Water Issues</u>

1.1 Tracking of Inservice Testing of Relief Valves

Introduction: The team identified a finding of very low safety significance (Green) regarding an inservice test (IST) of a CCW pressure relief valve that was inadvertently not performed during the last plant refueling outage. This finding was not a violation of applicable technical specifications for IST because the problem was identified during the inspection while the test interval was in the allowed 25% interval extension time period.

Description: The CCW RCP thermal barrier cooling outlet relief valves (783A, B, C, D) are located on the outlet of each of the four RCP thermal relief CCW return lines inside containment. These valves have a safety function to open to provide CCW piping over-pressurization protection during loss of coolant accident (LOCA) conditions, and to re-close to maintain CCW inventory. Based on these safety functions, Entergy personnel included these valves in the IST program in May 1998. These relief valves are normally tested only during plant shutdown. Entergy personnel successfully tested relief valve 783A in June 1998.

The ASME Code Section XI, OM Section 1.3.4.1 (b) for pressure relief valves states that all valves of each type and manufacture shall be tested within each subsequent ten-year period, with a minimum of 20% of the valves tested within any 48 months. The next test of valve 783B, C, or D was due to be completed by June 10, 2002, so at least one of these valves should have been tested during the last two IP2 plant refueling outages (2R14 or 2R15).

However, in response to the teams request for relief valve testing results, Entergy personnel determined that work orders credited for IST testing of these valves during the last two refueling outages did not test the valves. The work orders only removed the relief valves to assist in testing of other unrelated check valves. Entergy entered this issue into its corrective action program as condition report (CR) 2003-00589. Since the IST program allows extension of the testing interval for up to 25%, the relief valves remained within the testing interval until June 2003. At the end of the inspection, Entergy personnel were considering options to either test this relief valve, submit a relief request, or evaluate and revise the scope of their IST program.

Analysis: This issue was more than minor because, if left uncorrected, improperly tracked IST relief valve tests could result in a more significant safety concern because the valves may not be tested as required to ensure their reliability. This issue affects the barrier integrity cornerstone because the CCW thermal barrier relief valve safety function is to open during accident conditions to ensure that isolated CCW piping penetrating the containment does not fail. However, the finding screened to very low safety significance (Green) in SDP Phase I because there was no actual open pathway in the physical containment structure. Additionally, the one relief valve that was previously tested (783A) performed in a satisfactory manner. Since the relief valves were within their testing allowance (25% grace period), no violation of regulatory requirements occurred. Entergy entered this issue into its corrective action program in

CR 2003-00589. **FIN 50-247/2003-004-01** - Ineffective Tracking of Inservice Testing of Relief Valves

1.2 Basis for Functionality of Primary Water (PW) and City Water (CYW) as Backup Cooling Water Sources.

Introduction: The team identified an unresolved item (URI) concerning the lack of formal calculations or testing results to show that the PW or CYW were capable of providing backup cooling to CCW heat loads as described in the safety analysis report.

Description: In reviewing the IP2 safety analysis report and referenced drawings, the team determined that the emergency core cooling pumps cooled by CCW were provided with alternate back-up cooling sources in the event cooling from CCW was unavailable. The PW and CYW systems could be manually aligned by procedure to cool RHR and SI pump heat loads via a temporary hose connection. The charging pumps could be cooled by CYW through a procedurally controlled valve arrangement. However, the team determined that there were not calculations, engineering evaluations, or test results to demonstrate the capability of PW or CYW to adequately cool these emergency core cooling pump heat loads.

Enforcement: In response to these questions, Entergy personnel initiated CR 2003-00852 and CR 2003-00860. This item is unresolved pending further information on the adequacy of the CCW back-up cooling sources to emergency core cooling pump heat loads. **URI 50-247/2003-004-02** - Lack of Basis for Functionality of Backup CCW Water Sources

1.3 Basis for Minimum Required Component Cooling Water Flow to the Recirculation Pump Motor Coolers and the Safety Injection Pump Coolers

Introduction: The team identified issues regarding the basis for the minimum flow required to the SI recirculation pump motor coolers and the SI pump coolers during design basis accident conditions. These issues are tracked as one unresolved item pending licensee verification of the minimum flow requirement bases. The two related issues are described separately below:

Description:

SI Recirculation Pump Motor Cooler Flow Requirements: The design basis for the minimum motor cooler flows were derived from a re-analysis of the CCW system (WCAP-12312) completed for IP2 to allow for increased SWS supply temperatures. The analysis assumed CCW throttle valves to the motor coolers were set to provide 40 gpm per cooler (80 gpm total) with a single ACC pump operating. The analysis allowed for a degraded ACC pump and concluded the CCW flow could be as low as 37 gpm per cooler to maintain the SI recirculation motors operable during long term accident conditions. The team reviewed completed procedures and verified the CCW throttle valves to the SI recirculation motor coolers were set consistent with the design. During this review, the team identified several concerns:

- It was unclear how cited containment fan motor cooler testing documented in WCAP-7829 (Containment Fan Cooler Motor Test) provided an acceptable basis for CCW flows and temperatures to the SI recirculation pump motor cooler. The team reviewed WCAP-7829 and questioned how cooling water temperatures recorded during testing were extrapolated to bound the SI recirculation motor design, and the maximum CCW temperatures and flows in the IP2 design basis.

- The control room alarm setpoint of 60 gpm for the combined low flow to both SI recirculation motor coolers did not ensure the minimum design flow of 80 gpm was provided.

- The team concluded the ACC pumps may have a safety function post-LOCA to boost flow to the recirculation coolers assuming one CCW pump is operating (design basis assumption). The IP2 UFSAR, Section 6.2.2.3.4 was revised based on IP2 safety evaluation 97-398EV, completed in February 1998, to indicate that the ACC pump function was no longer required to protect the SI recirculation motors during the short term injection phase of a postulated loss of coolant accident when the SI recirculation pump motors are not energized. The safety evaluation further concluded that the ACC pumps were not required during the post-LOCA recirculation phase, since sufficient cooling would be provided by one operating CCW pump. Entergy personnel removed the ACC pumps from the IST program and revised the UFSAR based on the safety evaluation. However, the team questioned the safety evaluation conclusions based on observations during the inspection of 80 gpm flow to both coolers with one CCW pump running and the ACC pump secured (normal alignment). The team observed that the 80 gpm would likely not be maintained post-LOCA after the residual heat exchangers were placed in service without an ACC pump boosting flow from one CCW pump.

  While the ACC pumps were not included in the IST program based on the safety evaluation, the team noted the ACC pumps were still required to be operable and were tested periodically in accordance with TS requirements.

Entergy personnel initiated several CR's as a result of the team's review: CR2003-0590 and CR 2003-0872 for procedural clarifications; CR 2003-00910 to review the safety function of the ACC pumps; and CR 2003-0911 to verify the design basis for the minimum CCW flow to the SI recirculation pump motor coolers.

SI Pump Minimum Cooling Flow Requirements: The CCW design basis document (DBD) indicated that the shaft driven circulating pump provides cooling flow to its associated SI pump lube oil cooler and mechanical seal and jacket coolers in parallel lines. The DBD further stated the circulating pump (without a CCW pump running) should deliver 4.5 gpm to the lube oil cooler and 22.5 gpm combined flow to the four other coolers. The DBD indicated that only lube oil cooling was required for pump operability. The SI pump operating without a CCW pump would be the condition in the injection phase following a design basis loss of coolant accident (DBLOCA). The IP2 CCW system operating procedure set the flow to the SI pumps at approximately 15 gpm each with only CCW running. The quarterly SI pump IST recorded as found flow values between 20 and 25 gpm prior to throttling to the IST test flow value of 20 gpm. These as found flows, measured during normal plant operation, were higher than they would be during the injection phase of a DBLOCA because a CCW pump was operating in addition to the circulating pump. The team identified the following issues:

- There was no test or evaluation to verify that the circulating pump operating alone could provide the required flow during the injection phase of the DBLOCA.

- The control room low alarm setpoint of 30 gpm for the combined CCW flow to the three SI pumps appeared too low to ensure that the minimum design flow was provided.

- The closed function of the three CCW check valves (750A, B, and C) downstream of the five SI coolers on each pump were not in the IST program. There was no specific test or evaluation to verify that if a single SI pump was running without a CCW pump, the backflow through installed check valves would not adversely affect the cooling.

Entergy wrote the following CRs as a result of the team's review: CR 2003-00912 to verify the design basis for the minimum CCW flow to the SI pump coolers and CR 2003-00625 to review the closed function of the CCW check valves (750A, B, and C).

Enforcement: These issues are unresolved pending Entergy's determination of the minimum flow requirements to the recirculation pump motor coolers and the SI pump coolers and the need to have the ACC pump and the CCW outlet check valve closed functions in the IST program. **URI 50-247/2003-004-03** - Lack of Basis for CCW Flow Requirements for the Recirculation and SI pumps.

2. Electrical Issues

2.1 Battery Sizing to Support the Alternate Offsite Power and ASSS Circuit Breaker Operation

Introduction: The team identified an unresolved item regarding the lack of sizing and load calculations for the Unit 1 DC battery system to ensure the operation of the control and protection circuits for 13.8 kV and 480 V circuit breakers used to provide the alternate offsite and ASSS power sources.

Description: Calculation FEX-00138-00, IP1 Battery #11 Sizing Calculation, dated August 30, 2000, relied on a previous calculation FEX-006, IP1 Battery #11 Sizing Calculation, dated January 18, 1990, for the loading cycle. However, the voltage profile was not calculated, and there was no evaluation made of the capability of load devices to operate from the battery. While the calculation of record indicated that the end-of-discharge voltage was 1.75 V per cell, this end-of-discharge voltage was not evaluated to ensure the batteries were capable of supplying all required load devices. Also, the team noted that there was not a calculation of the voltage drop along the cables connecting these devices back to the battery terminals. As a result, the team questioned whether it would be possible to operate the 13.8kV and 480V breakers from the control room, as described in the procedures, with a low battery bus voltage of 1.75 V. If the load devices connected to the battery required a higher end-of-discharge voltage than provided by the end-of-discharge voltage of 1.75V per cell assumed in the calculations, the calculated battery capability would be incorrect.

In response to the team's questions, Entergy personnel initiated condition report (CR) 2003-00887, and determined that, since the Unit 1 batteries were sized for a two-hour discharge, when only one hour discharge was necessary, the batteries were adequate. However, the team indicated that it was not clearly established that the mission time was to be only one hour. In addition, the calculated capacity was not known to be correct in the absence of a voltage profile evaluation of the available voltage at the load devices.

Enforcement: In response to the team's questions, Entergy personnel initiated CR 2003-00887 during the inspection to address this issue. This item was unresolved pending Entergy calculations and analysis to ensure the Unit 1 battery was capable of operating the control and protection circuits for the 13.8 kV and 480V circuit breakers. **URI 50-247/2003-004-04** - Lack of Calculation for Battery Sizing to Support the Alternate Offsite Power and ASSS Circuit Breaker Operation

4OA2 Identification and Resolution of Problems (IP 71152)

a. Inspection Scope

The team assessed whether Entergy personnel were identifying issues at the proper threshold and entering them in the corrective action program by reviewing a sample of CRs associated with the CCW and offsite power/ASSS systems. This included a review of issues identified during the design basis initiative (DBI) development of the CCW system DBD and calculation roadmaps, completed in late 2002, and the ongoing update of the electrical power design basis calculations. The team also focused on the basis for operability determinations generated as part of the electrical power load flow and associated degraded grid voltage calculations.

b. Findings and Observations

The team determined that Entergy personnel, in general, adequately described problems, evaluated the causes in sufficient detail, and completed timely and effective corrective actions. However, this review, along with the unresolved items discussed in the report, indicated that the DBI effort for the CCW design basis update was not fully effective in identifying and retrieving design basis information. For example, while the CCW system parameter roadmap matrix listed most heat loads serviced by CCW, it omitted SI pump heat exchangers and the SI recirculation pump motor coolers. Additionally, the CCW calculation hierarchy roadmap did not identify that calculations or test results were not available to support the capability of back-up CCW cooling sources to emergency core cooling pumps. Some of the calculations referenced in the roadmaps were not easily retrievable. Additionally, the team identified some documentation problems related to CCW testing and configuration that were described in CR 2003-00705 and 2003-00886, both initiated during the inspection based on the team's questions.

With regard to the DBI related electrical calculations, the team concluded the offsite power the load flow calculation was a long-term project and appeared to be using a sound process. The team did not disagree with reviewed operability determinations.

In addition, the team identified a concern with the timeliness of the corrective actions in CR 2001-5211, initiated in May 2001. This CR identified that the alignment of three CCW pumps to one CCW heat exchanger may result in flows greater than the heat exchanger design flow. The evaluation recommended that the CCW operating procedure be revised so that, in the event a CCW heat exchanger was removed from service, operators would place one of three CCW pump control room breaker switch in the "pull-out" position, to ensure that only two CCW pumps automatically start on an SI signal. However, at the time of the inspection, this procedure revision had not yet been completed. Subsequent to team questions regarding timeliness, design engineering personnel evaluated that this configuration was acceptable because the resulting CCW flows would remain below critical values that could cause flow induced vibration problems in the heat exchanger. The team concluded that the problem was minor because the CCW system had not been operated in this configuration since initiating the CR, and the configuration was subsequently determined to be acceptable.

4OA6 Meetings, Including Exit

.1 Management Meeting

The team presented the inspection results to Mr. F. Dacimo and other members of the licensee's staff at an exit meeting on February 14, 2003. The team reviewed some proprietary information during the inspection. This material was either returned to Entergy personnel or destroyed. The team verified that this inspection report does not contain proprietary information.

ATTACHMENT 1

SUPPLEMENTARY INFORMATION

Key Points Of Contact

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L. Burbige, Supervisor, Design Engineering
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V. Sacco, CYW, SWS System Engineer
D. Shah, RHR/SIS (ECCS) System Engineer
J. Tuohy, Manager, Design Engineering
M. Vasely, Supervisor, Systems Engineering
J. Baker, Shift Manager
A. Williams, Assistant Operations Manager

List of Items Opened, Closed, and Discussed

Opened

50-247/03-04-02	URI	Lack of Basis for Functionality of Backup CCW Water Sources (Section 1R21b. 1.2)
50-247/03-04-03	URI	Lack of Basis for CCW Flow Requirements for the Recirculation and SI pumps (Section 1R21b. 1.3)
50-247/03-04-04	URI	Lack of Calculation for Battery Sizing to Support the Alternate Offsite Power and ASSS Circuit Breaker Operation (Section 1R21b. 2.1)

Opened and Closed

50-247/03-04-01	FIN	Ineffective Tracking of Inservice Testing of Relief Valves (Section 1R21b. 1.1)

LIST OF ACRONYMS

AC	Alternating Current
ACC	Alternate Component Cooling
ARP	Alarm Response Procedure
ASSS	Alternate Safe Shutdown Source
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
CYW	City Water System
DB	Design Basis
DBD	Design Basis Document
DBI	Design Basis Initiative
DC	Direct Current
EDG	Emergency Diesel Generator
FIN	Finding
IA	Instrument Air
IST	Inservice Testing
kV	Kilovolt
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
NRC	Nuclear Regulatory Commission
P&IDs	Piping & Instrumentation Drawings
PW	Primary Water
RCP	Reactor Coolant Pumps
RHR	Residual Heat Removal
SDP	Significance Determination Process
SE	Safety Evaluation
SI	Safety Injection System
SOP	Special Operating Procedure
SWS	Service Water System
TS	Technical Specification
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
V	Volt

LIST OF DOCUMENTS REVIEWED

PROCEDURES AND SURVEILLANCE TESTS:

AOI 4.1.1, Loss of CCW
AOI 27.1.9, Control Room Inaccessibility Safe Shutdown Control
AOI 4.3, Loss of Spent Fuel Pool Cooling
AOI 4.1.2, Leakage Into CCW
AOP-CCW-1, Loss of CCW
AOP-RCP-1, Reactor Coolant Pump Malfunction
ARP, Panel SGF, Auxiliary Coolant System
CH-SQ-13.019, Chemistry Program for Sampling, Analysis, and Control of CCW - Sampling results October 2002- January 2003
COL 4.1.1, Check Off List, CCW
E-0, Reactor Trip or Safety Injection
E-1, Loss of Reactor or Secondary Coolant
ECA-0.0, Loss of All AC Power
ES-1.1, SI Termination
ES-1.3, Transfer to Cold Leg Recirculation
ISI UT results for CCW system - 1991 and UT results for Service Water to CCW Heat Exchanger Inlet and Outlet Valve Area - March 2002
PT-2Y10A, Number 21CCW Hx Testing and results of October 2002
PT-2Y10B, Rev 2. Number 22CCW Hx Testing and results of October 2002
PT-Q25A and B. Quarterly test for U2 IA cooling pumps
PT-Q29A, B, C, CCW pump Quarterly IST
PT-Q30A, 21 CCW pump
PT-R153, CCW Manual Valves Operability Test
SOP 4.1.2, CCW Operation
SOP 3.1, Charging, Seal Water, and Letdown Control
SOP 1.3, Reactor Coolant Pump Startup and Shutdown
SOP 4.3.1, Spent Fuel Pool Cooling
SOP 4.1.1 CCW Fill and Drain

DRAWINGS:

A227781-70, “Auxiliary Coolant System,” sheet 1
9321-F-2720-80, “Auxiliary Coolant System,” sheet 2
A251783-27, “Auxiliary Coolant System,” sheet 3
400236-00, “Component Cooling Water System, Calculation Hierarchy”
400237-00, “Component Cooling Water System, System Parameter Matrix”
9321-F-2567-3, “Auxiliary Coolant System Piping at Reactor Cooling Support Blocks”
A208088-38, “480 VAC Switchgears 21 & 22, Bus 2A, 3A, 5A & 6A”
9321-F-2746-42, “Isolation Valve Seal Water System”
A251783, UFSAR Fig. No. 9.3-1 Sht 3. Aux Cooling System (ACS) - RHR Pumps
A227781, UFSAR Fig. No. 9.3-1, Sht 1. ACS flow diagram, SIS Pumps
9321-F-2720, UFSAR Fig. No. 9.3-1, Sht 2. ACS
9321-F-2722, UFSAR Fig. No. 9.6-1, Sht 1. Service water flow
A209762, UFSAR Fig. No. 9.6-1, Sht 2. Service water flow
9321-F-2724, UFSAR Fig. No. 9.2-2, Primary makeup water system-NSSP
9321-F-2734, Flow diagram at Reactor Coolant Pumps
9321-F-2696, Primary Aux Bldg SA, CW and Drains

9321-F-2693, Primary Aux Bldg piping at Charging Pumps
H604839-102, TWS intake structure
1974M7663, Reactor Coolant Pump general assembly (for coolant flows)
B192505, City Water piping flow diagram. Sht 1. UFSAR Fig No. 9.6-5, Sht 1B192506, City Water piping flow diagram. Sht 2. UFSAR Fig No. 9.6-5, Sht 2.
B193183, City Water piping flow diagram. Sht 2. UFSAR Fig No. 9.6-5, Sht 3.

CALCULATIONS:

Westinghouse Proprietary Class 2 Calculation CWBS-C-222, "IPP CCWS Post-LOCA Evaluation," Revision 1, July 1989.

Westinghouse Proprietary Class 2 Calculation CWBS-C-212, "IPP CCWS Flow and Thermal for Power Operations & Post-Accident Conditions," June 1989.

Westinghouse Proprietary Class 2 Letter RFS-I-3054, Emergency Cooling to Safeguards Pumps, August 1969

Westinghouse Proprietary Class 2 Letter RFS-I-149 "Determine Sizes of Relief Valves for IP2 ACS .

Westinghouse Proprietary Class 3 WCAP-12312, "Safety Evaluation for an Ultimate Heat Sink Temperature Increase to 95F At Indian Point 2," Revision 0, July 1989, and portions draft, Revision 1, April 2002.

Westinghouse Proprietary Class 3 WCAP-7829, "Fan Cooler Motor Unit Test," April 1972.

Westinghouse Letter IPP-00-413, transmitting Safety Evaluation Check List SECL-00-164, "Indian Point Unit 2 Restart Support." December 2000,

Westinghouse Letter IPP-00-404,transmitting Westinghouse Proprietary Class 2C report "Ultimate Heat Sink Update Report for Consolidated Edison Indian Point Unit 2." December 2000

Westinghouse Letter IPP-01-114, transmitting Westinghouse Proprietary Class 2 report "An Additional Ultimate Heat Sink Update Evaluation Report for Consolidated Edison Indian Point Unit 2." June 2001

Westinghouse non-proprietary class 3 WCAP-12655, "Emergency Diesel Loading Study for Indian Point 2", May 1996.

OTHER DOCUMENTS:

"Indian Point Unit 2 Design Basis Document for the Component Cooling Water System," Revision 0, November 2001.

Consolidated Edison Letter dated July 13, 1989, "Application for License Amendment to Increase the Design Basis Inlet Temperature of the Service Water System," with attachment WCAP-12312.

Indian Point Unit No. 2 System Description No. 4.1, Component Cooling Loop, Revision 3, October 1993, (uncontrolled)

System Health Report, Component Cooling Water System, Second, Third, Fourth Quarter 2002.

IP2 Response to NRC IN 89-54: “Potential Over-pressurization of the Component Cooling Water System”

IP2 Preliminary Evaluation per 10CFR Part 21 Report of Condition No. 21-84-02

Memo dated 3/21/94, Vasely to Blatt on NRC IN 93-92, on evaluation and closure of industry identified CCW system issues.

Condition Report (CR) list for CCW system from 1/1/2001 to 1/14/03

System Health Reports for Service Water(Q4 ‘01), RHR (Q3 ‘02), SI (Q3 ‘02), and CVCS (Q3 ‘02).

Control Room Logs, July 2002 - January 2003

Operations Department Performance Indicators

Operator Round Sheets, July 2002 - January 2003

CONDITION REPORTS (* - Generated as result of inspection):

1997-04557	2003-00589*	2003-00876*
1998-04268	2003-00590*	2003-00886*
2001-07979	2003-00619*	2003-00887*
2001-08009	2003-00621*	2003-00891*
2001-10171	2003-00625*	2003-00905*
2002-06029	2003-00627*	2003-00906*
2002-10211	2003-00705*	2003-00910*
2002-10295	2003-00852*	2003-00911*
2002-11512	2003-00860*	2003-00912*
2003-00091	2003-00872*	2003-00913*
2003-00515	2003-00873*	
2003-00588*		

Work Orders:

1998-01329	2002-38733	2002-45166
2000-16117	2002-45154	2002-56060
2002-00881	2002-45164	