July 30, 2004

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION
NRC INTEGRATED INSPECTION REPORT 05000461/2004005

Dear Mr. Crane:

On June 30, 2004, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Clinton Power Station. The enclosed reports documents the inspection findings which were discussed on July 8, 2004, with Mr. R. Bement and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and to 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.

Based on the results of this inspection, four NRC-identified findings of very low safety significance (Green), two of which were determined to involve violations of NRC requirements, were identified. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these two violations as Non-Cited Violation (NCV)s consistent with Section VI.A of the NRC Enforcement Policy.

If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the US Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Regional Administrator, U.S. Nuclear Regulatory Commission - Region III, 2443 Warrenville Road, Suite 210, Lisle, IL 60532-4352; the Director, Office of Enforcement, US Nuclear Regulatory Commission, Washington, DC 20555-0001; and the Resident Inspector Office at Clinton Power Station facility.

In accordance with 10 CFR 2.390 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 NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Ann Marie Stone, Chief
Branch 3
Division of Reactor Projects

Docket No. 50-461
License No. NPF-62

Enclosure: Inspection Report No. 05000461/2004005
w/Attachment: Supplemental Information

cc w/encl: Site Vice President - Clinton Power Station
Plant Manager - Clinton Power Station
Regulatory Assurance Manager - Clinton Power Station
Chief Operating Officer
Senior Vice President - Nuclear Services
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
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Enclosure

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2004005
Licensee:	AmerGen Energy Company, LLC
Facility:	Clinton Power Station
Location:	Route 54 West Clinton, IL 61727
Dates:	April 1 through June 30, 2004
Inspectors:	B. Dickson, Senior Resident Inspector C. Brown, Resident Inspector D. Tharp, Resident Inspector R. Alexander, Radiation Specialist A. Dunlop, Senior Reactor Inspector J. Jacobson, Senior Reactor Inspector P. Lougheed, Senior Reactor Inspector T. Ploski, Senior Emergency Preparedness Inspector T. Tongue, Project Engineer R. Winter, Reactor Engineer D. Zemel, Illinois Department of Nuclear Safety Inspector
Observers:	J. Bond, Reactor Engineer D. Melendez-Colon, Reactor Engineer
Approved by:	A. M. Stone, Chief Branch 3 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000461/20040005, 04/01/2004 - 06/30/2004; Clinton Power Station; As Low As Reasonably Achievable Planning and Control and Event Follow-Up.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections on radiation protection, security, and maintenance effectiveness. The inspections were conducted by Region III specialist inspectors and resident inspectors. Four Green findings; two associated with Non-Cited Violations (NCVs), were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (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 sate operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. Inspector-Identified and Self Revealing Findings

Cornerstone: Mitigating Systems (MS)

- Green. A finding of very low safety significance was identified by the inspectors for the licensee's failure to implement a procedure to control locked valves. Failing to have a locked valve procedure, combined with a shift supervisor marking the step which verified the position of the standby liquid control (SLC) tank air-sparging valve as "not applicable," based on the valve being a "locked valve" and no work having been done to the valve, allowed the air sparging valve to remain mispositioned while transitioning to Mode-2 and during Mode-1 operations. Once identified, the licensee placed the valve in the correct position. This issue was related to the Human Performance crosscutting area, in that, the failure to implement a procedure resulted in a mispositioned valve.

  The finding was more than minor because the open air sparging valve created the potential for air-binding the pumps used to inject boron solution into the reactor, affecting the ability of the SLC system to shut the reactor down from a full power situation if the control rods failed to insert on a scram condition. The finding was of very low safety-significance because the deficiency, once evaluated, did not result in a loss of function per Generic Letter 91-18. The finding was a Non-Cited Violation of Technical Specification 5.4 which required the implementation of written procedures to control the locked valves in the plant. (Section 4OA3.1.b(1))

- Green. A finding of very low safety significance was identified by the inspectors for the licensee's failure to take timely corrective actions after discovering that the standby liquid control (SLC) tank air-sparging valve was in the wrong position for about 2 months. This resulted in the boron concentration in the tank being outside the Technical Specification allowed limits for greater than the Technical Specification allowed action time. Once identified, the licensee restored the concentration in the tank to within acceptable limits. This finding was related to the Problem Identification and Resolution crosscutting area, in that, the concentration in the tank remained outside limits due to the licensee's failure to identify the impact of evaporation on the solution.

The finding was more than minor because the boron concentration being outside the Technical Specification allowed range affects the cross-cutting attribute of SLC system performance and also affected the SLC system's availability, reliability, and capability of responding to plant events. The finding was of very low safety significance because the as-found concentration, although above technical specification limits, did not impact the safety function of the pumps. The finding was a Non-Cited Violation of 10CFR50, Appendix B, Criterion XVI which requires conditions adverse to quality be promptly identified and corrected. (Section 4OA3.1.b.(2))

Cornerstones: Occupational Radiation Safety (OS)

- Green. A finding of very low safety significance was identified by the inspectors when the collective dose for RWP No. 10002827, "Drywell SRV Replacement," exceeded 5 person-rem and exceeded the licensee's dose estimate by more than 50 percent. This finding was related to the Human Performance cross-cutting area, in that, radiation protection personnel did not adequately evaluate the radiological consequences of a first-time evolution (i.e., the enhanced cool-down process). The Problem Identification and Resolution cross-cutting area was impacted, in that, the licensee did not identify the increased contact dose rates, which resulted in unplanned, unintended occupational collective dose for the work activity in a timely manner. This resulted in the total collective dose for the RWP of 11.839 person-rem versus a reasonable re-estimate of 6.043 person-rem.

  This issue was determined to be more than minor in that it was associated with the As Low As is Reasonably Achievable (ALARA) planning/dose projection attribute of the Occupational Radiation Safety Cornerstone, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. The finding involved ALARA planning/work controls; however, the licensee's current 3-year rolling collective dose average was not greater than 240 person-rem per unit. Therefore, the finding was of very low safety significance. No violation of NRC requirements was identified. (Section 2OS2.1.b.(1))

- Green. A finding of very low safety significance was identified by the inspectors when the collective dose for RWP No. 10002830, "Drywell Main Steam and Feedwater Work," exceeded 5 person-rem and exceeded the dose estimate by more than 50 percent. This finding was related to the Human Performance cross-cutting area, in that, radiation protection personnel did not adequately evaluate the radiological consequences of a first-time evolution (i.e., the enhanced cool-down process). The Problem Identification and Resolution cross-cutting area was impacted, in that, the licensee did not identify the increased contact dose rates, which resulted in unplanned, unintended occupational collective dose for the work activity in a timely manner. This resulted in the total collective dose for the RWP of 5.405 person-rem versus an estimate of 1.455 person-rem.

  This issue was determined to be more than minor, in that, it was associated with the As Low As is Reasonably Achievable (ALARA) planning/dose projection attribute of the Occupational Radiation Safety Cornerstone, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation.

The finding involved ALARA planning/work controls; however, the licensee's current 3-year rolling collective dose average was not greater than 240 person-rem per unit. Therefore, the finding was of very low safety significance. No violation of NRC requirements was identified. (Section 2OS2.1.b.(2))

B. **Licensee-Identified Violations**

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

The plant was operated at about 91.5 percent rated thermal power (maintaining 100 percent rated electrical output) from the beginning of the inspection period until power was reduced to 45 percent for repairs to the 3B feedwater heater on May 9. On May 12, power was further reduced to 18 percent and the turbine was taken off line at 11:00 p.m. to facilitate the feedwater heater repairs. The licensee synchronized the turbine to the grid on May 16 at 6:45 p.m., and completed raising reactor power to 94.5 percent thermal (about 103 percent rated electrical power) at 11:29 a.m. on May 18, 2004. The plant was operated at this power through the remainder of the period.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, Barrier Integrity, and Emergency Preparedness

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

The inspectors verified that the licensee had completed seasonal preparations before hot weather presented a challenge. The licensee used Section 8.3, Restoration from Cold Weather of CPS 1860.01, "Cold Weather Operation," Revision 4e, to prepare for hot weather. The inspectors reviewed the licensee's completed procedure and verified that it adequately covered risk-significant equipment and ensured that the equipment was in a condition to meet the requirements of the Clinton Technical Specifications (TS), Operational Requirements Manual (ORM), and Updated Safety Analysis Report (USAR) with respect to protection from hot temperatures. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action system by reviewing the associated condition reports. Based on their importance for availability of mitigating systems, the inspectors conducted more detailed system reviews and walkdowns of selected systems. This activity represented one inspection sample.

The inspectors completed a second sample by walking the site down for possible wind-driven missiles and readiness for predicted high wind conditions on May 26, 2004.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04Q and 04S)

.1 Partial Walkdowns

a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of trains of risk-significant mitigating systems equipment during times when the trains were of increased importance due to the redundant trains or other related equipment being unavailable. The inspectors utilized the valve and electric breaker checklists listed at the end of this report to verify that the components were properly positioned and that support systems were lined up as needed. The inspectors also examined the material condition of the components and observed operating parameters of equipment to verify that there were no obvious deficiencies. The inspectors reviewed outstanding work orders and condition reports (CRs) associated with the systems to verify that those documents did not reveal issues that could affect train function. The inspectors used the information in the appropriate sections of the USAR to determine the functional requirements of the systems. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

The inspectors performed three samples by verifying the alignment of the following systems:

- Division 2 control room ventilation during Division 1 maintenance.
- Division 1 standby gas treatment system during Division 2 maintenance.
- High pressure core spray system during reactor core isolation cooling system maintenance.

b. Findings

No findings of significance were identified.

.2 Semi-Annual Complete System Walkdown

a. Inspection Scope

The inspectors conducted a complete system alignment inspection of the “A” residual heat removal (RHR) system. This system was selected because of its high risk significance and its mitigating systems function. The inspection was considered one inspection sample and consisted of the following activities:

- Reviewed plant procedures, drawings, and the USAR to identify proper system alignment;
- Reviewed the system valves, instrumentation, and electrical supplies to verify proper alignment, component accessibility, availability, and current material condition;
- Reviewed the CR database to verify that there were no current operability concerns;

- Reviewed open work orders (WOs) to verify that there were no conditions impacting availability and that deficiencies have been identified;
- Reviewed selected system abnormal operating procedures to verify system configuration control; and
- Reviewed operator work-arounds and operator challenges related to the system.

Documents reviewed during this inspection are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05Q)

a. Inspection Scope

The inspectors conducted fire protection walkdowns which were focused on availability, accessibility, and the condition of fire fighting equipment; the control of transient combustibles and ignition sources; and the condition and operating status of installed fire barriers. The inspectors selected fire areas for inspection based on their overall contribution to internal fire risk, as documented in the Individual Plant Examination of External Events with later additional insights, their potential to impact equipment which could initiate a plant transient, or their impact on the plant's ability to respond to a security event. The inspectors used the documents listed at the end of this report to verify that fire hoses and extinguishers were in their designated locations and available for immediate use; that fire detectors and sprinklers were unobstructed; that transient material loading was within the analyzed limits; and that fire doors, dampers, and penetration seals appeared to be in satisfactory condition. The inspectors verified that minor issues identified during the inspection were entered into the licensee's corrective action program.

The inspectors completed six fire protection samples for the following areas:

- Fire Zone F-1g through 1o - fuel building 737 foot level;
- Fire Zone T-1m and 1n - 800 foot turbine building;
- Fire Zone A-26, 707 foot auxiliary building - RHR 'A' pump and heat exchanger room;
- Fire Zone A-3f - 781 foot auxiliary building - Division 2, 4kV switchgear room;
- Fire Zone T-1a, 1b, and 1c - 712 foot turbine building - general access area, condensate booster pump, condensate pump room; and
- Fire Zone F-16 - 712 foot fuel building, ECCS floor drain sump, high pressure core spray (HPCS) pump room.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors verified that flooding mitigation plans and equipment were consistent with the design requirements and risk analysis assumptions. The inspectors walked down the screen house, auxiliary building, diesel building, and control building roofs to ensure compliance with the design for heavy rain events. Additionally, the inspectors toured the lake dam and emergency spillway areas and reviewed the results of storm drain inspection activities. The inspectors reviewed USAR Section 3.4.1 for external flooding events, reviewed condition reports and work orders on internal floor seals. The inspectors completed one sample on the following:

- Annual External Flooding Inspection.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11Q)

a. Inspection Scope

The inspectors reviewed licensed-operator requalification training to evaluate operator performance in mitigating the consequences of a simulated event, particularly in the areas of human performance. The inspectors evaluated operator performance attributes which included communication clarity and formality, timely performance of appropriate operator actions, appropriate alarm response, proper procedure use and adherence, and senior reactor operator oversight and command and control.

Crew performance in these areas was compared to licensee management expectations and guidelines as presented in the following documents:

- Simulator dynamic exam SE-LOT-26, Revision 0a, which included an incomplete Group I Isolation, coincident with high drywell pressure due to a main steam line leak and failure to autostart of high pressure injection systems.
- OP-AA-101-111, “Roles and Responsibilities of On-Shift Personnel,” Revision 0;
- OP-AA-103-102, “Watchstanding Practices,” Revision 2;
- OP-AA-104-101, “Communications,” Revision 1; and
- OP-AA-106-101, “Significant Event Reporting,” Revision 2

The inspectors also assessed the performance of the training staff evaluators involved in the requalification process. For any weaknesses identified, the inspectors observed that the licensee evaluators also noted the issues and discussed them in the critique at the end of the session. The inspectors verified all issues were captured in the training program and licensee corrective action process.

These activities completed one inspection sample.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness (71111.12B and Q)

.1 Quarterly Evaluation (71111.12Q)

a. Inspection Scope

The inspectors reviewed the effectiveness of the licensee's maintenance efforts in implementing the maintenance rule (MR) requirements, including a review of scoping, goal-setting, performance monitoring, short-term and long-term corrective actions, and current equipment performance problems. These systems were selected based on their designation as risk significant under the MR, or their being in the increased monitoring (MR category (a)(1)) group. Two inspection samples were completed by review of the following systems:

- Division 2 Hydrogen Oxygen Monitoring System.
- Area and Process Radiation Monitors.

b. Findings

No findings of significance were identified.

.2 Biennial Evaluation (71111.12B)

a. Inspection Scope

The inspectors reviewed the maintenance rule periodic evaluation report, which was required per 10 CFR 50.65 (a)(3). This evaluation was a periodic assessment of the effectiveness of maintenance for those structures, systems, and components (SSCs) included within the scope of the rule. For SSCs where maintenance has not been demonstrated as being effective, by either excessive failures or unavailability, the licensee monitors under (a)(1) of the rule, such that the SSCs receive the appropriate attention to correct deficiencies. The remaining SSCs where maintenance has been demonstrated as being effective, usually through the use of reliability and/or unavailability performance criteria, the licensee assesses under (a)(2) of the rule, to ensure the SSCs will continue to be able to perform their intended function. The objective of the inspection was to:

- Verify that the periodic evaluation was completed within the time restraints defined in 10 CFR 50.65 (once per refueling cycle, not to exceed 2 years), ensuring that the licensee reviewed its goals, monitoring, preventive maintenance activities, industry operating experience, and made appropriate adjustments as a result of that review;

- Verify that the licensee balanced reliability and unavailability for safety significant SSCs during the previous refueling cycle;

- Verify for SSCs being monitored under (a)(1) of the rule, that goals were being met, corrective actions were appropriate to correct the defective condition including the use of industry operating experience, and (a)(1) activities and related goals were adjusted as needed; and

- Verify that the licensee has established (a)(2) performance criteria, examined any SSCs that failed to meet their performance criteria, or reviewed any SSCs that have suffered repeated maintenance preventable functional failures including a verification that failed SSCs were considered for monitoring under (a)(1) of the rule.

The inspectors examined the periodic evaluation report for Cycle 9, which included the time frame of March 2002 through March 2004. To evaluate the effectiveness of (a)(1) and (a)(2) activities, the inspectors examined (a)(1) action plans, justifications for returning SSCs from (a)(1) to (a)(2), and a number of condition reports to evaluate the licensee's functional failure determinations. In addition, the condition reports were reviewed to verify that the threshold for identification of problems was at an appropriate level and the associated corrective actions were appropriate. The inspectors focused the inspection on the following systems (five samples):

- Instrument and Control Power;
- Switchgear Heat Removal;
- Reactor Core Isolation Cooling;
- Feedwater; and
- Low Pressure Core Spray.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation (71111.13)

a. Inspection Scope

The inspectors observed the licensee's risk assessment processes and considerations used to plan and schedule maintenance activities on safety-related structures, systems, and components particularly to ensure that maintenance risk and emergent work contingencies had been identified and resolved. The inspectors also walked down the clearance orders to verify proper alignment and reviewed associated condition reports. The inspectors completed four samples by assessing the effectiveness of risk management activities for the following work activities or work weeks:

- Reviewed system outage window for Division 1 standby liquid control system;
- Reviewed system outage window for RCIC system - WO 371987 Repair Air Leak on 1SX037 RCIC room cooler outlet valve;

- Reviewed licensee maintenance activities and assessment of risk associated with down power to 19 percent to repair 3B low pressure feed water heater; and
- Reviewed licensee risk assessment associated with replacing 1B21-N678A reactor pressure vessel pressure automatic trip module (WO 694 968).

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed operability determinations and evaluations affecting mitigating systems to determine whether operability was properly justified and the component or system remained available such that no unrecognized risk increase had occurred. The inspectors completed two samples of the operability determinations and evaluations by reviewing the following:

- Condition Report (CR) 224155, Torque Switch Out of Tolerance, dated May 27, 2004 and
- Operability evaluation associated with Action Requests 00221737 and 00219911, both issues related to control room ventilation 'A' degraded performance during 18-month TS required surveillance test.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed the post maintenance testing activities associated with maintenance or modification of important mitigating, barrier integrity, and support systems that were identified as risk significant in the licensee's risk analysis. The inspectors reviewed these activities to verify that the post maintenance testing was performed adequately, demonstrated that the maintenance was successful, and that operability was restored. During this inspection activity, the inspectors interviewed maintenance and engineering department personnel and reviewed the completed post maintenance testing documentation. The inspectors used the appropriate sections of the TS and USAR, as well as the documents listed at the end of this report, to evaluate this area.

The inspectors completed four samples by observing and evaluating testing subsequent to the following activities:

- Reviewed post maintenance testing on OPR13A, Standby Gas Treatment system cooler repair and relief valve replacement.
- Reviewed post maintenance testing for maintenance during VC 'A' outage.
- Reviewed diesel driven fire pump A battery replacement WO# 704735, CPS 9071.01 Diesel Driven Fire Pumps Operability Test, Revision 35d.
- Reviewed post maintenance test following replacement of RPV pressure analog trip module, 1B21-N678A.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors witnessed selected surveillance testing and/or reviewed test data to verify that the equipment tested using the surveillance procedures met the TS, the ORM, the USAR, and licensee procedural requirements, and demonstrated that the equipment was capable of performing its intended safety functions. The activities were selected based on their importance in verifying mitigating systems capability and barrier integrity. The inspectors used the documents listed at the end of this report to verify that the testing met the frequency requirements; that the tests were conducted in accordance with the procedures, including establishing the proper plant conditions and prerequisites; that the test acceptance criteria were met; and that the results of the tests were properly reviewed and recorded. In addition, the inspectors interviewed operations, maintenance and engineering department personnel regarding the tests and test results.

The inspectors completed four samples by evaluating the following surveillance tests:

- Reactor core isolation cooling cold operability per CPS 9054.01, RCIC System Operability Check, Revision 42a;
- Emergency diesel generator operability after shutdown service water piping replacement per CPS 9080.01, Diesel Generator 1A Operability - Manual and Quick Start Operability, Revision 49d;
- CPS 9067.01 Standby Gas Treatment System Train Flow/Heater operability; and
- RHR C Pump operability per CPS 9053.07, RHR B/C Pump and RHR B/C Waterleg Pump Operability, Revision 45b.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (71111.23)

a. Inspection Scope

The inspectors reviewed temporary plant modifications to verify that the instructions were consistent with applicable design modification documents and that the modifications did not adversely impact system operability or availability. The inspectors interviewed operations, engineering and maintenance personnel as appropriate and reviewed the design modification documents and the 10 CFR 50.59 evaluations against the applicable portions of the USAR. The documents listed at the end of this report were also used by the inspectors to evaluate this area.

The inspectors reviewed the issues that the licensee entered into its corrective action program to verify that identified temporary modification problems were being entered into the program with the appropriate characterization and significance. The inspectors also reviewed the licensee's corrective actions for temporary modification related issues documented in selected condition reports. The condition reports are specified in the Attachment.

The inspectors completed one sample by reviewing and evaluating the following temporary plant modification on risk-significant equipment:

- Operating control room ventilation with the door to the old operations support center (OSC) open.

b. Findings

No findings of significance were identified.

1EP2 Alert and Notification System Testing (71114.02)

a. Inspection Scope

The inspectors discussed with corporate and Clinton Station Emergency Preparedness (EP) staffs the operation, maintenance, and periodic testing of the Alert and Notification System (ANS) in the Clinton Station's Emergency Planning Zone (EPZ) to determine whether the ANS equipment was adequately maintained and tested in accordance with Emergency Plan commitments and procedures. The inspectors also discussed an enhancement to the EPZ's siren activation equipment that was made in late 2003. The inspectors reviewed records of preventive and non-scheduled maintenance activities for the period from mid 2002 through 2003, as well as mid 2003 through early 2004 ANS operability test results.

These activities completed one inspection sample.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization Augmentation (71114.03)

a. Inspection Scope

The inspectors reviewed and discussed with EP staff the procedures that included the primary and alternate methods of initiating an emergency response organization (ERO) activation to augment the on-shift ERO, plus provisions for maintaining the enlarged ERO's call-out roster. The inspectors also reviewed critiques and a sample of corrective action program records of unannounced, off-hours augmentation drills, which were conducted between July 2002 and March 2004, to determine the adequacy of the drills' critiques and associated corrective actions. The inspectors reviewed a 2004 Clinton Station newsletter that re-emphasized ERO expectations and provided refresher training on the primary and alternate notification methods for ERO members.

The inspectors reviewed two revisions of the ERO's training program procedure to assess enhancements made in the latest revision. The inspectors also reviewed the EP training records of a random sample of 50 Clinton Station ERO members, who were assigned to key and support positions, to determine whether they were currently trained for their assigned ERO positions.

These activities completed one inspection sample.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies (71114.05)

a. Inspection Scope

The inspectors reviewed Nuclear Oversight staff's 2002, 2003 and 2004 audits of the Clinton Station's EP program to verify that these independent assessments met the requirements of 10 CFR 50.54(t). The inspectors also reviewed a sample of critique reports and corrective action documents that were associated with the 2003 biennial exercise, as well as various EP drills conducted between July 2002 and December 2003 in order to verify that the licensee fulfilled its drill commitments and to evaluate the licensee's efforts to identify, track, and resolve concerns identified during these activities. The inspectors reviewed a 2003 focused area self-assessment on the facilities, equipment, procedures, and training associated with the licensee's emergency news organization.

These activities completed one inspection sample.

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed the emergency response activities associated with the drill conducted on June 23, 2004. Specifically, the inspectors verified that the emergency classification and simulated notifications were properly completed, and that the licensee adequately critiqued the training. The inspectors completed one sample for the emergency preparedness performance indicator drill in the technical support center.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety (OS)

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Plant Walkdowns and Radiation Work Permit (RWP) Reviews

a. Inspection Scope

The inspectors reviewed the RWPs for the C1R09 refueling outage work activities which had the potential for creating an airborne radioactivity area, which included:

- Drywell Control Rod Drive Exchange; and
- Reactor Disassembly and Reassembly Work in the Reactor Cavity.

The inspectors reviewed the RWPs to verify barrier integrity and engineering control contingency plans were in place and to determine if there was a potential for individual worker internal exposures of greater than 50 millirem committed effective dose equivalent. This and other work activities/areas having a history of, or the potential for, airborne transuranic isotopes were evaluated to verify that the licensee had considered the potential for transuranic isotopes and provided appropriate worker protection.

The inspectors assessed the adequacy of the licensee's internal dose assessment process by reviewing personnel contamination event logs (and associated dose assessments) for the C1R09 refueling outage. The inspectors specifically reviewed three internal dose assignments related to Reactor Cavity work activities, one which was greater than 50 millirem committed effective dose equivalent.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports, as available, related to the radiological access control program to verify that identified problems were entered into the corrective action program for resolution.

The inspectors evaluated the licensee's process for problem identification, characterization, prioritization, and verified that problems were entered into the corrective action program and resolved, focusing on radiological access control issues from the C1R09 refueling outage. For repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution, the inspectors reviewed the licensee's self-assessment activities to verify that they were capable of identifying and addressing these deficiencies. In particular, the inspectors discussed with the Radiation Protection (RP) supervisory staff the evaluation process for the corrective action documents characterized as "C1R09 Lessons Learned."

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified. However, findings and observations associated with dose control during the refueling outage are discussed in Sections 2OS2 and 4OA2.3.

.3 High Risk Significant, High Dose Rate-High Radiation Area (HRA) and Very High Radiation Area (VHRA) Controls

a. Inspection Scope

The inspectors held discussions with the RP Manager concerning high dose rate-HRA and VHRA controls and procedures, including any procedural changes that had occurred since the last inspection, in order to verify that any such modifications did not substantially reduce the effectiveness and level of worker protection.

The inspectors discussed with RP supervisors and technicians the controls that were in place for special areas that had the potential to become high dose rate-HRAs and VHRAs during certain plant operations, and to determine if these plant operations required communication beforehand with the RP group, so as to allow corresponding timely actions to properly post and control the radiation hazards.

The inspectors conducted plant walkdowns to verify the posting and locking of entrances to high dose rate-HRAs and VHRAs.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.4 Radiation Worker Performance

a. Inspection Scope

The inspectors reviewed radiological problem reports generated during or since the C1R09 refueling outage which found that the cause of the event was due to radiation worker errors to determine if there was an observable pattern traceable to a similar cause, and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems. These problems, along with planned and taken corrective actions, were discussed with RP supervisory staff.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

The inspectors reviewed radiological problem reports generated during or since the C1R09 refueling outage which found that the cause of the event was RP technician error to determine if there was an observable pattern traceable to a similar cause, and to determine if this perspective matched the corrective action approach taken by the licensee to resolve the reported problems.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls (71121.02)

.1 ALARA/Radiological Work Planning

a. Inspection Scope

The inspectors compared the results achieved including dose rate reductions and person-rem used with the intended dose established in the licensee's ALARA planning for 16 C1R09 refueling outage work activities. These 16 RWPs were reviewed in that each exceeded 5 person-rem collective dose for the RWP. Additionally, of the

16 RWPs, 12 exceeded their initial dose estimations by greater than 50 percent. Reasons for inconsistencies between intended and actual work activity doses were reviewed.

The inspectors compared the person-hour estimates, provided by maintenance planning and other groups to the RP group, with the actual work activity time requirements in order to evaluate the accuracy of these time estimates.

Shielding requests from the radiation protection group were evaluated with respect to dose rate reduction along with engineering shielding response follow up. The inspectors evaluated if work activity planning included consideration of the benefits of dose rate reduction activities such as shielding provided by water filled components/piping, job scheduling, and shielding and scaffolding installation and removal activities. Finally, the licensee's post-job (work activity) reviews were evaluated to verify that identified problems were entered into the licensee's corrective action program.

These reviews represented five inspection samples.

b. Findings

Two findings of very low safety significance were identified as described below:

(1) Introduction: One NRC-identified Green finding was identified when the collective dose for the RWP No. 10002827, "Drywell SRVs [Steam Relief Valves] Replacement," conducted during the C1R09 refueling outage, exceeded 5 person-rem and exceeded the dose estimation by more than 50 percent. No violation of NRC requirements was identified.

Description: During a review of the RWP package (including the ALARA/RWP Plan, Work-In-Progress (WIP) Reviews, and Post-Job Review), the inspectors identified that the licensee's initial dose estimate for the RWP was 4.483 person-rem. This estimate was primarily based on historical dose rates for the same work activities, and person-hour estimates provided by the maintenance groups responsible for the evolution. During the previous outage, all 16 of the station SRVs were replaced utilizing 8.237 person-rem. However, during C1R09, only one-half of the SRVs were to be replaced, and, as such, about 50 percent of the dose was expected to be expended.

About 3 days into the evolution, the licensee documented in WIP Review No. 1 (February 7, 2004) that 3.818 person-rem had already been expended with the vast majority (approximately 75 percent) of the work still to be completed. The licensee noted that pipe fitters encountered stuck bolts on the SRV exhaust flanges which required the bolts to be cut out, and resulted in approximately 1.56 person-rem of additional dose for this scope addition. However, the licensee also noted that insulators were authorized by the Outage Control Center (OCC) to begin removing insulation from the SRV before shielding package installation had been completed (though the dose "cost" for this decision was not quantified). Based on the added scope and the vast

majority of the work to be completed at that time, the RWP dose estimate was revised to 7.523 person-rem. However, the inspectors determined no other reasonable changes to the work scope were documented to justify this change in the dose estimate.

On February 9, 2004, the licensee documented in WIP Review No. 2 that the ALARA staff on the February 8 night shift identified that the workers replacing the SRVs were in direct contact with the main steam lines which had contact dose rates of 100 millirem per hour. These dose rates were up to 10 times the dose rates seen in these areas during previous outages. At that time, 7.571 person-rem had been expended with four SRVs remaining to be replaced. The RP personnel expedited a temporary shielding request to add shielding to the main steam lines in hopes to reduce dose rates by 50 percent or more. Based on the dose expended to that point, the amount of work remaining, and the recently-identified dose rate differences, the RWP dose estimate was revised to 11.963 person-rem. However, again, the inspectors determined no reasonable changes to the work scope were documented to justify this change in the dose estimate. Additionally, the licensee's recognition of the increased surface dose rates and actions to install temporary shielding were determined to be less than timely.

The Post-Job review documented that the increased dose rates seen on the main steam lines were, in part, the result of an enhanced cool-down process first implemented at the station during C1R09. This process, implemented by procedure CPS 3007.01, "Preparation and Recovery From Refueling Operations," raised the reactor water level to above the vessel flange shortly after the drywell head was removed, which in turn, flooded the main steam lines with reactor coolant water up to the main steam isolation valves. However, during the C1R09 shutdown, the station experienced a significant source term redistribution (i.e., crud burst), with a peak coolant total gamma activity of 9.55E-02 microcuries per milliliter. Therefore, when the main steam lines were filled with higher activity coolant during enhanced cool-down process, the main steam lines became several line-type radiation sources in and around the SRVs.

Through interviews and reviews of station operations and chemistry procedures, the inspectors determined that the review process which resulted in the procedure change to CPS 3007.01, did not adequately address the potential creation of sources of radiation depending on the activity concentration in the flood-up water. The Exelon Corporate Boiling Water Reactor Shutdown Chemistry procedure (CY-AB-120-130), addresses water activity acceptance criteria for reactor cavity flood-up to specifically minimize refuel bridge or shutdown cooling system dose rates; however, no such criteria were developed for the enhanced cool-down process.

Consequently, the total actual collective dose for RWP No. 10002827 was 11.839 person-rem. The inspectors determined that the only documented emergent work or work scope change to justify the dose estimate increase was the stuck bolts on the SRV exhaust flanges which were required to be cut out, resulting in 1.56 person-rem additional dose. Additionally, in that the licensee failed to adequately evaluate the potential ALARA/dose consequences of the enhanced cool-down process, the inspectors determined that any dose received due to dose rate increases constituted unintended collective dose. Therefore, the actual collective dose for RWP No. 10002827 exceeded 5 person-rem (11.839 person-rem), and exceeded the reasonable

re-estimate (6.043 person-rem) by more than 50 percent (i.e., 196 percent of the reasonable re-estimate).

Analysis: The failure to maintain collective doses ALARA is a performance deficiency. This issue was determined to be more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of ALARA planning/dose projection, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. This finding was related to the Human Performance cross-cutting area, in that, radiation protection personnel did not adequately evaluate the radiological consequences of a first-time evolution (i.e., the enhanced cool-down process). The Problem Identification and Resolution cross-cutting area was impacted, in that, the licensee did not identify the increased contact dose rates, which resulted in unplanned, unintended occupational collective dose for the work activity in a timely manner.

The inspectors determined, utilizing Manual Chapter 0609, Appendix C, "Occupational Radiation Safety SDP," that the finding involved ALARA planning/work controls, however, the licensee's current 3-year rolling collective dose average was not greater than 240 person-rem per unit. Therefore, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green).

Enforcement: Though the failure to maintain collective doses ALARA for RWP No. 10002827 was a performance deficiency, no violation of regulatory requirements occurred. This issue was considered a finding of very low safety significance (FIN 05000461/2004005-01). This issue was documented in the licensee's corrective action program as part of a broad evaluation of the C1R09 dose overage in Action Request (AR) 201183 and AR 216449.

(2) Introduction: One NRC-identified Green finding was identified when the collective dose for the RWP No. 10002830, "Drywell Main Steam and Feedwater Work," conducted during the C1R09 refueling outage, exceeded 5 person-rem and exceeded the dose estimation by more than 50 percent. No violation of NRC requirements was identified.

Details: During a review of the RWP package (including the ALARA/RWP Plan, WIP Reviews, and Post-Job Review), the inspectors identified that the licensee's initial dose estimate for the RWP was 1.455 person-rem. This estimate was primarily based on historical effective dose rates for the same work activities (1 to 5 millirem per hour), and person-hour estimates provided by the maintenance groups responsible for the evolution.

About 7 days into the evolution, the licensee documented in WIP Review No. 1 (February 10, 2004) that 1.316 person-rem had already been expended with a significant amount of the work (66 percent of the tasks) still to be completed. The licensee noted that there were no changes to the work scope at that time; however, dose rates in the drywell were higher than expected. Based on a new effective dose rate of 8 millirem per hour (60 percent greater) and the amount of the work to be completed at that time, the RWP dose estimate was revised to 3.183 person-rem.

However, the inspectors determined no reasonable changes to the work scope were documented to justify this change in the dose estimate.

On February 14, 2004, the licensee documented in WIP Review No. 2 that 2.734 person-rem had been expended with approximately 50 percent of the work still to be completed. WIP Review No. 2 reiterated that dose rates continued to be higher than expected. In particular, the licensee noted that work on the 1B21F016 valve had not yet commenced, but initial surveys indicated 50 millirem per hour dose rates for this valve. Based on the dose expended to that point, the amount of work remaining, and the dose rate differences, the RWP dose estimate was revised to 3.978 person-rem. However, the inspectors determined no reasonable changes to the work scope were documented to justify this change in the dose estimate.

On February 17, 2004, WIP Review No. 3 documented that 4.812 person-rem had been expended versus an approved estimate of 4.774 person-rem. The inspectors identified that there was no formal WIP review conducted between February 14 and 17, to document the increase in the approved dose estimate from 3.978 person-rem to 4.774 person-rem. Regardless, WIP Review No. 3 noted that approximately 65 person-hours of work on the 1B21F016 valve remained, requiring an estimated 1.160 person-rem. Therefore, the RWP dose estimate was revised to 5.972 person-rem. However, again, the inspectors determined no reasonable changes to the work scope were documented to justify this change in the dose estimate.

The Post-Job review documented that the increased dose rates seen during these work activities (in the general area of the main steam lines) was the consequence of the enhanced cool-down process implemented during C1R09, whereby reactor water was raised above the vessel flange and the main steam lines were flooded to the main steam isolation valves. Due to the significant crud burst realized during C1R09 shutdown, the enhanced cool-down process flooded the main steam lines with higher activity water creating the higher dose rates identified (as discussed in Section 2OS2.1.b.1). The Post-Job Review also documented significant excess in person-hours expended by the Electrical and Mechanical Maintenance groups and for management oversight as compared to the initial estimates provided (collectively 330 additional person-hours and 3.136 additional person-rem). An additional 316 person-hours and 1.385 person-rem were also expended on the RWP by individuals not assigned to a specific work group (and thus not explicitly planned for).

Consequently, the total actual collective dose for RWP No. 10002830 was 5.405 person-rem. The inspectors determined that no emergent work or work scope changes were documented to justify the dose estimate increase. Similar to the assessment for RWP No. 10002827, in that the licensee failed to adequately evaluate the potential ALARA/dose consequences of the enhanced cool-down process, the inspectors determined that any dose received due to dose rate increases constituted unintended collective dose. Additionally, the inspectors determined that a significant proportion of dose expended for the RWP was unspecified, indicating potential flaws in the station's job planning processes. Therefore, the actual collective dose for RWP

No. 10002830 exceeded 5 person-rem (5.405 person-rem), and exceeded the initial estimate (1.455 person-rem) by more than 50 percent (i.e., 372 percent of the initial estimate).

Analysis: The failure to maintain collective doses ALARA is a performance deficiency. This issue was determined to be more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of ALARA planning/projected dose, and affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation. This finding was related to the Human Performance cross-cutting area, in that, radiation protection personnel did not adequately evaluate the radiological consequences of a first-time evolution (i.e., the enhanced cool-down process). The Problem Identification and Resolution cross-cutting area was impacted, in that, the licensee did not identify the increased contact dose rates, which resulted in unplanned, unintended occupational collective dose for the work activity in a timely manner.

The inspectors determined utilizing Manual Chapter 0609, Appendix C, "Occupational Radiation Safety SDP," that the finding involved ALARA planning/work controls, however, the licensee's current 3-year rolling collective dose average was not greater than 240 person-rem per unit. Therefore, the inspectors concluded that the SDP assessment for this finding was of very low safety significance (Green).

Enforcement: Though the failure to maintain collective doses ALARA for RWP No. 10002830 was a performance deficiency, no violation of regulatory requirements occurred. This issue was considered a finding of very low safety significance (FIN 05000461/2004005-02). This issue was documented in the licensee's corrective action program as part of a broad evaluation of the C1R09 dose overage in AR 201183 and AR 216449.

.2 Source-Term Reduction and Control

a. Inspection Scope

The inspectors reviewed licensee records to determine the historical trends and current status of tracked plant source terms, and to determine if the licensee was making allowances and had developed contingency plans for expected changes in the source term due to changes in plant fuel performance issues or changes in plant primary chemistry.

The inspectors evaluated if the licensee had developed an understanding of the plant source-term, that this included knowledge of input mechanisms to reduce the source term, and that the licensee had a source-term control strategy in place. Elements of the licensee's program including a cobalt reduction strategies, shutdown ramping, and operating chemistry plan (all which are designed to minimize the source-term external to the core) were evaluated. Other methods used by the licensee to control the source term, including component and system decontamination, and use of shielding, were evaluated.

Finally, the inspectors reviewed the licensee's root cause evaluation conducted after the C1R09 refueling outage which examined causes of a significant source term redistribution realized in selected areas of the drywell during C1R09 (AR/RCE 201183).

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety (PS)

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System Description and Waste Generation

a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system description in the USAR and the 2003 Annual Radioactive Effluent Release Report for information on the types and amounts of radioactive waste (radwaste) generated and disposed. The inspectors reviewed the scope of the licensee's audit program with regard to radioactive material processing and transportation programs to verify that it met the requirements of 10 CFR 20.1101(c).

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walk-Downs

a. Inspection Scope

The inspectors performed walkdowns of the liquid and solid radwaste processing systems to verify that the systems agreed with the descriptions in the USAR and the Process Control Program, and to assess the material condition and operability of the systems. The inspectors reviewed the status of radioactive waste process equipment that was not operational and/or was abandoned in place. The inspectors reviewed the licensee's administrative and physical controls to ensure that the equipment would not contribute to an unmonitored release path or be a source of unnecessary personnel exposure.

Through review of documentation and discussions with the licensee's staff, the inspectors determined that no changes to the waste processing system had been made since the last inspection in this area which required a 10 CFR 50.59 evaluation. However, the inspectors reviewed the current processes for transferring waste resin into

shipping containers to determine if appropriate waste stream mixing and/or sampling procedures were used. The inspectors also reviewed the methodologies for waste concentration averaging to determine if representative samples of the waste product were provided for the purposes of waste classification in 10 CFR 61.55.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Waste Characterization and Classification

a. Inspection Scope

The inspectors reviewed the licensee's radiochemical sample analysis results for each of the licensee's waste streams, including the Phase Separator, Spent Resin, Waste Sludge, Dry Active Waste (DAW), Fuel Pool Sludge, and Concentrated Waste. The inspectors also reviewed the licensee's use of scaling factors to quantify difficult-to-measure radionuclides (e.g., pure alpha or beta emitting radionuclides). The reviews were conducted to verify that the licensee's program assured compliance with 10 CFR 61.55 and 10 CFR 61.56, as required by Appendix G of 10 CFR Part 20. The inspectors also reviewed the licensee's waste characterization and classification program to ensure that the waste stream composition data accounted for changing operational parameters and thus remained valid between the sample analysis updates.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Shipping Records

a. Inspection Scope

The inspectors reviewed the documentation for shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness for eight, non-excepted radioactive material and waste shipments during calendar years 2002 through 2004. These shipments included:

- Control Rod Drive Mechanisms to Duratek/GE Nuclear, Memphis, TN (M02-041 and M04-017) - Type A;
- Fuel Channel Coupon Samples to GE-Vallecitos, Sunol, CA (M03-009) - Type A;
- Liner of Spent Resin to ChemNuclear Systems, Barnwell, SC (W02-015) - LSA-II;
- Liner of Spent Resin to Envirocare, Clive, UT (W03-006) - LSA-II;

- SeaLand Container of Contaminated Laundry to Unitech, Morris, IL (M03-022) - LSA-II;
- High Rad DAW Liner to Duratek, Oak Ridge, TN (W03-011) - LSA-II; and
- Recirculation Pump 'B' Impeller to Envirocare, Clive, UT (W04-007) - LSA-II.

The inspectors verified that the requirements of any applicable transport cask Certificate of Compliance or design documentation were met and verified that the receiving licensee was authorized to receive the shipment packages. The inspectors verified that the licensee's procedures for cask loading and closure procedures were consistent with the vendor's approved procedures.

Additionally, the inspectors reviewed shipment packaging, surveying, labeling, marking, placarding, vehicle checks, emergency instructions, disposal manifest, shipping papers provided to the driver, and licensee verification of shipment readiness for following two shipments conducted during the inspection period:

- Liner of Spent Resin and Charcoal to Duratek/Gallaher Road Facility, Kingston, TN (W04-015) - LSA-II; and
- SeaLand Containers of DAW to Duratek, Oak Ridge, TN (W04-017) - LSA-II.

The inspectors observed radiation worker practices during the evolutions to verify that the workers had adequate skills to accomplish each task, to determine if the shippers were knowledgeable of the shipping regulations and whether shipping personnel demonstrate adequate skills to accomplish the package preparation requirements for public transport with respect to NRC Bulletin 79-19 and 49 CFR Part 172 Subpart H. These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors reviewed Corrective Action Program documents, audits and self-assessments that addressed radioactive waste and radioactive materials shipping program deficiencies since the last inspection, to verify that the licensee had effectively implemented the corrective action program and that problems were identified, characterized, prioritized, and corrected. The inspectors also verified that the licensee's self-assessment program was capable of identifying repetitive deficiencies or significant individual deficiencies in problem identification and resolution.

The inspectors also reviewed corrective action reports from the radioactive material and shipping programs since the previous inspection, interviewed staff and reviewed documents to determine if the following activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk:

- Initial problem identification, characterization, and tracking;
- Disposition of operability/reportability issues;
- Evaluation of safety significance/risk and priority for resolution;
- Identification of repetitive problems;
- Identification of contributing causes;
- Identification and implementation of effective corrective actions;
- Resolution of non-cited violations (NCVs) tracked in corrective action system(s); and
- Implementation/consideration of risk significant operational experience feedback.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

4 OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

Cornerstones: Mitigating Systems, Barrier Integrity, and Emergency Preparedness

.1 Reactor Safety Strategic Area

a. Inspection Scope

The inspectors sampled the licensee's submittals for performance indicators (PIs) for the specified period through March 31, 2004. The inspectors used PI definitions and guidance contained in Revision 2 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline" to verify the accuracy of the PI data. The following three PIs were reviewed:

- Reactor Coolant System Leakage,
- Safety System Unavailability - Reactor Core Isolation Cooling System, and
- Safety System Unavailability - High Pressure Core Spray System.

b. Issues and Findings

No findings of significance were identified.

.2 Emergency Preparedness Strategic Area

a. Inspection Scope

The inspectors reviewed the licensee's records associated with the three EP performance indicators (PIs) listed below. The inspectors verified that the licensee accurately reported these indicators in accordance with relevant procedures and

Nuclear Energy Institute guidance endorsed by NRC. Specifically, the inspectors reviewed licensee records associated with PI data reported to the NRC for the period July 2003 through March 2004. Reviewed records included: procedural guidance on assessing opportunities for the three PIs; assessments of PI opportunities during pre-designated Control Room Simulator training sessions, the 2003 biennial exercise, and drills; revisions of the roster of personnel assigned to key ERO positions; and results of periodic ANS operability tests. The following three PIs were reviewed:

- ANS,
- ERO Drill Participation, and
- Drill and Exercise Performance.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Semiannual Trend Review

a. Inspection Scope

The inspectors reviewed various corrective action documents including condition reports, work requests, and common cause analysis evaluations to assess whether there were trends that might indicate the existence of a more significant safety issue. Additionally, the inspectors reviewed various maintenance program reports to identify whether there were repetitive failures that had not been included in the licensee's corrective action process as trends or suggested the existence of a more significant safety issue. These reports included maintenance rework reports dating back to January 2003 and the licensee's corrective and elective maintenance backlog lists. Finally, the inspectors reviewed the licensee's "Unsolved Mystery List," to determine whether the items designated as "unsolved mysteries" were captured in the listed corrective action documents as trends and with the correct prioritization for resolving the issue.

b. Findings

No finding of significance were identified.

.2 Review of Root Cause Report for Trends, Rigor, and Common-Cause Attributes (Annual Sample)

a. Inspection Scope

The inspectors reviewed the root cause report associated with CR 211372. This CR

documents that the air-sparge valve for the standby liquid control (SLC) tank was found out of position; which resulted in the SLC system being declared inoperable at the time of discovery. The inspectors reviewed the root cause report and associated corrective actions to verify that the licensee's identification of the problems was complete, accurate, and timely, and that the consideration of extent of condition review, generic implications, common cause, and previous occurrences was adequate.

b. Issues

No findings of significance were identified; however, the inspectors identified that in some cases the root cause report contained unsubstantiated information, did not identify the underlying root cause, and remained did not address some open questions and issues related to this event. Specifically,

- As stated in Section 4OA3 of this inspection report, the licensee identified that one of the root causes was the failure of the locked valve program to implement the requirements of administrative procedure OP-AA-108-103. When the inspectors requested a copy of the procedure used to implement the CPS locked valve program, the licensee produced CPS 1401.10, "General Equipment Operating Requirements," and stated that Section 8.1.8, "Control of Locked Valves," described the current locked valve program. The inspectors determined that this procedure was superceded by OP-AA-108-103, in August 2001; therefore, the licensee failed to follow the established process (OP-AA-108-103) vice their process failing to implement OP-AA-108-103.

- The root cause report stated that the task manager for this project properly reviewed and discarded paperwork associated with this project. The inspectors determined that the licensee did not interview the task manager during the root cause investigation; therefore, the licensee's conclusions on the task manager's performance was based on assumptions.

- The root cause report documented that during the SLC tank sampling in February 2004, and in March 2004, the chemistry technician, who collected the sample, observed turbulence on the surface of the boron solution; however, he did not report it. The root cause report did not address why the chemistry technician failed to report this issue, since it had not been the practice of chemistry personnel to turn on the sparging system for over a year. When the inspectors questioned the licensee regarding the experience level of the chemistry technician, the licensee indicated that the technician was experienced and had taken several SLC samples in the past. However, the technician had not taken a sample since the new practice had been implemented at Clinton. The inspectors concluded that the change in the licensee processes and desired system conditions for taking the sample had not been properly communicated to the technician during a pre-job brief. By not further investigating why the chemistry technician did not recognize the turbulence as a undesired condition, the root cause report did not include corrective actions to ensure that individuals are properly briefed before performing the job tasks, especially if the task had not been performed for some given time period.

- The licensee root cause report documented that several missed opportunities to identify the mispositioned valve. On February 22, 2004 and March 17, 2004, chemistry personnel used CPS 9915.01, "Chemical Sampling" to verify the concentration of the tank. Step 8.1.13 required operators to close and lock sparge air isolation valve. The licensee determined that this step was marked as "not applicable" (N/A) by the chemistry supervisor before the chemistry technician executed the procedure. The inspectors determined that in 2002, the chemistry department managers made a decision that air sparge mixing was not necessary to obtain a representative sample. In both cases, the licensee did not question the validity of marking the procedure steps as N/A.

The inspectors communicated each of these concerns to the licensee and the licensee agreed that the root cause report needed to be revised to address these observations.

.3 Review of Root Cause Reports for the Control of C1R09 Refueling Outage Collective Dose (Annual Sample)

a. Inspection Scope

During the C1R09 refueling outage (February 2004), the licensee expended 252.245 person-rem collective dose, significantly exceeding the outage estimate/goal of 135 person-rem. The licensee initially identified during the outage that an apparent increase in the plant source term was resulting, at least in part, to the increased collective dose as documented in AR 201183, "C1R09 Source Term." Subsequent to the completion of the C1R09 outage, and concurrent with the root cause evaluation for AR 201183, the licensee initiated an additional root cause evaluation (AR 216449, "Inaccurate C1R09 Man-Hour Estimate Impacts Outage Dose Estimate") to evaluate in full the C1R09 dose overage. Additionally, the RP Department conducted a Focus Area Self-assessment, FASA AT 192086, "Post C1R09 Dose Control/Access Control." The inspectors selected these root cause evaluations and self-assessment (and associated corrective actions) to verify that the licensee's identification of the problems was complete, accurate, and timely, and that the consideration of extent of condition review, generic implications, common cause, and previous occurrences was adequate.

b. Issues

No findings of significance were identified; however, the inspectors identified that less than timely identification of increased dose rates limited the licensee's potential immediate corrective actions; that the licensee's extent of cause evaluation minimally addressed site-wide processes; and that there were multiple, prior opportunities for the licensee to identify and potentially mitigate the issues realized during the C1R09 outage. The C1R09 refueling outage was the first outage since the licensee had implemented Hydrogen Water Chemistry (HWC) and Noble Metals Chemical Addition (NMCA). The licensee's root cause evaluation (RCE) examining the increased source term during the outage (AR 201183), determined that the crud burst could have been anticipated had the station effectively used industry-wide operating experience which showed that a large magnitude crud burst can be expected during the first two to three outages after HWC and NMCA is initiated. The inspectors learned through interviews with licensee

staff that other Boiling Water Reactors (BWRs) in the Exelon fleet (Quad Cities, LaSalle, and Peach Bottom) had specifically observed this phenomena following implementation of HWC and NMCA, but apparently the Clinton staff was not appropriately sensitive to the lessons learned from those stations.

As stated in Section 2OS2.1 of this inspection report, the licensee's recognition of the increased contact dose rates due to the crud burst (in both the upper drywell, and in the reactor water cleanup system in the drywell lower levels) was delayed by a period of approximately 7 days. According to the RCE for AR 201183, RP technicians in the field had an initial perception that dose rates seemed higher, however, they did not realize a change had occurred. Consequently, Outage Control management was not cognizant of the impacts of the crud burst early in C1R09, and as such, could not affect changes in the outage scheduling/management in an attempt to mitigate the dose consequences. The inspectors specifically noted that early in C1R09, the OCC authorized work to commence in the drywell before all the baseline drywell shielding was installed. Additionally, the inspectors determined that the less than timely identification and recognition of the dose rate increases specifically limited the licensee's options with respect to immediate corrective actions.

The root cause report for AR 216449 indicated that the outage dose goal was defined before the full scope of the outage was established, and in the 6 months leading up to C1R09, the outage scope was increased by approximately 20 percent. However, the total dose estimate/goal was not significantly modified and communicated to station management. Additionally, the root cause report for AR 216449 found that one of the root causes for the dose overages was a "lack of a comprehensive and well-understood man-hour/dose estimation process." Through interviews, the inspectors determined that there was no single source for planning time estimates utilized by all workgroups across the station. Rather, data obtained from the system intended to be the primary source was used as inputs to planning tools used by the planning, scheduling and RP groups, but there was no formal feedback mechanisms between the groups to ensure consistent person-hour estimates were used. Though the licensee's root cause report identified this issue as a root cause, the inspectors determined that the licensee's review of the extent of cause was minimally addressed in the report, in that it did not evaluate if any other station processes impacting multiple workgroups had limited formal feedback mechanisms to ensure consistency.

Finally, in evaluating the two root cause reports and the self-assessment overall, the inspectors identified several examples where the licensee failed to evaluate and/or utilize lessons learned (either internal to the station, or external) in planning for and executing the C1R09 refueling outage. Specific examples identified by the inspectors included:

- Exelon fleet experience with crud bursts following implementation of HWC and NMCA;
- No implementation of a baseline dose rate point program to assess radiological conditions throughout the plant early in an outage;
- No single source for planning time estimates utilized by all workgroups across the station;

- Lack of a pre-scheduled Station ALARA Committee meeting within the first 48 hours of an outage to assess any effects of radiological conditions; and
- No consistent strategy utilized for grouping routine outage RWPs.

The inspectors determined that these represented previous opportunities for the licensee to identify and potentially mitigate the issues realized during the C1R09 outage.

4OA3 Event Follow-up (71153)

.1 Standby Liquid Control Air-Sparge Valve Found Opened

a. Inspection Scope

On April 1, 2004, control room operators noted an adverse trend related to SLC storage tank liquid level. The SLC tank liquid level had decreased approximately 350 gallons (4250 gallons to 3900 gallons) since the tank had been filled during refueling outage C1R09. The operators documented this concern in Condition Report (CR) 211372. On April 6, 2004, the licensee identified that the normally locked-closed SLC air-sparge valve was unlocked and in the open position. The inspectors reviewed the licensee's initial response to this event including their assessment of system operability.

b. Findings

Two findings of very low safety significance were identified as described below:

(1) Introduction: Through a self-revealing event (a mispositioned air-sparging valve in the standby liquid control (SLC) storage tank system) the inspectors identified a Non-Cited Violation (NCV) of very low safety significance (Green). This finding resulted from the licensee's failure to implement a corporate locked-valve program which resulted in the SLC system being declared inoperable and the SLC tank contents concentration exceeding TS limits.

Description: The air-sparge valve is designed to provide air to the storage tank sparger to mix the sodium pentaborate (boron) solution. Clinton Power Station (CPS) Procedure 3314.02, "Standby Liquid Control Fill and Chemical Changes," stated that a dedicated operator was required to stand by the SLC tank in the containment, as long as the valve was open, to close the valve if the system was needed to perform its safety-related function. Upon discovery of the mispositiioned valve, the licensee declared both SLC pumps inoperable due to the potential of air binding the pumps. The licensee also concluded that the continuous sparging of the SLC tank induced accelerated evaporation of the tank's contents resulting in the observed decreasing level trend. The valve was closed and the system was declared operable.

The licensee investigated the cause of the event and determined that on February 10, 2004 (during C1R09), Engineering Change (EC) 339004 was completed. This EC was developed to remove the existing boron solution from the SLC storage tank and replace it with a boron solution of higher concentration. A higher concentration of boron solution was necessary to switch from an 18-month to a 24-month fuel cycle.

The licensee's follow-up investigation found that the SLC storage tank air-sparge valve had been left open around February 4, 2004, while refilling the SLC storage tank with the higher concentration boron solution. The refueling outage was completed February 27, 2004.

As part of the filling process, the operators turned on the mixing heater inside the tank and unlocked and opened the air sparging valve to promote mixing. These actions were done in accordance with CPS 3314.02. During the initial fill of the SLC storage tank with the new boron solution, operators overfilled the storage tank due to a tank level indication issue and poor operator practices. Because of this overfilling event, operators had to drain the tank to within TS level requirements. After draining the excess solution, chemistry personnel sampled the SLC storage tank. After the sample was determined to be within limits, the task manager directed the tank lid to be closed and all other required instrumentation to be replaced. Following the completion of these tasks, the modification was declared completed by licensee staff.

The licensee determined that overfilling the tank prevented completion of the work tasks as planned. Specifically, Step 8.2.18 of CPS 3314.02 directed operators to fill the tank to a point not to exceed 4500 gallons (gross) then lock shut the air sparger valve, 1C41-F012. Because of the overfill, this procedure step was never entered. Based on this, the licensee concluded that the procedure was improperly sequenced and thus inadequate. The licensee identified this as one root cause.

The root cause report also documented that the CPS locked valve program was not in compliance with Administrative Procedure OP-AA-108-103, in that, the shift manager was directed to control the locked valve keys and administratively control them so that the status of every locked valve is identifiable from the shift manger's office. The inspectors requested a copy of the procedure used to implement the CPS locked valve program. The licensee supplied the inspectors with a copy of CPS 1401.10, General Equipment Operating Requirements, and stated that Section 8.1.8, Control of Locked Valves, described the current locked valve program. The inspectors performed a history search on this licensee document and identified that CPS 1401.10 had been canceled in May 2001 and was superseded by OP-AA-108-103, August 21, 2001. When questioned regarding this issue, the licensee stated that a fatal flaw analysis comparing the Clinton specific procedure and OP-AA-108-103 was completed in 2001. The fatal flaw analysis concluded that CPS 1401.10 was adequate and there was no need to implement OP-AA-108-103. The inspectors identified and concluded that the licensee failed to follow administrative procedure OP-AA-108-103 since no other program or process of record existed at the time of this event.

Analysis: The inspectors considered the licensee's failure to implement the administrative procedure for locked valve control program and subsequent inadequate procedure for the execution of the SLC storage tank refill, a performance deficiency. The inspectors used IMC 0612, Appendix B, to disposition this issue and determined that it was more than minor because the finding was associated with the Mitigating System attribute of Equipment Performance and affected the Mitigating System objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The SLC systems inject enough

boron solution into the reactor vessel to shutdown the reactor from a full power condition, in case there is a failure of the control rod drives. The SLC storage tank air-sparge valve misalignment created the potential for air binding the pumps used to inject the boron solution. The finding was of very low safety significance because the deficiency, once evaluated, did not result in a loss of function per Generic Letter 91-18 (the pumps would not have been air-bound.) This issue was related to the Human Performance crosscutting area, in that, the failure to implement a procedure resulted in a mispositioned valve which potentially impacted the operability of safety related equipment.

Enforcement: Technical Specifications, Section 5.4, Procedures, states, in part, that written procedures shall be established, implemented, and maintained covering the activities as recommended in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Controlling locked valves is an activity controlled under Regulatory Guide 1.33. In August 2001, by superceding procedure CPS 1401.10 with OP-AA-108-103, "Control of Locked Valves,", the licensee established OP-AA-108-103 as the implementing procedure for locked valve control. Contrary to the above, on August 21, 2001, the licensee failed to implement the requirements of OP-AA-108-103. Consequently, between February 4, and April 6, 2004, the licensee refilled the SLC storage tank and failed to control the position of the SBLC air sparger valve in accordance with the administrative procedure. Specifically, the valve was opened and unlocked and this abnormal lineup was not identifiable (controlled) from the Shift Manager's office. The licensee documented the issues in CR 213560 and generated corrective actions as the result of a root cause report being performed. These corrective action included revising CPS 3314.02 and implementing Administrative Procedure OP-AA-108-103. Because of the very low safety significance of this finding and because the issue was entered into the licensee's corrective action program, the finding is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000461/2004005-03)

(2) Standby Liquid Control Tank Sample Results Outside Technical Specification Acceptability

Introduction: The inspectors identified an NCV for the licensee's failure to perform timely corrective action after discovery that the SLC storage tank air-sparge valve was in the wrong position. This issue resulted in the SLC tank contents (boron concentration) being outside of TS allowed values for greater that the TS allowed outage time.

Description: As stated above, the operators noted a decreasing level trend in the SLC storage tank and on April 6, 2004, at 2.00 p.m., discovered that the SLC storage tank air-sparge valve was open. The licensee attributed the lower liquid level in the SLC storage tank to accelerated evaporation of the water in the boron solution induced by the continuous stream of air being delivered to the tank through the air-sparge valve. The licensee assessed the impact of decreased volume on the acceptability region of TS Figure 3.1.7-1. Apparent cause evaluation (ACE) 213980 documented that following the discovery of the open valve, the licensee determined that the boron solution was still in the "acceptable range" based on the fact that chemistry personnel had seen SLC tank level changes before. The licensee confirmed this decision by performing a comparison between the April 6, 2004, recorded tank volume and the last weight-percent boron

result that was performed (March 17, 2004) and determining where the comparison results fell on TS Figure 3.1.7-1. The basis of this methodology was the assumption that a loss of SLC level would not change the boron concentration.

Updated Safety Analysis Report, Section 9.3.5.2, "System Description" states that the allowable concentration of the sodium pentaborate within the tank is dependent upon the solution volume, per TS Figure 3.1.7.1. The minimum temperature of the fluid in the tank and piping ensures that the sodium pentaborate remains in solution throughout the range of concentrations, as seen in USAR Figure 9.3.7. Based on this information, the inspectors concluded that the boron solution concentration limits ensure that the minimum temperature requirements prevent the precipitation of the sodium pentaborate from the solution. This precipitation could lead to the formation of solid material in the tank and the suction piping of the SLC pumps. This crystallization could impair the SLC pumps' ability to perform their safety-related function.

On April 7, 2004, after further discussions regarding the possible effect of evaporation on the boron solution and comparison between the results of a dilution calculation and TS Figure 3.1.7-1, the licensee decided to restore the SLC tank to its normal level. The licensee decided that it would be prudent to determine the boron solution concentration before adding more water to the tank to restore the normal level. At 3:00 p.m. on April 7, 2004, the sample analysis showed the boron solution concentration was 14.08 percent. This concentration was greater than the maximum value allowed by TS, as depicted in Figure 3.1.7-1 (13.8 percent by weight). The licensee declared both SLC subsystems inoperable and entered TS action statement 3.1.7 action B.1, which is an 8-hour to hot shutdown action statement. The licensee had not performed any manipulation of the SLC storage tank system between the time the air-sparge valve was closed and the tank sample was drawn.

The inspectors determined that the licensee's decision that evaporation of the SLC storage tank boron solution would not affect concentration was incorrect and represented inadequate corrective actions (poor extent of condition review). Based on the as-found concentration and the fact that no manipulations or changes were observed in the SBLC tank between the time the air sparge valve was closed and the sample time, the inspectors identified and concluded that the concentration was outside of TS requirement as depicted in Figure 3.1.7-4 for more than 24 hours.

Analysis: The inspectors considered the licensee decision to not sample the standby liquid control storage tank solution a performance deficiency in that it represented inadequate corrective actions. This decision resulted in the standby liquid control system being outside the TS allowed value after the discovery of the loss of approximately 350 gallons (about 7 percent of the tank contents) boron solution due to accelerated evaporation. The inspectors used IMC 0612, Appendix B, to disposition this issue and determined that it was more than minor because the finding was associated with the Mitigating System attribute of Equipment Performance and affected the Mitigating System objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The SLC system injects enough neutron-absorbing boron solution into the reactor vessel to shutdown the reactor from a full power condition, in case there is a failure of the control

rod drives. The formation of crystallized sodium pentaborate deposits in the SLC storage tank or the SLC pump suction piping could affect the pumps ability of perform their safety-related functions. The licensee determined that -- based on a review of Figure 9.3.7 of USAR, the as-found concentration, and the SLC pump suction pipe temperature log -- the SLC system remained had remained operable. Therefore this finding was of very low safety significance. This finding was related to the Problem Identification and Resolution crosscutting area, in that, the concentration in the tank remained outside limits due to the licensee's failure to identify the impact of evaporation on the solution.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, states, in part, that measures shall be established to assure that conditions adverse to quality, such as nonconformances are promptly identified and corrected. Contrary to the above, on April 6, 2004, the licensee failed to promptly identify and correct a condition adverse to quality. Specifically, the licensee did not sample the contents of the SLC tank and on April 7, 2004, about 24 hours later, determined that the concentration of the SLC tank exceeded the TS limit. Because the tank was undisturbed for this 24 hour period, the inspectors concluded that the licensee exceeded the limiting condition for operation; therefore, failed to identify and correct a condition adverse to quality. Corrective actions related to this issue included training of chemistry and operations personnel on the effects of evaporation on boron solution and requesting chemistry to sample the concentration when there is a unexplained level change. Because of the very low safety significance of this finding and because the issue was entered into the licensee's corrective action program (CR 213980), it is being treated as a Non-Cited Violation consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 05000461/2004005-04)

.3 (Closed) LER 05000461/2003003-01: Reactor Scram Due to Loss of Power to 480 Volt Unit Substation1I

On December 2, 2003, the reactor was manually scrammed from 88 percent power in response to a low feedwater pump suction pressure leading reactor pressure vessel (RPV) water level trending down toward the low-water level - Level 3 automatic scram set point. The initiating event was a loss of power to unit substation 1I causing the 'B" turbine driven reactor feed pump minimum-flow valve to fail open. The cause of the 480 Volt unit substation to trip was a lack of overload protection (i.e., fuse protection) for a branch circuit due to a design error. A second event occurred when an RPV low-water level - Level 3 reactor protection system actuation occurred during the transfer of reactor coolant makeup to the condensate booster pumps. This incident was previously evaluated in Section 1R14 of Inspection Report 05000461/2003009. The LER was reviewed by the inspectors and no additional findings of significance were identified. This LER is closed.

.4 (Closed) LER 05000461/2004001, Generator Neutral Over-Voltage / Lockout Leads to Reactor Scram

On March 22, 2004, an automatic reactor scram occurred with the plant at 93 percent power. The scram was caused by a turbine control valve fast closure after a main turbine trip followed a main generator trip from a generator trip system 2 lockout and

main generator neutral over-voltage trip. All control rods fully inserted and reactor water level dropped to the Low Level-3 trip point as expected for this transient. The operators entered the emergency operating procedures due to the Level-3 trip signal. The root cause for the reactor scram is still under investigation but is expected to be the result of a failed partial discharge analysis system. The inspectors reviewed this LER and CR 210033 with no findings of significance. This LER is closed.

4OA4 Cross-Cutting Aspects of Findings

Human Performance:

.1 The finding described in Section 2OS2.2.b(1) of this report had one of its causes, a human performance deficiency, in that, radiation protection personnel did not adequately evaluate the radiological consequences of a first-time evolution (i.e., the enhanced cool-down process). This resulted in the total collective dose for RWP No. 10002827 to be 11.839 person-rem versus a reasonable re-estimate of 6.043 person-rem.

.2 The finding described in Section 2OS2.2.b(2) of this report had one of its causes, a human performance deficiency, in that, radiation protection personnel did not adequately evaluate the radiological consequences of a first-time evolution (i.e., the enhanced cool-down process). This resulted in the total collective dose for RWP No. 10002830 to be 5.405 person-rem versus an estimate of 1.455 person-rem.

.3 The finding described in Section 4OA3.1.b.(1) of this report had, as one of its causes, a human performance deficiency, in that, the licensee failed to implement the administrative locked valve procedure.

Problem Identification and Resolution:

.4 The finding described in Section 2OS2.2.b(1) of this report had one of its causes, a problem identification and resolution performance deficiency, in that, the licensee did not identify the increased contact dose rates, which resulted in unplanned, unintended occupational collective dose for the work activity in a timely manner. This resulted in the total collective dose for RWP No. 10002827 to be 11.839 person-rem versus a reasonable re-estimate of 6.043 person-rem.

.5 The finding described in Section 2OS2.2.b(2) of this report had one of its causes, a problem identification and resolution performance deficiency, in that, the licensee did not identify the increased contact dose rates, which resulted in unplanned, unintended occupational collective dose for the work activity in a timely manner. This resulted in the total collective dose for RWP No. 10002830 to be 5.405 person-rem versus an estimate of 1.455 person-rem.

.6 The finding described in Section 4OA3.1.b.(1) of this report had, as one of its causes, a problem identification and resolution performance deficiency, in that, the concentration in the SLC tank remained outside limits due to the licensee's failure to identify the impact of evaporation on the solution.

4OA5 Other Activities

.1 TI 2515/156, Offsite Power System Operational Readiness

a. Scope

The inspectors performed an operational readiness review of the offsite power (OPS) systems in response to Temporary Instruction (TI) 2515/156, "Offsite Power System Operational Readiness." Specifically, the inspectors gathered and reviewed licensee data supporting the following requirements:

- Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 17, "Electrical Power Systems," to minimize the likelihood of losing offsite power on loss of the generating unit;
- Appendix B to 10 CFR Part 50, Criterion III, "Design Control" to confirm the design interface between the nuclear power plant (NPP) and the regional transmission operator (RTO);
- Criterion XVI, "Corrective Actions," to confirm the licensee's assessment of the industry operating experience from the August 14, 2003 grid event;
- licensee TS for determining OPERABILITY of the OPS; and
- the licensee's assumptions used in the station blackout analysis performed per 10 CFR 50.63, "Loss of All Alternating Current Power," to determine an acceptable coping time.

The inspectors also reviewed the licensee's requirements for assessing risk when performing work on the OPS or the emergency onsite power systems per 10 CFR 50.65(a)(4).

b. Observations and Findings

No findings of significance were identified. No immediate operability issues were identified during the inspection. In accordance with the TI 2515/156 reporting requirements, the inspectors provided the required data in the work sheets provided with the TI to the headquarters staff for further analysis.

.2 (Closed) Unresolved Item 05000461/2004002-01 Pipe Support Issues Identified on Division 2 SX Piping.

This unresolved item had been left open until the licensee could complete its evaluation of some deficiencies identified on Division 2 essential service water piping supports. The licensee evaluated each of the support issues and determined that the system would have performed its safety function. The licensee concluded that the most likely cause of the deficiencies was inadequate attention to detail during construction, which had not been identified prior to the plant receiving its operating license in April 1987. The inspectors determined that the system would have performed its safety function. No violations of NRC requirements were identified and this item is closed.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. R. Bement and other members of licensee management at the conclusion of the inspection on July 8, 2004. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Interim Exit Meetings

Interim exits were conducted for:

- Emergency preparedness program and performance indicators inspection meeting with Mr. R. Bement on April 23, 2004.

. • Public Radiation Safety radioactive waste processing and transportation programs inspection with Mr. R. Bement on April 30, 2004.

- Maintenance Rule Implementation - Periodic Evaluation with Mr. R. Bement on June 25, 2004.

- Occupational Radiation Safety Post-Outage ALARA and access control inspection with Mr. R. Bement on July 8, 2004.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
R. Bement, Site Vice President
M. McDowell, Plant Manager
B. Bunte, Engineering Programs Manager
W. Carski, Shift Operations Superintendent
R. Croxton, Radiation Protection - Alternate Shipper
J. Cunningham, Work Management Director
R. Davis, Radiation Protection Director
J. DeYoung, Corporate Emergency Preparedness Specialist
J. Domitrovich, Maintenance Director
R. Frantz, Regulatory Assurance Representative
M. Friedman, Emergency Preparedness Manager
R. Grant, Radiation Protection ALARA Supervisor
W. Green, Radiation Protection Corrective Action Program Coordinator
M. Hiter, Access Control Supervisor
J. Icard, Maintenance Rule Coordinator
W. Iliff, Regulatory Assurance Director
J. Madden, Nuclear Oversight Manager
G. Mosley, Program Engineering
L. Oshier, Corporate Emergency Preparedness Specialist
D. Schavey, Operations Director
J. Sears, Chemistry Manager
T. Shortell, Training Manager
A. Snyder, Radwaste Shipper
D. VanAken, Emergency Preparedness Coordinator
C. Williamson, Security Manager
J. Williams, Site Engineering Director

NRC
C. Hinson, Senior ALARA Health Physicist, NRR
A. Stone, Branch Chief, Region III

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000461/2004005-01	FIN	Failure to Maintain Collective Doses ALARA for RWP No. 10002827
05000461/2004005-02	FIN	Failure to Maintain Collective Doses ALARA for RWP No. 10002830
05000461/2004005-03	NCV	Failure to Implement a Locked Valve Procedure

05000461/2004005-04	NCV	SLC Boron Concentration Outside TS Limits for Greater Than Allowed Outage Time

Closed

05000461/2004002-01	URI	Pipe Support Issues Identified on Division 2 SX Piping
05000461/2003003-01	LER	Reactor Scram Due to Loss of Power to 480 Volt Unit Substation1I
05000461/2004001	LER	Generator Neutral Over-Voltage / Lockout Leads to Reactor Scram

Discussed

None

LIST OF DOCUMENTS REVIEWED

The following is a list of documents reviewed during the inspection. Inclusion on this list does not imply that the NRC inspectors reviewed the documents in their entirety but rather that selected sections of portions of the documents were evaluated as part of the overall inspection effort. Inclusion of a document on this list does not imply NRC acceptance of the document or any part of it, unless this is stated in the body of the inspection report.

1R04 Equipment Alignments

AR 00201268 Report; 90800.23 - Fill - Vent Piping Downstream of Injection Valve 1E22-F004.
AR 002265576 Report; NRC Identified Deficiency.
AR 00226575 Report; High Pressure Core Spray Drain Line Funnel Residue.
AR 00201749 Report; Higher Than Expected As-Found Opening Force On MOV 1E22F004.
AR 00226572 Report; 1E22F001 –Grease Observed On Limitorque Assembly.
AR 00200632 Report; Loud Noise During High Pressure Core Spray Pump Start During CPS 9080.23.
AR 00200660 Report; High Pressure Core Spray Injection Manual Isolation Valve Handwheel Freewheeling.
AR 00213723 Report; High Pressure Core Spray Piping Fill and Vent.
AR 00200818 Report; 1E22-F006/7 Loud Noise Following Shutdown of High Pressure Core Spray Pump.
P&ID High Pressure Core Spray (HP) Clinton Power Station, Unit 1, Clinton, Illinois.
Student Handbook, High Pressure Core Spray System, LP85380-02.
Updated Safety Analysis Report (USAR) section 6.3 Emergency Core Cooling System
CPS 3312.01; Residual Heat Removal, Revision 36.
CPS 3312.01V001; Residual Heat Removal Valve Lineup, Revision 15d.
CPS 3312.01E001; Residual Heat Removal Electrical Lineup, Revision 14.
CPS 3312.01V002; Residual Heat Removal Instrument Valve Lineup, Revision 9.
OP-AA-108-103; Locked Equipment Program, Revision 0.
CPS 3001.01V001; Locked Valve Lineup (outside of drywell); Revision 17.
CR 118419; RHR HX 1A SSW Outlet Valve High Unseating Thrust dated August 6, 2002.
CR 118473; 1E12-F068A Fails WO 454283 PMT dated August 7, 2002.
CR 143911; 1SX151A RHR A Pump Room Cooler Relieving Early dated February 10, 2003.
CR 167035; Valve 1E12-F068A Not Indicating Fully Shut dated July 10, 2003.
CR 172676; Residual Heat Removal System Unavailability in Action Region dated August 22, 2003.
CR 198323; RHR A Pump Min Flow Piping Erosion dated January 29, 2004.
CR 231397; Locking Devices on 1E12-F305A & F306A Need Repair dated June 24, 2004.

1R06 Flood Protection

Regulatory Guide 1.102; Flood Protection for Nuclear Power Plants
CPS 4302.01; Tornado/High Winds
CPS 4303.01; Loss of Ultimate Heat Sink
CPS 4303.02; Abnormal Lake Level
CPS 4304.01; Flooding
ER-MW-450 Rev. 1; Structures Monitoring
Maintenance Rule Program - Structural Monitoring Inspection Report, August 1996.
MWH Main Dam Inspection Report for 2002.
MWH Main Dam Inspection Report for 2003.
NSDE Main Dam Inspection Report for 2002.
NSDE Main Dam Inspection Report for 2003.
NSED Inspection Report of Screen house for 2002.
NSED Inspection Report of Screen house for 2003.
Clinton Power Station Updated Safety Analysis Report, Section 2.4.2, Floods.
Clinton Power Station Updated Safety Analysis Report, Section 3.4.1, Flood Protection.
Drawings: M22-1001-00-BC, S22-1004, S22-1023, S03-1045, and S03-1100 through S03-1110.
A/R No. 00142205-06 and 00142205-07.
Work Orders/Work Requests for sump pumps, level switch alarms, water tight doors and seals at the screen house.
Calculations for Local Probable Maximum Precipitation (PMP) for CPS.

1R12 Maintenance Effectiveness (71111.12Q & B)

LP 85273-02; Clinton Power Station Training Manual, Instructor Handbook Area and Process Radiation Monitoring.
Quarterly Ship System Report, March 01, 2004.
System Health Overview Report, March 2004.
Diary of Significant Events, Unplanned LCOs, Troubleshooting activities.
Open AR/PR - WOs, June 8, 2004.
CR Evaluations, June 1, 2004.
AR 00121333 Report, Unplanned LCO entries due to inoperable radiation monitor.
Assignment Report # 01, ACE, October 23, 2002.
Assignment Report # 03, CCA, October 25, 2002.
ER-AA-310; Implementation of the Maintenance Rule; Revision 2
ER-AA-310-003; Maintenance Rule - Performance Selection; Revision 2
ER-AA-310-005; Maintenance Rule - Dispositioning Between (a)(1) and (a)(2); Revision 1
ER-AA-310-1007; Maintenance Rule - Periodic (a)(3) Assessment; Revision 2
FASA # 192092; Clinton Station-Maintenance Rule Program; dated March 26, 2004
Assessment of Maintenance Effectiveness 10 CFR 50.65(a)(3) Assessment (3/1/2002 - 3/1/2004); dated May 27, 2004
Assessment of Maintenance Effectiveness 10 CFR 50.65(a)(3) Assessment (3/1/2000 - 12/1/2001, Augmented to 10/20/2002)
Maintenance Rule Performance Criteria Functions with Child Functions; dated June 14, 2004

Maintenance Rule Reliability Criteria; dated June 14, 2004
Maintenance Rule Availability Criteria; dated June 14, 2004
Maintenance Rule Expert Panel Meeting Minutes; dated January 10, 2002 through May 27, 2004
Maintenance Rule Failure Records for Feedwater, Instrument and Control Power, Switchgear Heat Removal, Reactor Core Isolation Cooling, Low Pressure Core Spray, and Safety Parameter Display System for the Cycle 9 Assessment Period
System Health Overview Reports for Feedwater, Instrument and Control Power, Switchgear Heat Removal, Reactor Core Isolation Cooling, and Low Pressure Core Spray; dated March 2004
(a)(1) Action Plan - Drywell Cooling; dated March 20, 2002 and, April 22, 2004
(a)(1) Action Plan - Feedwater; dated July 15, 2002
(a)(1) Action Plan - Containment Monitoring; dated March 20, 2003
(a)(1) Action Plan - Auxiliary Power; dated November 23, 2003
(a)(1) Action Plan Return to (a)(2) - Leak Detection; dated May 7, 2002
(a)(1) Action Plan Return to (a)(2) - Service Water; dated October 17, 2002
(a)(1) Action Plan Return to (a)(2) - Feedwater; dated March 15, 2004
(a)(1) Action Plan Return to (a)(2) - Neutron Monitoring; dated May 20, 2004
AR00100441; RCIC Outboard Isolation Valve Did Not Stroke Open; dated March 22, 2002
AR00101936; 1FW010C Failed to Open When it Had an Open Signal; dated April 2, 2002
AR00103916; Div 2 NSPS Inverter Transferred to Alt Power; dated April 16, 2002
AR00129655; Div 3 NSPS Inverter 1C71-S001C Supply Fuse Blown; dated October 31, 2002
AR00131871; MRFF for 1VX06CC; dated November 15, 2002
AR00166547; LPCS Min Flow Valve Failed to Operate; dated July 7, 2003
AR00181782; RCIC Min Flow Valve Failure; dated October 19, 2003
AR00183673; RCIC Load Driver Failed; dated October 29, 2003
AR00188206; UPS 1B Inverter Failure; dated November 25, 2003
AR00188854; Operation of MDRFP with Min Flow Vlv Failed Closed; dated December 2, 2003
AR00203354; Actuator for 1B21-F032A Driving Valve in Closed Direction; dated February 23, 2004
AR00204833; Controller C34-R601A Did Not Control of RFP A Speed; dated February 28, 2004
*AR00230892; Enhancement for Maintenance Rule Procedure ER-AA-310; dated June 22, 2004
*AR00230939; Large Deltas Between MR Unavailability Criteria and Actual; dated June 22, 2004
*AR00231281; Maintenance Rule Functional Failure Call Challenged by NRC; dated June 24, 2004
*AR00231563; Untimely Review for Maintenance Rule Functional Failure; dated June 24, 2004
(*Condition Report issued during the inspection)

1R14 Personnel Performance During Non-routine Plant Evolutions

AR 00221737; Control room ventilation 'A' degraded performance.
AR 00219911; Control room ventilation 'A' degraded performance.

1R15 Operability Evaluations

LS-AA-105; Operability Determinations; Without any information to the contrary, once an SSC is established as operable, it is reasonable to assume that the SSC should continue to remain operable, and the previously stated verifications should provide that assurance.
CR 00224155; Torque Switch Trip Out Of Tolerance High, May 27, 2004.

1R19 Post Maintenance Testing

WO# 704735, CPS 9071.01; Diesel Driven Fire Pump Operability test.
Updated Safety Analysis Report (USAR) section 7.2 Reactor Protection (Trip) System and Controls.
WO 00694968 01; 1B21-N678A went from 1027 psig to 1052 psig on May 7, 2004 dated May 7, 2004.
CPS 9030.01; ATM Channel Functional and Calibration Check, Revision 32a.
CPS 9030.01C012; RPS Reactor Pressure B21-N678A Checklist, Revision 26d.
CPS 9431.02; RPS Reactor Pressure B21-N078A Channel Calibration, Revision 38.
CPS 9431.02D001; RPS Reactor Pressure B21-N078A Channel Calibration Data Sheet, Revision 37b.
CPS 9431.19; RPS Reactor Level and Pressure Response Time Test, Revision 35.
CPS 9431.19D001; RPS Level and Pressure Response Time Test Data Sheet, Revision 33.
CPS 8630.02; Analog Trip Module Response Time Test, Revision 36.
CPS 8630.02D001; ATM Response Time Data Sheet, Revision 34.
CPS 8630.32; NSPS Untested Island Analog Trip Module (ATM), Revision 33a.
DWG M05-1071; P&ID Nuclear Boiler (NB) sheet 1, Revision AC.
DWG E02-1RP99; Schematic Diagram Reactor Protection System (RP) Reactor Protection System (NSPS) Clinton Power Station Unit 1, sheets 005A, 013, and 014, Revision J.

1R22 Surveillance Testing

CPS 9054.01, RCIC System Operability Check, Revision 42a.
CPS 9080.01, Diesel Generator 1A Operability - Manual & Quick Start Operability, Revision 49b
CPS 9067.01, Standby Gas Treatment Train Flow/Heater Operability, Revision 30a.
CPS 9053.07, RHR B/C Pump & RHR B/C Water Leg Pump Operability, Revision 45.
WO 00689167 01, 9053.07C21 RHR Pump Operability Test (C-Pump).
CPS 9053.07D001, RHR B/C Pump & RHR B/C Water Leg Pump Operability Data Sheet, Revision 43.
CR 231302, 1E12-F063C Leaks By Seat, dated June 24, 2004.
CR 231174, RHR B/C Water Leg Pump Discharge Pressure High, dated June 24, 2004.

1R23 Temporary Plant Modifications

USAR Section 9.4, Heating, Ventilation, and Air Conditioning.
10 CFR 50.59 Screening No. CL-2004-S-047, PBIs 2004-05-005 and PBI-2004-05-006 have Main Control Room Doors 1DR1-518 and 1DR1-917 remaining open to provide additional positive pressure for the Main Control Room, Revision 0.
CR 219667, VC A Ventilation Train Failed Surv 9070.02, Step 9.1.2.
CR 219911, NRC Inspector Challenged VC Operability Call.
CR 221137, Operability Verification for VC Train B.
CR 221737, Degraded Condition of VC System not evaluated by LS-AA-105.
CR 229134, NRC Resident Questioned Status of VC Train A.
CR 231718, Improvement Opportunity on 50.59 for MCR Doors.

1EP2 Alert and Notification System (ANS) Testing

Siren Operations Manual - DeWitt County; dated February 28, 2003
Clinton Off-Site Siren Test Plan; Revision 1
Clinton Power Station Warning System Maintenance and Operational Report - July 2002
Clinton Power Station Warning System Maintenance and Operational Report - June 2003
Exelon Semi-Annual Siren Report, January 2002 through June 2002
Exelon Semi-Annual Siren Report, July 2002 through December 2002
Exelon Semi-Annual Siren Report, January 2003 through June 2003
Exelon Semi-Annual Siren Report, July 2003 through December 2003
Clinton Power Station Design Study for Elimination of Redundant Sirens and Total Contiguous EPZ Siren Coverage; dated August 2003
EP-AA-125-1004; Emergency Response Facility and Equipment Performance Indicator Guidance; Revision 2
AR 146898; Second Half of 2002 Review of Siren Maintenance Data
AR 206404; First Half of 2003 Review of Siren Maintenance Data
Event Report 39896; Power Loss Longer Than 1Hour to 14 EPZ Sirens Due to Severe Weather; dated May 31, 2003
Letter From Siren System Vendor to Licensee; Siren Outages in DeWitt County Due to Severe Weather; dated June 2, 2003

1EP3 Emergency Response Organization (ERO) Augmentation Testing

EP-AA-112; Emergency Response Organization/Emergency Response Facility Activation and Staffing; Revision 8
EP-AA-112-100; Control Room Operations; Attachment 2; ERO Augmentation; Revision 5
EP-AA-122-1001; Drill Development, Conduct, and Evaluation; Revision 3
Records of Off-Hours, Unannounced Augmentation Drills - July 2002 through March 2004
TQ-AA-113; ERO Training and Qualification; Revisions 3 and 4
EP Training Records of a Random Sample of 50 Station Personnel Assigned to Key or Support ERO Positions
Clinton Station ERO Call-out Roster; dated April 15, 2004

Clinton EP Information Newsletter 04-02; dated March 1, 2004
AR 128735; Some ERO Pagers Did Not Activate for 40 Minutes in October 2002 Drill
AR 169664; Two Pagers Did Not Work in July 2003 Augmentation Drill
AR 173387; One On-Call ERO Member Did Not Respond to Pager in August 2003 Drill
AR 178144; One On-Call ERO Member Was Not Within 50 Minutes of the Station in September 2003 Augmentation Drill
AR 209225; Training Enhancement for Shift Managers on Backup ERO Notification Methods

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

NOA-C-02-02Q; Nuclear Oversight Continuous Assessment Report for Clinton Power Station April 2002 through June 2002
NOA-C-02-3Q; Nuclear Oversight Continuous Assessment Report for Clinton Power Station July 2002 through September 2002
NOA-C-2-4Q; Nuclear Oversight Continuous Assessment Report for Clinton Power Station October 2002 through December 2002
NOSA-PS-3-4; Emergency Preparedness 50.54(t) and Meteorological Program Audit Report for Clinton Station - May 19 through May 23, 2003
NOSA-PS-04-03; Emergency Preparedness 50.54(t) and Meteorological Program Audit Report for Clinton Station; April 5 through 8, 2004
EP Program Health Report, dated April 6, 2004
Assessment 192101; Clinton EP Program Assessment Report - March 2004
Internal Memorandum; Clinton 2002 Off-Year Exercise Findings and Observation Report; dated January 6, 2003
Internal Memorandum; Clinton 2003 Exercise Findings and Observations Report; dated September 3, 2003
Second Quarter 2003 Fleet-Wide Focus Area Self-Assessment on Emergency Plan Public Information Organization Procedures, Operations, Training, and Equipment
Internal Memorandum; Clinton Station 2002 Medical/Health Physics Drill Evaluation Report; dated December 18, 2002
Internal Memorandum; Clinton Station 2003 Medical Drill Findings and Observations Report; dated July 28, 2003
Internal Memorandum; 2002 Emergency Preparedness Assembly and Accountability Drill on November 25, 2002; undated
Internal Memorandum; 2003 Assembly and Accountability Drill Report; dated December 8, 2003
Internal Memorandum; Clinton Station Health Physics Drill on June 16, 2003; dated July 7, 2003
Procedure RP-CL-441-101; Description, Selection, Issuance, and Use of Respiratory Protection Equipment; Revision 2
Revised Letters of Agreement with Off-Site Relocation Centers; dated November 2003
Clinton EP Information Newsletter 03-12; dated January 5, 2004
AR 109820; Suggested Enhancements to Respiratory Protection Program from Nuclear Oversight Audit
AR 138316; Performance Weaknesses in 2002 Off-Year Exercise
AR 138318; Improvement Items in Clinton Station 2002 Off-Year Exercise

AR 138328; Joint Public Information Center Facility and Equipment Concerns in 2002 Off-Year Exercise
AR 138827; 2002 Medical Drill Critique Items
AR 159961; Audit Concerns on Silver Zeolite Cartridge Storage Deficiencies
AR 159962; Audit Concerns on Written Offer to Offsite Officials to Attend Training
AR 160136; Suggested Enhancements to EP Training from Nuclear Oversight Audit
AR 174081; Press Release Concerns and Public Information Staff Performance Concerns in 2003 Exercise
AR 174099; Improvement Items for Emergency Operations Facility Staff and Public Information Organization Performances During 2003 Clinton Station Exercise
AR 174104; Potassium Iodide Issuance Concerns in 2003 Exercise
AR 176100; Enhance Letters of Agreement for Off-Site Relocation Centers
AR185730; Public Address Announcement Not Held in One Onsite Building During 2003 Assembly and Accountability Drill

2PS2 Radioactive Material Processing and Transportation

10 CFR Part 61 Waste Stream Analysis: Dry Active Waste - 7/8/03 Sample; dated July 15, 2003
10 CFR Part 61 Waste Stream Analysis: Phase Separator - 1/22/02 Sample; dated March 26, 2002
10 CFR Part 61 Waste Stream Analysis: Phase Separator - 9/11/03 Sample; dated February 11, 2004
10 CFR Part 61 Waste Stream Analysis: Spent Resin - 6/14/02 Sample; dated June 27, 2002
10 CFR Part 61 Waste Stream Analysis: Spent Resin - 9/15/03 Sample; dated March 3, 2004
10 CFR Part 61 Waste Stream Analysis: Waste Sludge - 6/23/03 Sample; dated July 17, 2003
AR 103399; SRVs Prep for Shipment Not Per Past Practice; dated April 10, 2002
AR 104315; CRDM Package Contamination Concern; dated April 17, 2002
AR 107952; LQ Shipment from CPS to LaSalle Above LQ Limits; dated May 13, 2002
AR 124242; Incorrect Survey Data Used in Shipment Classification; dated September 19, 2002
AR 125762; High Contact Dose Rates Discovered on Waste Sludge Cask; dated October 2, 2002
AR 156860; DAW Shipments Delayed Due to 10 CFR Part 61 Analysis; dated May 1, 2003
AR 162480; Hole Discovered in a 10 Foot Shipping Container; dated June 9, 2003
AR 163970; Teledyne 10 CFR Part 61 Sample Result Discrepancies; dated May 17, 2003
AR 198716; RP-AA-605 and RP-CL-605-1001 Not in Complete Agreement; dated January 30, 2004
AR 210514; C1R09 Lesson - Propane Cylinder Discovered in DAW Drum; dated March 24, 2004
AR 217867; Enhancement to RAM Shipping Records; dated April 30, 2004 [NRC-Identified Issue]

AR 217873; Shipping Record Enhancements; dated April 30, 2004 [NRC-Identified Issue]
Check-In SA AT No. 192113; Check-In Self-Assessment Report: Radioactive Material Processing and Transportation; dated January 31, 2004
Clinton Power Station Annual Radioactive Effluent Release Report, Section 5; dated March 30, 2004
CPS-USAR; Updated Safety Analysis Report, Chapter 11.4, Solid Waste Management System; Revision 10
FO No. 87145-19; NOS Field Observation; dated February 15, 2002
FO No. 100884-10; NOS Field Observation Report; dated April 12, 2002
NO-AA-10; Quality Assurance Topical Report, Appendix E, Control of Radioactive Waste or Materials; Revision 72
Radioactive Material Shipment M02-041; Four CRDM Boxes to GE Memphis (c/o Duratek); dated April 22, 2002
Radioactive Material Shipment M03-009; CHAD Fuel Channel Samples to GE Vallecitos Nuclear Center, Sunol, CA; dated March 12, 2003
Radioactive Material Shipment M03-022; 40' SeaLand Container of Contaminated Protective Clothing to Unitech, Morris, IL; dated May 30, 2003
Radioactive Material Shipment M04-017; Four CRDM Boxes to GE Memphis (c/o Duratek); dated February 12, 2004
Radioactive Waste Shipment W02-015; Dewatered Spent Resin to ChemNuclear Systems, Barnwell, SC in a 21-300 Cask; dated June 27, 2002
Radioactive Waste Shipment W03-006; Dewatered Spent Resin to Envirocare of Utah, Clive, UT in a 21-300 Cask; dated May 9, 2003
Radioactive Waste Shipment W03-011; High Radiation Dry Active Waste Liner to Duratek, Oak Ridge, TN; dated September 10, 2003
Radioactive Waste Shipment W04-007; Reactor Recirculation Pump 'B' Impellar to Envirocare of Utah, Clive, UT; dated March 1, 2004
Radioactive Waste Shipment W04-015; Liner of Spent Resin and Charcoal to Duratek/Gallaher Road Facility, Kingston, TN; dated April 29, 2004
Radioactive Waste Shipment W04-017; SeaLand Containers of DAW to Duratek, Oak Ridge, TN; dated April 28, 2004
Radiological Technical Evaluation 03-022; Analysis of Teledyne and Framatome's 10 CFR Part 61 Results; dated July 22, 2003
RP-AA-602; Packaging of Radioactive Material Shipments; Revision 6
RP-AA-605; 10 CFR Part 61 Program; Revision 0
RP-CL-605-1001; CPS 10 CFR Part 61 Program; Revision 1
RW-AA-100; Process Control Program for Radioactive Wastes; Revision 2
Trending [Data] for Shifts in Scaling Factors (Attachment 5 for RP-CL-605-1001); dated 1st Quarter 2002 through 1st Quarter 2004
SC-01-1524; G.E. Power Systems CRDM Shipping Container - Packaging Certification Document; Revision A, B, and C
SY-AA-101-134; Hazardous Material Transportation Security Plan; Revision 0
SY-AA-101-134-1001; Hazardous Material Transportation Security Plan Risk Assessment; Revision 0

2OS1 Access Control to Radiologically Significant Areas

AR 205527; C1R09 Lesson Potential Radworker Adverse Trend; dated March 2, 2004
AR 206247; Unnecessary Challenges to RP Staff Personnel; dated March 4, 2004
AR 207680; C1R09 Lesson - Radworker Issue Reports; dated March 11, 2004
AR 221321; Radworker Entered Contamination Area Without Proper Dress; dated May 14, 2004
AR 222129; Whole Body Count Not Performed IAW RP-AA-220; dated May 19, 2004
RP-AA-220; Bioassay Program; Revision 1
RP-AA-220; Attachment 2, Intake Investigation Forms (for two workers on RWP No. 10002865, and one worker on RWP No. 10002824); dated February 16 and 22, 2004
RP-AA-201; Radiological Air Sampling Program; Revision 0
RP-AA-460; Controls for High and Very High Radiation Areas; Revision 4
RP-CL-301-101; Attachment 2, Manual DAC-Hr Calculation Sheet (for workers on February 19 - 21, 2004); dated May 17, 2004
RP-CL-301-101; Attachment 3, Air Sample Index Log; dated February 21 - 22, 2004
RP-CL-460-101; Radiological Key Control and Area Access Requirements; Revision 2

2OS2 As Low As Is Reasonably Achievable (ALARA) Planning And Controls

ALARA Post-Job Review for RWP No. 10002826; dated May 27, 2004
ALARA Post-Job Review for RWP No. 10002827; dated March 29, 2004
ALARA Post-Job Review for RWP No. 10002828; dated April 16, 2004
ALARA Post-Job Review for RWP No. 10002830; dated April 16, 2004
ALARA Post-Job Review for RWP No. 10002832; dated June 4, 2004
ALARA Post-Job Review for RWP No. 10002839; dated June 1, 2004
ALARA Post-Job Review for RWP No. 10002841; dated May 27, 2004
ALARA Post-Job Review for RWP No. 10002842; dated March 17, 2004
ALARA Post-Job Review for RWP No. 10002843; dated June 4, 2004
ALARA Post-Job Review for RWP No. 10002851; dated April 23, 2004
ALARA Post-Job Review for RWP No. 10002852; dated April 29, 2004
ALARA Post-Job Review for RWP No. 10002854; dated March 18, 2004
ALARA Post-Job Review for RWP No. 10002861; dated June 1, 2004
ALARA Post-Job Review for RWP No. 10002865; dated June 1, 2004
ALARA Post-Job Review for RWP No. 10002866; dated June 4, 2004
ALARA Post-Job Review for RWP No. 10002867; dated June 3, 2004
AR 199980; C1R09 Lesson DW ALARA, Shielding Placement and Work Schedule; dated February 6, 2004
AR 200233; C1R09 Lesson - Insulation Removal/Lead Shielding Work Logic; dated February 7, 2004
AR 200925; C1R09 Lesson Workers Not Using Information Pkgs Provided; dated February 11, 2004
AR/RCE 201183; C1R09 Source Term; dated June 3, 2004
AR 203039; C1R09 Lesson Insulation Re-Installed Prior to Pressure Test; dated February 20, 2004
AR/RCE 216449; Inaccurate C1R09 Man-Hour Estimate Impacts Outage Dose Estimate; dated May 26, 2004
CPS 3007.01; Preparation and Recovery from Refueling Operations; Revision 13e

CY-AA-160-100; Reactor Water (RR) Sampling Data Sheets; dated January 31 - February 6, 2004
CY-AB-120-130; BWR Shutdown Chemistry; Revision 2
FASA AT 192086; Focus Area Self-assessment Report: Post C1R09 Dose Control/Access Control; dated April 14, 2004
RP-AA-400; ALARA Program; Revision 3
RP-AA-401; Operational ALARA Planning and Controls; Revision 3
RWP/ALARA Plan No. 10002826; RR 'B' Recirculation Pump and Motor Replacement; dated January 28, 2004
RWP/ALARA Plan No. 10002827; C1R09 SRV Replacement; dated January 28, 2004
RWP/ALARA Plan No. 10002828; Replace 21 Control Rod Drive Mechanisms (CRDM); dated January 5, 2004
RWP/ALARA Plan No. 10002830; Drywell Feedwater/Main Steam System Work; dated January 29, 2004
RWP/ALARA Plan No. 10002832; C1R09 Drywell Insulation; dated January 21, 2004
RWP/ALARA Plan No. 10002839; Drywell LPRM Removal/Replacement; dated January 29, 2004
RWP/ALARA Plan No. 10002841; C1R09 Reactor Water Cleanup System Work; dated January 24, 2004
RWP/ALARA Plan No. 10002842; Drywell Scaffold for C1R09; dated January 28, 2004
RWP/ALARA Plan No. 10002851; C1R09 ISI/FAC Inspections; dated January 28, 2004
RWP/ALARA Plan No. 10002852; C1R09 LLRT; dated January 28, 2004
RWP/ALARA Plan No. 10002854; ECCS/CT RHR System Work, Including RHR 'A' Heat Exchanger Work; dated January 28, 2004
RWP/ALARA Plan No. 10002843; C1R09 Drywell Shielding; dated January 28, 2004
RWP/ALARA Plan No. 10002861; Drywell Undervessel Preps and Restore; dated January 28, 2004
RWP/ALARA Plan No. 10002865; Reactor Disassembly and Reassembly Work in the Reactor Cavity; dated January 28, 2004
RWP/ALARA Plan No. 10002866; Reactor Disassembly and Reassembly - Work Outside Cavity; dated January 28, 2004
RWP/ALARA Plan No. 10002867; Complete Fuel Transfers, Core Alterations, IVVI, and Core Verifications during C1R09; dated January 29, 2004
Survey Index No. 04-02-03-16; Radiological Survey, Drywell 768' El. G/A; dated February 3, 2004
Survey Index No. 04-02-03-17; Radiological Survey, Drywell 723' El. - Initial Survey; dated February 3, 2004
Survey Index No. 04-02-06-06; Radiological Survey, Drywell 723' El. - Post Shield Survey; dated February 6, 2004
Survey Index No. 04-02-07-62; Radiological Survey, Drywell 768' El. G/A - Pre-Shielding for SRV Work; dated February 7, 2004
Survey Index No. 04-02-14-27; Radiological Survey, Drywell 768' El. G/A - Post-Shielding; dated February 14, 2004
Temporary Shielding Permit 2004-003; SRV Shielding Package; dated February 8, 2004
Temporary Shielding Permit 2004-003; G33 (RWCU Valves) Shielding; dated February 10, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002826; dated February 13 - 20, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002827; dated February 7 - 11, 2004

Work-In-Progress Reviews Nos. 1 - 2 for RWP 10002828; dated February 8 - 9, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002830; dated February 10 - 17, 2004
Work-In-Progress Review No. 1 for RWP 10002832; dated February 16, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002839; dated February 3 - 17, 2004
Work-In-Progress Reviews No. 1 - 3 for RWP 10002841; dated February 10 - 13, 2004
Work-In-Progress Review No. 1 for RWP 10002842; dated February 13, 2004
Work-In-Progress Reviews Nos. 1 - 2 for RWP 10002843; dated February 9 - 13, 2004
Work-In-Progress Reviews Nos. 1 - 2 for RWP 10002851; dated February 14 - 16, 2004
Work-In-Progress Reviews Nos. 1 - 2 for RWP 10002852; dated February 9 - 10, 2004
Work-In-Progress Reviews Nos. 1 - 5 for RWP 10002854; dated February 8 - 17, 2004
Work-In-Progress Reviews Nos. 1 - 2 for RWP 10002865; dated February 4 - 20, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002861; dated February 10 - 16, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002866; dated February 9 - 16, 2004
Work-In-Progress Reviews Nos. 1 - 3 for RWP 10002867; dated February 11 -18, 2004

4OA1 Performance Indicator (PI) Verification

EP-AA-125-1001; EP Performance Indicator Guidance; Revision 2
EP-AA-125-1002; ERO Performance - Performance Indicators Guidance; Revision 2
EP-AA-125-1003; ERO Readiness - Performance Indicators Guidance; Revision 2
Clinton Station EPZ Sirens Daily and Monthly Operability Reports - July 2003 through March 2004
LS-AA-2110; Monthly PI Data Elements for ERO Drill Participation - July 2003 through March 2004; Revisions 5 and 6
LS-AA-2120; Monthly PI Data Elements for Drill/Exercise Performance - July 2003 through March 2004; Revisions 3 and 4
LS-AA-2130; Monthly Data Elements for ANS Reliability - July 2003 through March 2004; Revisions 3 and 4
AR 179966; An Untimely Emergency Notification During an October 2003 Drill
AR 189357; Failed PI Opportunity During November 2003 Drill - Notification Form Error

Event Follow-Up

Work Order 00489967 Rev. 01; Install EC 339004 - SLC Boron Concentration Upgrade.
Apparent Cause Evaluation, CR 213980; SLC Tank Sample Results Outside Technical Specification Acceptability Range.
Root Cause Report Content, 213560; Standby Liquid Control air sparge valve was left open following tank refill, causing the system to be inoperable and unavailable from the unit startup in February, 2004 following C1R09 until it was identified and closed in April, 2004.
CPS 3007.01; Preparation and Recovery From Refueling Operations.
CPS 3314.01; Standby Liquid Control (SC).
CY-AA-130-200, Revision 4; Quality Control.
CPS 64.03.03; Boron Determination By Titrator.
CPS 9915.01; Standby Liquid Control Chemical Sampling.
CPS 3001.01V001; Locked Valve Lineup (Outside of Drywell).

4OA2 Identification and Resolution of Problems

AR 00111110; On-line performance Indicators shown abnormal trend post C1R08.
AR 00111839; Molded case breakers did not meet testing criteria.
AR 00117832; MOV periodic Verification test on 1FC007 is past due.
AR 00117964; Declining performance in Operations Department in 2nd Qtr.
AR 00126390; Failure to perform OP-CL-101-401-1001.
AR 00127708; SYSMON indicates adverse trend in Division 1 DC system.
AR00128394; Potential Adverse Trend for Engineering Work Activities.
AR 00130297; MOV Periodic Verification Tests Past Due.
AR 00140223; Trend Identified in Operations Human Performance (CCA).
AR 00144628; Adverse Trend CCA on Sec Access Authoriz/Access Control Procedure.
AR 00149851; REMP Air Sampling Equipment Malfunction.
AR 00150279; Improper Storage of Materials Inside Flammable Cabinets.
AR 00154418; NOS ID's Adverse Trend on Initiation of Condition Reports.
AR 00161834; Lube Oil Trending Program Weaknesses.
AR 00158933; Instrument Trend CR for Div 3 DG K54x Time Delay Relay.
AR 00174331; ERAT SVC Room - Air Conditioning System.
AR 00176332; Enhancement CR Documenting RP 2nd Quarter Scorecard Results.
AR 00176776; Fire Pump Block Heaters Repeat Failures.
AR 00176873; RR 'B' Pump Lower Seal Temp up 18 F Since Cycle-9 start.
AR 00180006; Div. 3 DG Fuel Oil Pressure Gauges.
AR 00181082; Corrosion Found on Cell 24 Positive Cell Post for Div III.
AR 00182343; Declining Trend in the Industrial Safety Program.
AR 00189110; RCIS INOP, Rod Block and Unexpected ORM entry.
AR 00189234; RC&IS Lockup During Rod Motion.
AR 00189755; Trending CR for Fire Pumps 0FP01PA/0FP01PB.
AR 00192243; Trend of Hydramotor Failures in 2003.
AR 00194276; Adverse trend on HPCS pump DP during 9051.01
AR 00197942; Install Temporary gauge for HPCS Surveillance 9051.01.
AR 00208355; Adverse trend in inboard A MSIV leakage.
AR 00208357; Adverse trend in outboard A MSIV leakage.
AR 00208379; Adverse trend in inboard MS drain isolation 1B21-F016 LLRT.
AR 00208383; Adverse trend in outboard MS drain isolation 1B21-F019 LLRT.
AR 00208386; Adverse trend in outboard RCIC steam supply 1E51-F064 LLRT.
AR 00208414; Adverse trend in RHR C injection MOV 1E12-F042C LLRT.
AR 00213163; Sysmon indicates adverse trend in Division 2 DC system.
AR 00219529; 3B heater potential tube leak from level controller trend.
AR 00223647; Adverse trend in configuration control events.
WO 1126; RCIC turbine trip valve doesn't indicate tripped.
WO 10595; RCIC turbine speed GETARS card 1C88N2403 will not calibrate.
WO 11966; Point 9 RCIC instrument panel area temp at alarm setpoint.
WO 25465; Pefrom non-intrusive check valve diagnostic testing.
WO 30177; System Engineer identified that protective jacket for conduit.
WO 410528; Low fails are coming in at least once per shift.
WO 439707; Replace MCC Bucket with new one, EC#330624, CR/CDE-79346.
WO 439706; Replace MCC Bucket with new one, EC#330624, CR/CDE-79346.
WO 40499; Replace MCC Bucket with new one, EC#330624, CR/CDE-79346.

WO 40500; Replace MCC Bucket with new one, EC#330624, CR/CDE-79346.
WO 41759; RCIC STM Outboard won't open with C/S.
WO 43481; Lost indication and status light during RCIC trip.
WO 47553; 1E51-F064 will not open.
WO 438188; 1E51F064 found to have 60 DPM packing leak during RPV Hydro.
WO 49217; LC valve stem leakage.
WO 50289; Install new packing & rework valve due to repeated steam.
WO 50768; Trouble shoot/determine cause for repeat issue - CR-100604.
WO 54864; Failed source check during 9038.70.
WO 48140; Getars flow ch.20 not responding during RCIC run CR-116075.
WO 457087; RCIC storage tank level switch reset light is erratic.
WO 65962; During RCIC outage insulation was removed from the RCIC.
AR 00219990; Need calibration for pressure indication.
AR 00220003; Need calibration of instruments in C1R10.
AR 00220007; Need calibration of pressure indication.
AR 00220723; Local speed indicator failed low, should be 2700 RPM.
AR 00220968; Broken studs on the 3B FW heater partition plates.
AR 00220969; Trouble RFPT 1B pump/turb annunciator 5002-1F came in.
AR 221292; Failed PMT on 'A' level switch during 3813.01.
AR 00221527; FCV "B" failed to open past 15% during power ascension.
AR 00221559; Configuration control event associated with 1PA05J.

4OA5 Other Activities

ACE 00199270; Observations in Screen House Tunnel; dated April 23, 2004

LIST OF ACRONYMS USED

ACE	Apparent Cause Evaluation
ADAMS	Agency wide Documents Access and Management System
ALARA	As Low As Is Reasonably Achievable
ANS	Alert and Notification System
AR	Assignment Report
BWR	Boiling Water Reactor
C1R09	Clinton Power Station's 9th Refueling Outage
CFR	Code of Federal Regulations
CPS	Clinton Power Station
CRs	Condition Reports
DAW	Dry Active Waste
EC	Engineering Change
EDG	Emergency Diesel Generator
EED	Exelon Energy Delivery
EP	Emergency Preparedness
ERO	Emergency Response Organization
EPZ	Emergency Planning Zone
GDC	General Design Criterion
HPCS	High Pressure Core Spray
HRA	High Radiation Area
HWC	Hydrogen Water Chemistry
IMC	Inspection Manual Chapter
LCO	Limiting Conditions for Operation
LOOP	Loss of Offsite Power
MAIN	Mid-America Interconnected Network
MR	Maintenance Rule
NCV	Non-Cited Violation
NDO	Nuclear Duty Officer
NMCA	Noble Metal Chemical Addition
NPP	Nuclear Power Plant
NRC	Nuclear Regulatory Commission
OA	Other Activities
OCC	Outage Control Center
OPS	Offsite Power Systems
ORM	Operational Requirements Manual
OSC	Operations Support Center
PARS	Publicly Available Records
PI	Performance Indicator
Radwaste	Radioactive Waste
RCE	Root Cause Evaluation
RHR	Residual Heat Removal
RP	Radiation Protection
RT	Reactor Water Cleanup
RTO	Regional Transmission Operator
RWP	Radiation Work Permit
SBO	Station Blackout

SDP	Significant Determination Process
SLC	Standby Liquid Control
SRO	Senior Reactor Operator
TI	Temporary Instruction
SSC	Structures, Systems, and Components
TS	Technical Specifications
USAR	Updated Safety Analysis Report
VHRA	Very High Radiation Area
WIP	Work In Progress
WOs	Work Orders