November 2, 2006

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 05000461/2006007

Dear Mr. Crane:

On September 30, 2006, the U.S. Nuclear Regulatory Commission (NRC) completed an integrated inspection at your Clinton Power Station. The enclosed report documents the inspection results, which were discussed on October 12, 2006, with Mr. B. Hanson 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, one self-revealing finding of very low safety significance (Green), which involved a violation of NRC requirements, was identified. However, because the finding was of very low safety significance and because the violation was entered into your corrective action program, the NRC is treating this issue as a Non-Cited Violation (NCV) 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, D.C. 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, U.S. Nuclear Regulatory Commission, Washington, D.C. 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, and your response (if any) 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/

Mark A. Ring, Chief
Branch 1
Division of Reactor Projects

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

Enclosure:
Inspection Report No. 05000461/2006007
w/Attachments:
1. Supplemental Information
2. Split Sample Report
3. Tritium Sample Results

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
Manager Licensing - Clinton Power Station
Senior Counsel, Nuclear, Mid-West Regional Operating Group
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
State Liaison Officer, State of Illinois
Chairman, Illinois Commerce Commission

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Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Manager Licensing - Clinton Power Station
Senior Counsel, Nuclear, Mid-West Regional Operating Group
Document Control Desk - Licensing
Assistant Attorney General
Illinois Emergency Management Agency
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	05000461/2006007
Licensee:	AmerGen Energy Company, LLC
Facility:	Clinton Power Station
Location:	Clinton, IL 61727
Dates:	July 1 through September 30, 2006
Inspectors:	B. C. Dickson, Senior Resident Inspector D. Tharp, Resident Inspector A. Barker, Project Engineer D. Melendez-Colon, Reactor Engineer T. Ploski, Senior Emergency Preparedness Analyst W. Slawinski, Senior Radiation Specialist S. Orth, Health Physics Program Manager W. Snell, Senior Health Physicist E. Bonano, Health Physicist
Approved by:	M. Ring, Chief Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000461/2006007, AmerGen Energy Company LLC, 07/01/2006-09/30/2006; Clinton Power Station; Event Follow-up.

This report covers a 3-month period of baseline resident inspection and announced baseline inspections of radiation protection and emergency preparedness. The inspection was conducted by Region III inspectors and the resident inspectors. One Green finding with an associated Non-Cited Violation (NCV) was 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 safe 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: Initiating Events

- Green. A finding of very low safety significance and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI, was self-revealed following a reactor scram on August 27, 2006, due to the licensee's failure to identify and correct a condition adverse to quality (failed circuit board) in March 2006. As a corrective action, the licensee determined and corrected the actual cause of the failure and revised procurement procedures to disallow purchase of parts manufactured under the same process as the failed board. Additionally, the licensee commenced a common cause evaluation to address proficiency in identifying the causes of operational occurrences.

  The finding was more than minor because it resulted in a reactor scram and was associated with the equipment performance attribute of the initiating events cornerstone. The finding was of very low safety significance because it would not affect the availability of a mitigating system. The finding was also determined to affect the cross-cutting area of problem identification and resolution in that the actual cause of the March 26, 2006, failure was not properly identified, resulting in the resolution not addressing the cause. (Section 4OA3)

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

The plant entered the inspection period operating at approximately 97 percent rated thermal power. On July 17, operators lowered power to 93 percent to support the reactive loading on the grid, and stayed at this reduced power level for about 7 hours, before returning to 97 percent power. Similar power reductions and subsequent restorations were performed on July 25, July 27, July 28, July 31, and August 1, 2006. On August 6, 2006, operators lowered power to approximately 80 percent to replace number 1 and 2 combined intermediate valve servo strainers, and then returned the unit to 97 percent power. On August 15, 2006, reactor power was reduced to 64 percent and the A turbine driven feed pump was removed from service to repair a steam leak on the 1CB009A valve. Operators returned the plant to 97 percent power on August 16, following repairs and post maintenance testing. Clinton experienced an automatic reactor scram on August 27, 2006, when the Division 4 nuclear safety power supply inverter failed, resulting in the automatic actuation of the high pressure core spray system including injection into the core. During the high pressure core spray injection, the A reactor recirculation pump tripped, and the resulting swell caused reactor vessel water level to exceed the high level scram setpoint. Operators commenced reactor startup on August 29, 2006, and restored the plant to 96 percent power on August 31, 2006. On September 2, 2006, power was reduced to 80 percent for a control rod pattern adjustment, and then returned to approximately 96 percent. On September 18, the transmission system operator requested that Clinton Power Station reduce power by 50 megawatts electric as a contingency action to prevent overloading the Rising (off-site power) line, in the event that the Brokaw line tripped, while the Latham line was out of service. Plant operators complied with this request, and lowered reactor power to 92 percent. Later on August 18, operators restored reactor power to 96 percent. On August 19, 2006, operators lowered power again, this time to 94 percent, as part of the contingency plan for the Latham line maintenance, and remained there until the contingency was lifted on August 21, 2006. Plant operators then restored power to 96 percent and remained there through the close of the inspection period.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather (71111.01)

a. Inspection Scope

The inspectors verified that the licensee had completed its seasonal preparations for Summer in a timely manner before the hot weather actually presented a challenge. The inspectors reviewed licensee preparations for summer readiness in accordance with station procedures and evaluated implementation of these procedures for risk-significant systems that need to be protected during extreme hot weather conditions. The inspectors selected the condensate, instrument air, auxiliary power, and turbine building ventilation systems for detailed review. The inspectors reviewed the system managers' seasonal review checklists, work orders, and issue reports related to the systems' preparation for the summer readiness period. The inspectors verified that the licensee's annual summer readiness procedure adequately covered risk-significant equipment and

ensured that the equipment was in a condition to meet the requirements of Technical Specifications (TSs), the Operations Requirements Manual (ORM), and the 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 issue reports.

In addition, the inspectors reviewed licensee actions in response to extreme heat on July 31 and August 1 by validating actions in accordance with station procedures for high temperatures and summer operations. The inspectors reviewed the plant discharge second drop structure temperature ORM requirements and the licensee's preparations for derate if necessary.

The activities represented two inspection samples. A list of documents reviewed during these evaluations is included at the end of this report.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04)

a. Inspection Scope

The inspectors performed partial walkdowns of accessible portions of divisions of risk-significant mitigating systems equipment during times when the divisions were of increased importance due to the redundant divisions 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 issue reports associated with the divisions to verify that those documents did not reveal issues that could affect division 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 two samples by verifying the alignment of the following divisions:

- Residual heat removal "B", and
- Division 1 diesel generator.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

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 on 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 cause a plant transient, or their impact on the licensee'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 not obstructed, 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 reviewed portions of the licensee's fire protection evaluation report and the USAR to verify consistency in the documented analysis with installed fire protection equipment at the station.

The inspectors completed four samples by inspection of the following areas:

- Fire Area C-2, Elevations 828' 3", 778' 0", and 803'3" Containment,
- Fire Area D-2, Division 1 diesel generator fuel oil storage tank, and Fire Zones D-5a and D-5b, Division 1 diesel generator room and fuel oil day tank room,
- Fire Zones M-2a, Division 3 shutdown service water pump room and M-2b, Division 2 shutdown service pump room, and
- Fire Zones T-1f, 737'-0" general access area and T-1h, 762'-0" and 785'-0" general access and equipment.

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 reviewed USAR Section 3.4.1 for external flooding events and reviewed the licensee's flooding procedures and issue reports related to possible flood protection issues. A list of the documents reviewed is included at the end of this report. The inspectors completed one inspection sample by completing the annual external flooding review.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

The inspectors reviewed the results of performance testing on the high pressure core spray pump room coolers (1VY08SA and 1VY08SB) and associated calculations, to determine if there was acceptable heat exchanger performance per generic letter 89-13, “Service water system problems affecting safety-related equipment.” In addition, the inspectors verified that the test was performed in accordance with the licensee’s maintenance program for heat exchangers. The inspectors also reviewed documentation to verify that acceptance criteria were consistent with design basis values, as outlined in the USAR. The inspectors performed a walkdown of the system to verify the physical integrity of the equipment.

This inspection represented the completion of one annual heat sink inspection sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program (71111.11)

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 area 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:

- SE-LOR-70, “Anticipated transient without scram without main condenser,”
- 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 evaluations 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 (71111.12)

a. Inspection Scope

The inspectors reviewed the effectiveness of the licensee's maintenance efforts in implementing 10 CFR 50.65 (the maintenance rule (MR)) requirements, including a review of scoping, goal-setting, performance monitoring, short and long-term corrective actions, and current equipment performance problems. These systems were selected based on their designation as risk-significant under the maintenance rule, or being in the increased monitoring (MR category (a) (1)) group. In addition, the inspectors interviewed the system engineers and maintenance rule coordinator. The inspectors also reviewed condition reports and associated documents for appropriate identification of problems, entry into the corrective action system, and appropriateness of planned or completed actions. The documents reviewed are listed at the end of the report. The inspectors completed two samples by reviewing the following:

- Feedwater system, and
- Residual heat removal system Division 2.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessment (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 completed five samples by assessing the effectiveness of risk management activities for the following work activities or work weeks:

- Division 2 work activities including Division 2 diesel generator air compressor and dryer skid maintenance in coincidence with multiple radiography activities in the B residual heat removal pump room and the B standby gas treatment room,
- Work week 632, high pressure core spray valve operability and pump surveillance operator actions in the field to credit availability,
- Work week 633, reactor core isolation cooling system valve operability and spent fuel pool cooling 004B valve local leak rate testing and maintenance,

- Division 3 shutdown service water flow balance testing, and
- Work week 636, reactor core isolation cooling quick start surveillance in coincidence with Division 4 card select decoder calibration.

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 one sample by reviewing the licensee's complex troubleshooting plan and results following the automatic isolation of the reactor core isolation system during the reactor scram response on August 27, 2006.

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 TSs and USAR, as well as the documents listed at the end of this report, to evaluate this area.

Testing subsequent to the following activities was observed and evaluated to complete seven inspection samples:

- Division 1 diesel generator replacement of three Kiene valves,
- Battery room exhaust fan isolation damper, 1VX59YA hydramotor stroking,
- Reactor core isolation cooling failed ramp generator card replacement,
- Residual heat removal "C" pump seal cooler cleaning and inspection,
- Residual heat removal "C" 1VY07S flow control valve stroking,
- Turbine driven fire pump "A" annual maintenance, and
- Spent fuel pool containment isolation valve maintenance and local leak rate testing.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors evaluated the licensee's conduct of outage activities to assess the licensee's control of plant configuration and management of shutdown risk during the forced outage following the reactor scram on August 27, 2006. The inspectors reviewed configuration management to verify that the licensee maintained defense-in-depth and reviewed major outage work activities to ensure that correct system lineups were maintained for key mitigating systems. The inspectors completed one sample by evaluating the licensee's troubleshooting activities around:

- Division 4 nuclear safety power supply inverter failure,
- High pressure core spray system auto initiation and injection,
- Reactor recirculation pump A trip, and
- Reactor core isolation cooling automatic system isolation.

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 evaluated the following four surveillance tests, each surveillance is considered a single inspection sample:

- CPS 9431.61, Average power range monitor flow gain adjustments,
- CPS 9080.02, Division 2 diesel generator monthly operability run and air receiver test,

- CPS 9170.02, Control room ventilation valve strokes and 10 hour operability run, and
- CPS 8801.02, Residual heat removal flow element loop calibration.

The inspectors also evaluated the following in-service testing surveillance activity for one additional inspection sample:

- CPS 9054.01C002, Reactor core isolation cooling high pressure operability checks.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System (ANS) Testing (71114.02)

a. Inspection Scope

The inspectors discussed with Emergency Preparedness (EP) staff the design, equipment, and periodic testing of the public ANS for the Clinton reactor facility emergency planning zone to verify that the system was properly tested and maintained. The inspectors also reviewed procedures and records for a 6-month period ending June 2002, related to ANS testing, annual preventive maintenance, and non-scheduled maintenance. The inspectors reviewed the licensee's criteria for determining whether each model of siren installed in the emergency planning zone would perform as expected if fully activated. Records used to document and trend component failures for each model of installed siren were also reviewed to ensure that corrective actions were taken for test failures or system anomalies. These activities constituted a single inspection sample.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation Testing (71114.03)

a. Inspection Scope

The inspectors reviewed the licensee's ERO augmentation testing to verify that the licensee maintained and tested its ability to staff the ERO during an emergency in a timely manner. These activities constituted a single inspection sample.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level and Emergency Plan Changes (71114.04)

a. Inspection Scope

The inspectors completed a screening review of Revision 8 of the Clinton Power Station Annex to the Exelon Standardized Emergency Plan to determine whether changes identified in this revision may have reduced the effectiveness of the licensee's emergency planning, and to verify that emergency action level and definitions changes associated with NRC Bulletin 2005-02 were adequately incorporated in this revision. The screening review of Revision 8 does not constitute approval of the changes and, as such, the changes are subject to future NRC inspection to ensure that the emergency plan continues to meet NRC regulations.

These activities completed one inspection sample.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control to Radiologically Significant Areas (71121.01)

.1 Review of Licensee Performance Indicators for the Occupational Exposure Cornerstone

a. Inspection Scope

The inspectors reviewed licensee event reports, corrective action documents, electronic dosimetry transaction data for radiologically controlled area egress, internal dose assessment summary information, and data reported on the NRC's web site relative to the licensee's occupational exposure control performance indicator to determine whether or not the conditions surrounding any actual or potential performance indicator (PI) occurrences had been evaluated, and identified problems had been entered into the corrective action program for resolution.

This review represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns/Boundary Verifications and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors identified work performed within high and locked high radiation areas of the plant and other potentially exposure significant work activities and selectively reviewed radiation work permit (RWP) packages and radiation surveys for these areas. The inspectors evaluated the radiological controls to determine if these controls including postings and access control barriers were adequate.

The inspectors reviewed active RWPs which governed activities in radiologically significant areas to identify the work control instructions and control barriers that had been specified. For these activities, electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant procedures.

The inspectors walked down and surveyed numerous high and locked high radiation area boundaries in the Turbine, Radwaste, Auxiliary and Containment Buildings to determine if the prescribed radiological access controls were in place, that licensee postings were complete and accurate, and that physical barricades/barriers were adequate. During the walkdowns, the inspectors challenged access control boundaries to determine if high radiation area (HRA) and locked high radiation area (LHRA) access was controlled in compliance with the licensee's procedures, TSs, the requirements of 10 CFR 20.1601, and were consistent with Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas in Nuclear Power Plants."

The inspectors reviewed the licensee's physical and administrative controls for the storage of highly activated and/or contaminated materials (non-fuel) within the steam separator storage pool, the spent fuel and other storage pools including walkdowns around the perimeters of those pools. In particular, the radiological control for non-fuel materials stored in these pools was evaluated to ensure adequate barriers were in-place to reduce the potential for the inadvertent movement of these materials, and to assess compliance with the licensee's procedures and for consistency with NRC regulatory guidance.

These reviews represented four inspection samples.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the assignment report (AR) database along with individual Ars related to the radiological access and exposure control programs to determine if identified problems were entered into the corrective action program for resolution. In particular, the inspectors reviewed radiological issues which occurred over approximately the 12-month period that preceded the inspection including the review of any HRA radiological incidents (non-PI occurrences identified by the licensee in high

and locked high radiation areas) to determine if follow-up activities were conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

A. Initial problem identification, characterization, and tracking;
B. Disposition of operability/reportability issues;
C. Evaluation of safety significance/risk and priority for resolution;
D. Identification of repetitive problems;
E. Identification of contributing causes; and
F. Identification and implementation of corrective actions.

The inspectors evaluated the licensee's process for problem identification, characterization, and prioritization, and determined if problems were entered into the corrective action program and were being resolved in a timely manner. For potential repetitive deficiencies or possible trends, the inspectors determined if the licensee's self-assessment activities were capable of identifying and addressing these deficiencies, if applicable.

The inspectors reviewed the licensee's documentation for all potential PI events occurring since the NRC's last review of these areas in October 2005 to determine if any of these events involved dose rates greater than 25 Rem/hour at 30 centimeters or greater than 500 Rem/hour at 1 meter or involved unintended exposures greater than 100 millirem total effective dose equivalent (or greater than 5 Rem shallow dose equivalent or greater than 1.5 Rem lens dose equivalent). None were identified.

These reviews represented three inspection samples. Specifically, the samples pertained to the problem identification and resolution program for radiological incidents, a review of the licensee's ability to identify and address repetitive deficiencies, and a review of those radiological incidents and potential PI occurrences of greatest radiological risk.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews and Review of Work Practices in Radiologically Significant Areas

a. Inspection Scope

The inspectors attended the pre-job briefings and accompanied licensee staff to the LHRA boundaries of steam affected areas in preparation for leak inspections at-power. The inspectors evaluated the radiological control, job coverage, and radiation worker practices associated with the inspections. Radiation survey information to support these work activities was reviewed and the radiological job requirements and the access control provisions were assessed for conformity with TSs and with the licensee's procedures.

Job performance was observed to determine if radiological conditions in the work areas

were adequately communicated to workers through the pre-job briefings and area postings. The inspectors also evaluated the adequacy of the oversight provided by the radiation protection staff and the administrative and physical controls used over ingress/egress into these areas.

The inspectors reviewed the licensee's procedures and discussed with RP staff its practices for access into high and very high radiation areas and for areas with the potential for changing radiological conditions such as the drywell shortly after plant shutdown and the Radwaste Building during waste transfer evolutions. The inspectors evaluated the adequacy of the radiological controls and the radiological hazards assessment associated with such entries. Work instructions provided in RWPs and in pre-entry briefing documents were discussed with RP staff to determine their adequacy relative to industry practices.

The inspectors also reviewed the licensee's procedure and practices associated with dosimetry placement and with the use of multiple whole body dosimetry for work in high radiation areas having significant dose gradients for compliance with the requirements of 10 CFR 20.1201(c) and applicable industry guidelines. Additionally, previously completed work in areas where dose rate gradients were subject to significant variation such as work under-vessel were reviewed to evaluate the licensee's practices for dosimetry placement.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.5 High Risk Significant, LHRA and Very High Radiation Area (VHRA) Access Controls

a. Inspection Scope

The inspectors reviewed the licensee's procedures, RP job standards, and evaluated RP practices for the control of access to radiologically significant areas (high, locked high, and very high radiation areas). The inspectors assessed compliance with the licensee's TSs, procedures, the requirements of 10 CFR Part 20, and the guidance contained in Regulatory Guide 8.38. In particular, the inspectors evaluated the RP staff's control of keys to LHRAs and VHRAs, the use of access control guards during work in these areas, and methods and practices for independently verifying proper closure and locking of access doors upon area egress. The inspectors selectively reviewed key issuance/return and door lock verification records and key accountability logs for selected periods in 2006 to determine the adequacy of accountability practices and documentation. The inspectors also reviewed selected records and evaluated the RP staff's practices for radiation protection manager and station management approval for access into Level 2 LHRAs and VHRAs and for the use of flashing lights in lieu of locking areas to verify compliance with procedure requirements and those of 10 CFR 20.1602.

The inspectors discussed with RP staff the controls that were in place for areas that had

the potential to become high radiation areas during radwaste operations to determine if these activities required communication before-hand 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 numerous LHRAs throughout the plant.

These reviews represented three inspection samples.

b. Findings

No findings of significance were identified.

.6 Radiation Worker Performance

a. Inspection Scope

For selected entries into steam sensitive areas at power which took place during the inspection, the inspectors determined whether workers were aware of the radiological conditions, the RWP controls and limits in place, and that their performance had accounted for the level of radiological hazards present.

The inspectors also reviewed radiological problem reports generated primarily in 2006 through August 2006 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 matched the corrective action approach taken by the licensee to resolve the identified problems.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

During job observations and general plant walkdowns, the inspectors evaluated radiation protection staff performance with respect to radiation protection work requirements, conformance with procedures and those requirements specified in the RWP, and assessed proficiency with respect to radiation protection requirements, station procedures, and health physics practices.

The inspectors reviewed selected radiological problem reports generated between mid-2005 and August 2006 to determine the extent of any specific problems or trends that may have been caused by deficiencies with RPT work control, and to determine if the corrective action approach taken by the licensee to resolve the reported problems, if applicable, was adequate.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

2OS2 As-Low-As-Reasonably-Achievable (ALARA) Planning and Controls (71121.02)

.1 Monitoring of Declared Pregnant Women and Dose to Embryo/Fetus

a. Inspection Scope

The inspectors reviewed the licensee's monitoring methods and procedures, radiation exposure controls, and the information provided to declared pregnant women to determine if an adequate program was implemented to limit embryo/fetal dose. The inspectors also reviewed the pregnancy declaration and radiation exposure results for those individuals that declared their pregnancy to the licensee in 2005 and 2006 through August 2006 to determine compliance with the requirements of 10 CFR 20.1208 and 20.2106.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed corrective action reports related to the ALARA program that were generated following the licensee's spring 2006 refueling outage (C1R10) including a Root Cause Investigation Report associated with the licensee's dose performance for that outage. The inspectors interviewed radiation protection staff and evaluated these reports to determine if problems were properly identified, characterized, and prioritized, and to determine the adequacy of the corrective actions taken and proposed. For repetitive outage dose performance issues, the inspectors determined if the licensee recognized the problems, their extent, and had formulated plans to prevent recurrence.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS3 Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program (71122.03)

.1 Reviews of Radiological Environmental Monitoring Reports, Data and Quality Control

- Inspection Scope

The NRC performed a number of confirmatory measurements of water samples to evaluate the licensee's proficiency in collecting and in analyzing water samples for tritium and other radioactive isotopes. The samples were collected independently by the inspectors and by licensee personnel and sent to the NRC's contract laboratory for the analysis of tritium. The NRC and licensee obtained these samples from surface water and groundwater sampling points identified in the licensee's Radiological Environmental Monitoring Program and from onsite and offsite groundwater monitoring wells. In particular, samples were obtained as part of the licensee's environmental study of tritium and potential groundwater contamination (ADAMS ML062760003). While tritium was the primary radionuclide of concern, selected samples were also analyzed for gamma emitting radionuclides and for strontium. The inspectors performed these reviews to assess the licensee's analytical detection capabilities for radio-analysis of environmental samples and its ability to accurately quantify radionuclides to an acceptable level of sensitivity. The criteria used to compare the sample results is provided in Attachment 2, and the results of the comparisons between the NRC and licensee results is provided in Attachment 3.

The inspectors considered the following activities in evaluating the cause of any comparisons that did not result in an agreement:

- re-analysis by licensee or NRC's contract laboratory;
- review of licensee's interlaboratory cross check program results; and
- review of data for any apparent statistical biases.

- Findings

No findings of significance were identified.

4 OTHER ACTIVITIES (OA)

4OA1 Performance Indicator Verification (71151)

Cornerstone: Barrier Integrity

a. Inspection Scope

The inspectors sampled licensee submittals for the performance indicators (PIs) listed below for the periods indicated. To determine the accuracy of the PI data reported during those periods, PI definitions and guidance contained in Revision 4 of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline," were used. The following PI was reviewed:

- Reactor Coolant System Specific Activity

The inspectors reviewed Chemistry Department records including isotopic analyses for 2005 through August 2006 to determine if the greatest dose equivalent iodine (DEI) values determined during steady state operations corresponded to the values reported to the NRC. The inspectors also reviewed selected DEI calculations including the application of dose conversion factors as specified in plant TSs. Additionally, the inspectors accompanied a chemistry technician and observed the collection and preparation of reactor coolant system samples to evaluate compliance with the licensee's sampling procedure protocols. Further, sample analyses and calculation methods were discussed with chemistry staff to determine their adequacy relative to TSs, licensee procedures and industry guidelines.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

.1 Routine Review and Identification of Problems

a. Inspection Scope

As discussed in previous sections of this report, the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that they were being entered into the licensee's corrective action system at an appropriate threshold, that adequate attention was being given to timely corrective actions, and that adverse trends were identified and addressed. Minor issues entered into the licensee's corrective action system as a result of inspectors' observations are generally denoted in the report.

b. Findings

No findings of significance were identified.

.2 Review of licensee's first quarter department coding and analysis report (Semi-annual trend review)

a. Inspection Scope

The inspectors reviewed the licensee's corrective action program trend data for the operations, engineering, maintenance, chemistry, radiation protection, and work control departments to identify any trends or common cause attributes in departmental personnel performance and process controls.

b. Findings

No findings of significance were identified.

.3 Review of issues and corrective actions related to contractor oversight (Annual sample)

a. Inspection Scope

The inspectors reviewed the licensee's procedure MA-AA-1010, "Oversight of Contractors," and selected issue reports, generated between January 2005 and September 2006, to assess the frequency and types of issues the licensee was identifying in its corrective action program, related to deficiencies in contractor oversight. The inspectors also verified that corrective actions initiated for these identified deficiencies were timely and adequately addressed the problems. A list of the issue reports reviewed is contained at the end of this report.

b. Observations

On March 20, 2006, the reactor scrammed due to the main turbine/generator tripping off line. (See Inspection Report 2006-04, Section 4OA3) The licensee determined the root cause of the scram to be loose screws on the generator output current transformer caused by human error during C1R08 in April, 2002. The licensee also identified "heavy reliance on General Electric (GE) services, and lack of review of GE procedures for lifted and landed leads controls", as a contributing cause. Clinton Power Station performed detailed reviews and approvals of other vendor services' procedures, and assigned a corrective action to "coordinate the revision of the GE quality control checklist to confirm that requirements similar to the MA-CL-716-100-1001, "Wire Removal/Jumper Installation", are incorporated", prior to the next refueling outage. The licensee later cancelled this action because the requirement is already present in the MA-AA-1010 procedure.

The licensee identified several other instances of weaknesses in contractor oversight during the time period covered. However, none had consequences similar to the event described above, in that there was no immediate effect on the plant stability or any equipment reliability issues. Minor breakdowns in the contractor oversight process were identified in several departments and involved a variety of plant operating aspects and personnel safety. In April, 2005, an electrical contractor, with the materials department stores supervisor providing oversight, violated a station lockout/tag out procedure. The contractor had lifted the leads of the conductors at the breaker output for the light

fixtures he was replacing, so was protected, but neither the contractor or station supervisor were aware of the procedural requirements for hanging a tag on the lifted leads. Maintenance services accepted a corrective action to provide contractor oversight in the future, with someone who was familiar with the type of work being performed. The design engineering department completed two common cause evaluations related to the modification process. In both reports, the investigator identified weaknesses in oversight of supplemental, or contract/vendor, personnel. These weaknesses usually resulted in poor quality or untimely design completion which in turn affected completion schedules and added work to the station design engineers who were making corrections or additions to drawings that were submitted by supplemental personnel. The corporate Radiological Environmental Monitoring Program (REMP) coordinator generated an issue report addressing inadequate contractor oversight related to the REMP and Meteorology (Met) tower programs. Specific deficiencies identified at Clinton, included "contractor oversight not adequately performed and / or documented, contractor-identified REMP and Met tower deficiencies were not entered into the corrective action program, and contractor-conducted land use census did not document the location of all milking animals within three miles of the plant." The corporation completed a corrective action to update its CY-AA-170-1000, "REMP and Met tower program implementation" procedure, and the station took action to implement the new revision.

During the refueling outage in January 2006, a station radiation protection technician identified an improper posting of a scaffold access ladder in a neutron radiation area, that was initially surveyed and posted by a contract radiation protection technician. Station corrective actions included stressing an increased awareness of surrounding for contract radiation protection technicians, and including the details of this event in the required training for contract radiation protection technicians prior to commencement of the next refueling outage. The licensee's nuclear oversight department conducted an audit of the supplier fundamentals management system in March of 2006, and identified that contract administrators and task managers/field coordinators were not following the requirements of MA-AA-1010, in that they were not making the required fundamentals management system entries. Further review revealed that no entries were made in supplier fundamentals management system by the supply, operations, chemistry, or radiation protection departments between February 2005 and March 2006 (IR 467000).

The final issue report reviewed by the inspectors was IR 526229, and its accompanying quick human performance investigation, which resulted from leakage from the upper manway of the B condensate polisher following liner replacement by a contractor. The inspectors identified two issues of concern that were documented in this investigation. First, neither the field supervisor nor project manager completed an inspection of the seating surfaces of the manway flange prior to installation of the cover by the contractor. The importance of leaving a smooth seating surface, including the method and tools to perform this, was emphasized in the pre-job brief. The inspectors believed that, with this much emphasis placed on the smoothness of the seating surface, that licensee supervisors should have verified the completed work was in compliance with the stated standard prior to allowing the contractor to install the cover. Second, the field supervisor saw the contractor using a torque wrench to tighten the cover bolts. He was aware of the procedural requirement for these bolts to be "snug-tight," and questioned the contractor. When the contractor explained he was using the torque wrench to ensure

even compression on the bolts, both the field supervisor and project manager agreed that this was an enhancement to the “snug-tight” criteria, and allowed the contractor to continue. The contractor independently determined the torque value, the licensee observers concurred, and then the contractor increased the torque value even further. The licensee determined, and the inspectors agreed, that the licensee field supervisor and project manager relied too heavily on the expertise of the contractor and used bad judgement by changing the torque criteria without appropriate reviews.

c. Conclusions

The inspectors concluded that for the time period covered by this review, from January 2005 to September 2006, the licensee did not practice good contractor controls. The licensee failed to follow guidelines as written in MA-AA-1010, on several occasions. Contractors are generally used when extra resources or specialized expertise are required to complete a task. This does not relieve the licensee of it’s responsibility to perform work safely and in compliance with standards. Proper control and oversight of contractors, as documented in MA-AA-1010, is essential to ensure that work is completed to the same standard and expectation level as plant personnel would perform. The inspectors determined that none of the issues reviewed resulted in events that affected overall plant safety or violations of any regulatory requirements and the licensee had previously self identified and documented these deficiencies.

4OA3 Event Follow-up (71153)

a. Scope

Following a reactor scram due to high water level on August 27, 2006, the inspectors observed operations and maintenance activities related to scram response, troubleshooting, and plant recovery. The data gathered during these observations was provided to NRC management to determine the appropriate agency response. The inspectors evaluated the performance of mitigating systems and operator response to the transient. In addition, the inspectors reviewed plant data and interviewed maintenance, engineering, and operations personnel to determine whether the licensee had adequately resolved plant issues prior to restart.

b. Findings

Introduction: Following a self-revealing event, a Green finding and a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion XVI, were identified due to the licensee’s failure to identify and correct a condition adverse to quality. Specifically, the licensee failed to identify and correct the cause of a failure of the Division 4 Nuclear Safety Protection System (NSPS) Inverter in March of 2006.

Description: The NSPS provides reactor protective signals and other plant protective signals to minimize the effects of abnormal reactor plant operating transients to the nuclear plant, plant personnel, and the general public. NSPS also provides for the monitoring of operational safety signals, provides capabilities to perform component calibration and instrument checks, and provides a self test of the essential safety systems logic. On March 26, 2006, Clinton Power Station experienced a failure of the

Division 4 NSPS inverter. This inverter failure resulted in the initiation of the high pressure core spray system (HPCS). The HPCS started, but did not inject, due to the HPCS injection valve not opening.

Following the failure in March, the licensee established a troubleshooting team to determine the cause of the NSPS inverter failure. The troubleshooting team determined that the most probable causes of the failure included the J2 board and the static switch transfer circuit card. The team documented that the Z111 voltage regulator on the J2 board was bad, because it only had five volts output where it was expected to have 24 volts. The licensee replaced the J2 board with a new one. After performing a calibration on the newly installed J2 board, the licensee performed an unloaded run with the inverter in forward transfer position and another 30 minute run with the inverter in reverse transfer position. This unloaded run was completed to validate that the static switch worked properly. The licensee noted no anomalies during the inverter run, and the system was returned to service.

As part of their investigation, the licensee also sent the failed J2 board to the vendor for a followup failure analysis. Following testing of the J2 board, the vendor found that the voltage regulator on the J2 board was functioning properly. Additionally, the vendor's physical examination of the J2 board found the board physically acceptable. After followup discussions with the licensee, the vendor retested the board under testing conditions that exceeded the manufacturer's thermal specification. The vendor completed the second test and again the voltage regulator on the J2 board functioned properly.

Following receipt of this evaluation, the licensee concluded that the apparent cause of the loss of the Division 4 NSPS Inverter was the age-related failure of the Z111 voltage regulator. The licensee also concluded that the inability to repeat the failure did not render the conclusion incorrect. This was based on discussions with the vendor and industry personnel familiar with solid state devices. These discussions suggested that it was not unusual to be unable to duplicate symptoms seen in the field. The issue was closed to corrective actions to upgrade all cards that were reaching a 10-year service life during system outage windows.

On August 27, 2006, Clinton Power Station experienced an automatic reactor scram on high water level condition (>52 inches). This high water level condition was created by the automatic start and injection of HPCS and a subsequent trip of the 1A reactor recirculation pump. The HPCS injection and recirculation pump trip occurred because of a failure of the Division 4, NSPS Inverter.

The licensee's investigation into this event determined that the inverter failure occurred because of an inadequate/faulty solder joint on a backplane connector. This conclusion was verified by the vendor and PowerLabs during post-event testing of the back plane connector. Both the vendor and PowerLabs concluded that poor quality soldering (lack of solder flow through etched circuit board eyelet) resulted in pooling (no penetration through eyelet) of solder at common connection between the R103 resistor, the J2 board, and DC to DC converter.

A licensee investigation also determined that the solder joint most likely had been in that condition since receipt from the manufacturer in August 1998. This board was originally received from the vendor in 1979, as part of original construction. However, in 1998, the licensee identified during maintenance activities that this backplane connector contained a high resistance connection to chassis ground, excess flux on a solder joint, and a missing mounting insert. The licensee sent the backplane connector board back to the manufacturer for refurbishment in June 1998. The vendor noted split eyelets for the R103 resistor, poor solder connection, and high flux on the solder surface. As mentioned above, the board was sent back to the licensee in August 1998 and placed in the warehouse until February 2006 when it was installed in the Division 4 inverter during C1R10. The licensee or vendor could not find documentation on how the issues identified by the vendor in June through August 1998 were corrected. Using this information, the licensee concluded that the faulty solder joint on a back plane connector was also the cause of the March 26, 2006, inverter failure.

Analysis: The inspectors determined that the failure to appropriately identify and correct the cause of the Division 4 NSPS inverter in March was a performance deficiency. The deficiency was determined to be more than minor because it resulted in a reactor scram and was associated with the equipment performance attribute of the initiating events cornerstone. The issue affected the initiating events objective of limiting the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as normal plant operations. The finding also affected the cross-cutting area of problem identification and resolution in that the actual cause of the March 26, 2006, inverter failure was not correctly identified, resulting in the resolution not addressing the cause. The inspectors conducted a Phase 1 Significance Determination Process screening and determined that, despite being a transient initiator, this issue would not affect the availability of a mitigating system. Therefore, this issue screened out as a Green issue.

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, states in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective materials and equipment and nonconformances are promptly identified and corrected. Contrary to the above, following the March 26, 2006, failure of the Division 4 NSPS inverter, the licensee failed to identify and correct a condition adverse to quality. This was a violation. However, because this violation was of very low safety significance, and because the issue was entered into the licensee's corrective action program as Issue Reports 524365 and 524523, the issue is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy **(NCV 05000461/2006007-01)**.

Corrective actions for this issue included revising the procurement procedure to disallow any backplane connector manufactured under the same process as the failed board. Additionally, the licensee commenced a common cause evaluation to help the licensee plan and develop additional corrective actions to address whether there are issues involving the licensee's proficiency in identifying causes of operational occurrences.

4OA6 Meetings

.1 Exit Meeting

The inspectors presented the inspection results to Mr. B. Hanson and other members of licensee management at the conclusion of the inspection on October 12, 2006. 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 inspection with Mr. M. Friedman on August 2, 2006.
- Occupational radiation safety radiological access control and ALARA inspection with Mr. B. Hanson and other licensee staff on September 1, 2006.
- Public Radiation Safety with Mr. W. Scott on October 12, 2006.

Attachments:
1. Supplemental Information
2. Split Sample Report
3. Tritium Sample Results

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
B. Hansen, Site Vice President
M. McDowell, Plant Manager
J. Cunningham, Work Management Director
G. Vickers, Radiation Protection Manager
R. Frantz, Regulatory Assurance Representative
P. Simpson, Regulatory Assurance Director
C. Vandenburgh, Nuclear Oversight Manager
J. Domitrovich, Maintenance Director
D. Schavey, Operations Director
B. Scott, Chemistry Manager
J. Lindsay, Training Director
C. Williamson, Security Manager
R. Peak, Site Engineering Director
T. Chalmers, Shift Operations Superintendent
M. Friedman, Emergency Preparedness Manager

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000461/2006007-01 NCV	The inspectors determined that the failure to appropriately identify and correct the cause of the Division 4 NSPS inverter in March was a performance deficiency.

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 pat of it, unless this is stated in the body of the inspection report.

1R01 Adverse Weather
WC-AA-107,Seasonal readiness; Revision 2
CPS 1860.02,Summer readiness operation; Revision 0a
System engineering notebook, Condensate system, 2006 summer readiness review; December 2, 2005
IR 314701, Entry into 4002.01 Abnormal reactor pressure vessel level/loss of feedwater; March 18, 2005
IR 329215, Operational technical decision making fails to process hotwell setpoint change per CC-AA-112; April 27, 2005
WO 504068, Rebuild 1CD01PA motor to reduce vibration level; June 14, 2006
WO 505127, Perform hotwell cleaning of main condenser; December 16, 2005
WO 793588, Perform loop calibrations for hotwell level loops 1CD057 and 1CD068; May 25, 2006
Engineering Change 354802, Revise operating logic to allow operation of four condensate pumps; Revision 0
System engineer notebook, Turbine building ventilation, 2006 summer readiness review; December 1, 2005
IR 64596, Opportunity for improvement in plant startup procedures; July 23, 2001
WO 806181, Reinstall vent and drain caps and return cooling; May 25, 2006
WO 830697, 1VT02A cooling coil leaks; May 19, 2006
System engineer notebook, Service air and instrument air, 2006 summer readiness review; November 30, 2005
IR 170057, Preventive maintenance to run off-service and standby service air compressors; August 1, 2003
IR 330988, Degrading 0SA01C service air compressor performance trend; May 2, 2005
WO 794373, Perform calibration procedure 8675.01 on 2SA01C; June 15, 2006
WO 866905, Evaluate need for shifting service air compressors; May 11, 2006
WO 869090, Perform calibration procedure 8675.01 on 1SA01C; November 21, 2005
EN-CL-402-2005, Extreme heat implementation plan; Revision 2
CPS 3800.02, Area operator logs; Revision 18e

1R04 Equipment Alignments
CPS 3312.01E001, “Residual Heat Removal Electrical Lineup,” Revision 14
CPS 3312.01V001, “Residual Heat Removal Valve Lineup,” Revision 16a
M05-1075, P&ID Residual Heat Removal, sheets 2-4

1R05 Fire Protection
USAR Appendix E, section 3.3.2.4 Fire area C-2, Elevation 778' 0" Containment, Revision 11
USAR Appendix E, section 3.3.2.6 Fire area C-2, Elevation 803' 3" Containment, Revision 11
USAR Appendix E, section 3.3.2.8 Fire area C-2, Elevation 828' 3" Containment, Revision 11
1R06 Flood Protection

CPS 43.03,02, Abnormal lake level; Revision 9a
CPS 4304.02, Flooding; Revision 4d
IR 340193, Cut and remove shrubs and trees from main dam crest roadway; June 2, 2005
IR 369393, Expanded scope of minor cracks in dam spillway wall; September 1, 2005
IR 385506, Storm drain plugged with dirt and gravel; October 13, 2005
IR 486448, Water flowing out of manhole; May 4, 2006
IR 519277, Main control room ground alarm due to OLSWM180B/C submerged in water; August 12, 2006
IR 364739, Water leaking through penetration on south diesel generator building wall; August 19, 2005
IR 493210, Roof drains observed as plugged during inspections; May 24, 2006
IR 426036, Clogged drains resulting in several inches of standing water; November 20, 2005

1R12 Maintenance Effectiveness
Maintenance rule system performance evaluation, Feedwater system, July 20, 2006
System health overview report, Feedwater system, June 2006
System health quarterly report, Feedwater system, Second quarter, 3005
Plant health committee system presentation, Feedwater system, June 2006
Maintenance rule performance criteria report, Feedwater system, July 28, 2006
Maintenance rule scoping/risk significance report, Feedwater system, July 25, 2006
IR 255968, Motor driven reactor driven feed pump minimum flow valve has had multiple failures, September 23, 2004
WO 679833, Unacceptable results of the calibration of 1FW010C, July 8, 2006
IR 360580, 1FW01KB-Oil leak on outboard bearing on B turbine driven reactor feed pump, August 5, 2005
Prompt investigation 350580, Oil leak on outboard bearing on B turbine driven reactor feed pump, August 5, 2005
WO 872888, Verify the deflector clearance on 1FW01PA, May 25, 2006
IR 361403, Turbine driven reactor feed pump 1B low pressure stop valve did not open when feed pump was reset, August 9, 2005
WO 836096, Turbine driven reactor feed pump B did not trip until pushbutton released; November 19, 2005
WO 841875, Inspect turbine driven reactor feed pump B low pressure control valve poppets and linkage, May 18, 2006
IR 442308, 1FW010C failed to operate automatically, January 15, 2006
WO 883855, 1FW010C failed to operate automatically, January 24, 2006
IR 448004, Unexpected behavior of reactor feed pump 1C flow control valve 1FW004, January 31, 2006
WO 889035, Unexpected behavior of reactor feed pump 1C flow control valve 1FW004, February 17, 2006
IR 459037, 1FW01PC failed post maintenance test for motor driven reactor feed pump 1C inboard seal drain, February 26, 2006
WO 896678, 1FW01PC failed post maintenance test for motor driven reactor feed pump 1C inboard seal drain, March 1, 2006
IR 492224, 1FW01PC outboard pump seal leaking, May 21, 2006
WO 924957, 1FW01PC outboard pump seal leaking, June 14, 2006
IR 456656, 1FW010C air line reversed, February 21, 2006

IR 456899, 1FW01PC motor driven reactor feed pump windmilling without bearing oil flow, February 22, 2006
WO 883910, 1FW01PC water leak on inboard seal assembly and drain line, June 8, 2006

1R19 Post Maintenance Testing
IR 497507, 1DG01KA12: #1 test valve body loose on Division 1 diesel generator 12 cylinder; June 7, 2006
IR 497613, 1DG01KA16: #2 test valve body loose on Division 1 diesel generator 16 cylinder; June 7, 2006
WO 929149-02, Operations verify no leakage on 1DG01KA #1 test valve; July 5, 2006
WO 929154-02, Operations verify no leakage on 1DG01KA #2 and #5 test valve; July 5, 2006
WO 18890, Block / disconnect / remove hydramotor for 1VX59YA; September 25, 2006
CPS 3412.01, Essential switchgear heat removal; Revision 14d
WO 955661, RCIC turbine stay at correct speed during 9054.01C004; September 14, 2006
IR 531065, RCIC turbine stay at correct speed during 9054.01C004; September 14, 2006
WO 00703234-04, OP PMT - For 1E12C002C Pump Seal Cooler
ASME Boiler and Pressure Vessel Code, Section III, Nuclear Power Plant Components, Division 1, Subsection NC, Class 2 Components, 1977 Edition.
WO 00767982-01, IM Perform Flowscan in Support of the AOV Program 1SX027C

1EP4 Emergency Action Level and Emergency Plan Changes
Clinton Power Station Annex to the Exelon Standardized Emergency Plan; Revision 8

OA1 Performance Indicator Verification
AR 00525678; Incorrect Dose Conversion factors Used for DEI; dated August 30, 2006
EPA Federal Guidance Report No.11; Limiting Values of Radionuclide Intake and Dose Conversion factors for Inhalation, Submersion and Ingestion; 1989
CPS 6721.01; Reactor Water Radioisotopic Analysis; Revision 8b
CPS 3222.10; Reactor Sample Station (1G33-Z020); Revision 9
AR 00250530; 1G33-Z020 Flow Meters Dirty and Difficult to Read; dated September 7, 2004
ED Dose/Rate Alarm Transaction Reports; October 2005 - August 2006
Internal Dose Assessment Summary Data; 2006 thru August 2006

OA2 Identification and Resolution of Problems
MA-AA-1010, Oversight of contractors; Revision 7
IR 321125, Contractor changed light fixtures without tag out; April 5, 2005
IR 379786, Perform a common cause analysis on modification process issue reports; September 29, 2005
IR 467473, Perform a common cause analysis on modification program effectiveness; March 17, 2006
IR 438349, Inadequate contractor oversight resulted REMP deficiencies; January 3, 2006
IR 444653, CIR10 Scaffold on 781 containment requires nuetron signage; January 23, 2006
IR 468357, Reactor scram due to main turbine/generator trip; March 20, 2006
IR 467000, NOS identified contractor observation not documented in supplier FMS; March 16, 2006
IR 526229, Condensate polisher B upper manway leaked on refilling condensate poliser B; August 31, 2006

2OS1 Access Control to Radiologically Significant Areas
RP-AA-460; Controls for High and Very High Radiation Areas; Revision 10
RP-CL-460-101; Radiological Key Control and Area Access Requirements; Revision 2
RP-AA-460-1001; Additional High Radiation Exposure Control; Revision 1
Records of Weekly Locked High Radiation Door Verification; Selected 2006 Records
CPS 7200.32; Drywell Entries; Revision 2b (and associated data sheets and survey data for August 28, 2006 entries following unplanned shutdown)
RWP 10005873; 2006 Steam Affected Area Work; Revision 2
RWP 10005869; 2006 ECCS Work (HRAs and LHRAs); Revision 2
RWP 10005867; 2006 Recirculation System Work (HRAs and LHRAs): Revision 2
RP-AA-210; Dosimetry Issue, Usage, and Control; Revision 6
Fuel and Containment Building Storage Pool Survey and Inventory Data; dated July 13 - August 24, 2006
AR 00455349; Improvement to HRA/LHRA Controls; dated February 17, 2006
AR 00329464; Evaluate Number of Dose/Rate ED Alarms; dated April 27, 2005
ARs 00450193, 00319568, 00451940, 00493111, 00372275; ED Alarms; dated September 11, 2005 - May 20, 2006
CPS 7200.33; Conduct of Transfer Evolutions; Revision 4d
NOS Audit NOSA-CPS-05-06; Health Physics Functional Area Audit Report; dated July 27, 2005

2OS2 As-Low-As-Reasonably-Achievable Planning and Controls
AR 00468950; Condensate Polisher Filter Replacement Dose Reevaluated; dated March 21, 2006
RP-AA-270; Prenatal Radiation Exposure; Revision 3
Embryo/Fetal Dose Reports, Exposure History Summaries and Declaration of Pregnancy Forms; January 2005 - August 2006
LS-AA-125-1001; Root Cause Investigation Report; C1R10 Exposure Estimates Exceeded; dated July 17, 2006
Focused Area Self-Assessment Report; C1R10 Outage ALARA Effectiveness; dated May 19, 2006

LIST OF ACRONYMS USED

ADAMS	Agency wide Documents Access and Management System
ALARA	As-Low-As-Reasonably-Achievable
ANS	Alert and Notification System
AR	Assignment Report
DEI	Dose Equivalent Iodine
EP	Emergency Preparedness
ERO	Emergency Response Organization
HPCS	High Pressure Core Spray
HRA	High Radiation Area
IMC	Inspection Manual Chapter
LHRA	Locked High Radiation Area
MR	Maintenance Rule
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NSPS	Nuclear Safety Protection System
ORM	Operations Requirements Manual
PARS	Publicly Available Records
PI	Performance Indicator
RP	Radiation Protection
RWP	Radiation Work Permit
SDP	Significant Determination Process
TS	Technical Specifications
USAR	Updated Safety Analysis Report
VHRA	Very High Radiation Area

Attachment 2

Confirmatory Measurements Comparison Criteria

The NRC applied the comparison criteria contained in NRC Inspection Procedure (IP) 84750, “Radioactive Waste Treatment, and Effluent and Environmental Monitoring,” dated March 15, 1994, to determine if the licensee’s measurement results were in statistical agreement with the NRC measurement results. For the purposes of this comparison, the NRC result is divided by its associated uncertainty to obtain the resolution. (Note: For purposes of this process, the uncertainty is defined as the relative standard deviation, one sigma, of the NRC’s contract laboratory’s analysis.) The licensee’s result is then divided by the corresponding NRC result to obtain the ratio (licensee result/NRC). The licensee's measurement is in agreement if the value of the ratio fall within the limits shown in the following table for the corresponding resolution.

Resolution	**Acceptance Range (Licensee Result/NRC Result)**
<4	Technical Judgement[1]
4-7	0.5-2.0
8-15	0.6-1.66
16-50	0.75-1.33
51-200	0.80-1.25
>200	0.85-1.18

For analyses that are below the minimum detectable concentration (either for the licensee or NRC’s contract laboratory), the measurements are determined to be in agreement if both are below the minimum detectable concentration or if one has an uncertainty that is within the minimum detectable concentration.

[1]The inspectors used technical judgement in reviewing results having a relative 1 sigma uncertainty greater than 25 percent (i.e., resolution less than 4). In these cases, the values were typically very close to the laboratory’s detection capabilities, and greater variability was expected. Consequently, these sample comparisons were made based on the inspectors’ qualitative review of the analytical results.

Attachment 3

Tritium Sample Results
Clinton Generating Station

#	Collection Date	NRC				Licensee			Ratio: Licensee to NRC	Result
		Sample ID	Tritium pCi/L ± uncertainty		MDC	Sample ID	Tritium pCi/L ± uncertainty			
1	05/24/2006	C-06-1-01	< MDC		190	MW-CL-16S	< MDC		n/a	Agreement
2	05/24/2006	C-06-1-02	< MDC		190	SW-CL-5	< MDC		n/a	Agreement
3	05/23/2006	C-06-1-03	< MDC		190	MW-CL-12S	< MDC		n/a	Agreement
4	05/23/2006	C-06-1-04	< MDC		190	MW-CL-13S	230	114	n/a	Agreement
5	05/23/2006	C-06-1-05	< MDC		190	MW-CL-13I	< MDC		n/a	Agreement
6	05/23/2006	C-06-1-06	< MDC		190	MW-CL-19S	< MDC		n/a	Agreement
7	05/23/2006	C-06-1-07	< MDC		190	MW-CL-20S	< MDC		n/a	Agreement
8	05/24/2006	C-06-1-08	< MDC		190	MW-CL-14S	201	107	n/a	Agreement
9	05/23/2006	C-06-1-09	< MDC		190	MW-CL-15S	< MDC		n/a	Agreement
10	05/23/2006	C-06-1-10	< MDC		190	MW-CL-15I	< MDC		n/a	Agreement
11	05/25/2006	C-06-1-11	< MDC		190	MW-CL-17S	< MDC		n/a	Agreement
12	05/23/2006	C-06-1-12	< MDC		190	MW-CL-18S	< MDC		n/a	Agreement
13	05/23/2006	C-06-1-13	< MDC		190	MW-CL-18I	< MDC		n/a	Agreement
14	05/25/2006	C-06-1-14	< MDC		190	MW-1	< MDC		n/a	Agreement
15	05/25/2006	C-06-1-15	< MDC		190	MW-CL-2	< MDC		n/a	Agreement
16	05/24/2006	C-06-1-16	< MDC		190	MW-B3	< MDC		n/a	Agreement
17	05/23/2006	C-06-1-17	< MDC		190	SW-CL-1	< MDC		n/a	Agreement
18	05/24/2006	C-06-1-18	< MDC		190	SW-CL-20S	< MDC		n/a	Agreement
19	05/24/2006	C-06-1-19	< MDC		190	SW-CL-3	< MDC		n/a	Agreement
20	05/24/2006	C-06-1-20	< MDC		190	SW-CL-5	< MDC		n/a	Agreement
21	05/24/2006	C-06-1-21	< MDC		190	SW-CL-6	< MDC		n/a	Agreement
22	06/28/2006	C-06-2-01	< MDC		180	*CL-99	< MDC		n/a	Agreement
23	06/28/2006	C-06-2-02	< MDC		180	*CL-91	< MDC		n/a	Agreement
24	06/28/2006	C-06-2-03	< MDC		180	*CL-13	< MDC		n/a	Agreement
25	06/28/2006	C-06-2-04	< MDC		180	*CL-7D	< MDC		n/a	Agreement

Tritium Sample Results
Clinton Generating Station

#	Collection Date	NRC				Licensee			Ratio: Licensee to NRC	Result
		Sample ID	Tritium pCi/L ± uncertainty		MDC	Sample ID	Tritium pCi/L ± uncertainty			
26	06/28/2006	C-06-2-05	< MDC		180	*CL-12R	< MDC		n/a	Agreement
27	06/28/2006	C-06-2-06	< MDC		180	*CL-12T	< MDC		n/a	Agreement
28	06/28/2006	C-06-2-07	< MDC		180	*CL-90	< MDC		n/a	Agreement
29	06/28/2006	C-06-2-08	< MDC		180	*CL-14	< MDC		n/a	Agreement
30	06/27/2006	C-06-2-09	< MDC		180	1A	< MDC		n/a	Agreement
31	06/27/2006	C-06-2-10	< MDC		180	1B	< MDC		n/a	Agreement
32	06/27/2006	C-06-2-11	< MDC		180	1C	< MDC		n/a	Agreement
33	06/27/2006	C-06-2-12	190	110	180	1D	227		1.19	Agreement
34	06/27/2006	C-06-2-13	< MDC		180	1E	< MDC		n/a	Agreement

MDC - Minimum Detectable Concentration
* REMP Sample Locations

NRC sample uncertainties are based on two sigma counting statistics.