

November 6, 2007

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 05000461/2007004

Dear Mr. Crane:

On September 30, 2007, 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 4, 2007, with Mr. F.A. Kearney 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, three self-revealed findings of very low safety significance (Green) were identified. All of these issues involved violations of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these violations as Non-Cited Violations consistent with Section VI.A.1. of the NRC Enforcement Policy.

If you contest the subject or severity of a Non-Cited Violation, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001; with copies to the Regional Administrator, 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 NRC Resident Inspector at the Clinton Power Station.

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

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Sincerely,

/RA/

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

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

Enclosure: Inspection Report No. 05000461/2007004
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
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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Chief Operating Officer
Senior Vice President - Nuclear Services
Vice President - Operations Support
Vice President - Licensing and Regulatory Affairs
Manager Licensing - Clinton Power Station
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Letter to C. Crane from M. Ring dated November 6, 2007

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NRC INTEGRATED INSPECTION REPORT 05000461/2007004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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

Report No: 05000461/2007004

Licensee: AmerGen Energy Company, LLC

Facility: Clinton Power Station

Location: Route 54 West
Clinton, IL 61727

Dates: July 1 through September 30, 2007

Inspectors: B. C. Dickson, Senior Resident Inspector
D. Tharp, Resident Inspector
A. Barker, Senior Project Engineer
J. McGhee, Reactor Engineer
A. Koonce, Reactor Engineer
D. Melendez, Reactor Engineer
M. Mitchell, Health Physicist

Approved by: Mark Ring, Chief
Branch 1
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000461/2007004, AmerGen Energy Company LLC, on 07/01/07 - 09/30/2007 Clinton Power Station, Event Follow-up.

This report covers a three month period of baseline resident inspection and announced baseline inspection on radiation protection. The inspection was conducted by Region III inspectors and the resident inspectors. Three Green findings, involving Non-Cited Violations, 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 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: Barrier Integrity

- Green. A performance deficiency involving a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion IV, "Procurement Document Control," was self revealed following receipt of laboratory results that showed that Division 1 control room ventilation system charcoal filter penetration values were higher than allowed by Clinton's Technical Specifications. This issue occurred because the licensee failed to establish proper purchase specifications for charcoal used in the control room ventilation system. Additionally, this issue led to Division 1 control room ventilation subsystem being inoperable from May 9 through May 16, 2005, concurrent with the Division 2 control room ventilation subsystem being inoperable due to planned maintenance from May 9 through May 14, 2005. Licensee corrective actions included entering the issue into the corrective action program, revising the charcoal purchase specifications, and adding limitations to work orders to prevent scheduling work that could impact the operability of redundant systems.

This issue was more than minor because it affected the objective of the Barrier Integrity cornerstone of assuring that physical design barriers protect the public from radionuclide releases caused by accidents or events. Additionally, this issue is associated with the barrier performance attribute of maintaining Radiological Barrier functionality of the control room. Failure to ensure adequate purchase specifications resulted in there being a period where both trains of control room ventilation were inoperable without the knowledge of the operators. The issue was of very low safety significance because it only represented a degradation of the radiological barrier function provided for the control room. (Section 4OA3.1)

- Green. The inspectors identified a performance deficiency involving a Non-Cited Violation of Technical Specifications when the licensee failed to meet the required completion time for an action statement in Technical Specification 3.4.5. Specifically, Technical Specification 3.4.5 does not allow reactor coolant system pressure boundary leakage and requires a shutdown to Mode 3 within 12 hours if pressure boundary

leakage is discovered. Upon entry into the drywell following a shutdown of the reactor on June 19, 2007, the licensee discovered the existence of reactor coolant system pressure boundary leakage. Indications of the leakage had been discovered at 0433 on June 18, 2007, but the plant was not placed in Mode 3 until approximately 31 hours later at 1125 on June 19, 2007. Licensee corrective actions included replacing the leaking flexible hose, scheduling replacement of other flexible hoses, and establishing a preventive maintenance replacement frequency for the flexible hoses.

This issue was more than minor because operating with a degraded pressure boundary affected the reactor coolant system equipment and barrier performance attribute of the Barrier Integrity cornerstone, in that, reactor coolant system pressure boundary leakage results in a reduction in the reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The issue was of very low safety significance because the potential maximum size of the leak was well within the capability of the available mitigating equipment. The finding is related to the cross-cutting area of Human Performance (Decision Making) in that operators had initially entered TS 3.4.5 for pressure boundary leakage, but later chose not to treat the leakage as pressure boundary leakage, and treat it as unidentified leakage until the actual location could be determined (H.1(b)). (Section 4OA3.2)

- Green. A performance deficiency involving a Non-Cited Violation of 10 CFR Part 50 Appendix B, Criteria V, "Instructions, Procedures, and Drawings," was self-revealed following an event on August 17, 2007, where a spent fuel bundle being moved to a temporary storage location came in contact with and rested upon another fuel bundle seated in its storage location. The licensee procedure that governs spent fuel pool movement failed to provide adequate guidance on how high to lift the fuel bundle prior to traversing across the spent fuel pool. Licensee corrective actions included revising the fuel handling procedure to provide specific instructions regarding how high to lift a fuel bundle during spent fuel pool movements.

This issue was more than minor because it affected the barrier integrity objective of assuring that physical design barriers protect the public from radionuclide releases caused by accidents or events. The inspectors determined that this issue only degraded the Fuel Cladding Barrier and its associated cornerstone, therefore, this issue was of very low safety significance. This finding is related to the cross-cutting area of Human Performance (Resources) because the licensee did not provide complete and accurate procedures. Specifically, the procedure relied on the skills of the operator, did not provided specific values on how high to lift a fuel bundle, and did not require independent verification (H.2(c)). (Section 4OA3.3)

B. Licensee-Identified Violations

No findings of significance were identified.

REPORT DETAILS

Summary of Plant Status

The plant was operated at approximately 96 to 97 percent rated thermal power (maintaining 100 percent electrical output) throughout the inspection period with several derates of approximately 2-3 percent at the requests of the grid operator. The grid operator made those requests due to concerns regarding grid stability.

Exceptions to relatively steady state operation occurred on July 1, 2007, when operators lowered reactor power to approximately 82 percent to make repairs to an electrohydraulic control system leak on the #4 main turbine control valve and on September 9, 2007, when operators lowered reactor power of approximately 75 percent to perform control rod pattern adjustments, quarterly main turbine valve testing and main steam isolation valve testing.

1. REACTOR SAFETY

Cornerstone: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

The inspectors evaluated site readiness for severe thunderstorms prior to arrival of weather fronts associated with severe thunderstorms, high winds and rain that resulted in severe thunderstorm and tornado watches being identified. On each occasion operation's shift manning was verified to be adequate and in accordance with site procedures. Site walkdowns were performed to evaluate potential vulnerabilities for missile generation during high winds or tornados and to assess the implementation of the site procedures. The communications protocol between the control room and the transmission system operator was also reviewed during the inspections and examples of the quality of communication were observed due to severe weather conditions during the inspection.

This review represented two inspection samples of review prior to impending weather conditions.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments (71111.04Q)

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 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 (IRs) 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 Updated Safety Analysis Report (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 reactor core isolation cooling system and the Division 1 standby gas treatment system while Division 2 was out of service.

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 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, and their potential to impact equipment which could cause a plant transient, 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 seven samples by inspection of the following areas:

- Fire Area D-5d, Division 1 diesel generator room;
- Fire Area A-2b, Division 1 residual heat removal pump and heat exchanger room;
- Fire Area A-1, 707' auxiliary building, general access area;
- Fire Area CB-1c, 719' control building, heating ventilation and air conditioning equipment area;
- Fire loading and associated fire hazard permits in approved storage area;

- Fire Area A-2 and Fire Zone A-2a, reactor core isolation cooling pump room; and
- Fire Area D-6a, b, Division 2 diesel generator and day tank room.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

The inspectors observed the flood protection equipment in the B and C residual heat removal pump rooms. 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 internal flooding protection measures, reviewed the licensee's flooding mitigation procedures, and reviewed issue reports related to possible flood protection issues. Additionally, plant walkdowns were performed to verify design barriers were properly maintained. Penetrations between rooms, watertight doors, electrical conduit seals and covers, and room drains were inspected to verify material condition met design assumptions. The inspectors performed a review of the station's maintenance database to verify preventative maintenance was current and equipment deficiencies were being appropriately reported and resolved. Additionally, the inspectors reviewed the maintenance rule scoping and performance criteria and determined that the function was being tracked appropriately. The corrective action program was also reviewed for the past 12 months for issues related to internal flood protection. The inspectors completed a one inspection sample by completing the internal flooding review of the 'B' residual heat removal pump and heat exchanger room and the 'C' residual heat removal pump room.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07A)

a. Inspection Scope

The inspectors verified readiness and availability of the Division 3 emergency diesel generator heat exchanger by performing the following activities:

- Observed in-progress eddy current testing and reviewed post-eddy current testing results;
- Observed the condition of heat exchanger end bell and tube sheet during walkdown;
- Reviewed the results of tube inspections and outage work packages to determine whether maintenance was performed in accordance with the licensee's maintenance program for heat exchangers and reviewed issue reports to verify that deficiencies were identified and incorporated into the licensee's corrective action program;

- Reviewed the evaluation and corrective actions for Action Request 678934, “Div III DG HX (1DG13A) Chemistry Results,”
- Reviewed the evaluation and corrective actions for Action Request 675035, “Excessive Erosion Discovered on the Flange Faces 1VH03A,” and
- Verified the heat exchanger was properly classified under the Maintenance Rule and identified issues received appropriate program reviews.

This inspection represented the completion of one annual sample.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification (71111.11)

a. Inspection Scope

The inspectors observed an evaluation of an operating crew on September 19, 2007.

The scenario (ESG LOR Exam 87d) consisted of a failure of the ‘A’ reactor recirculation flow control valve, a failure to scram using the manual pushbuttons, unisolable flooding in emergency core cooling system pump room and an emergency depressurization.

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. Additionally, simulator physical fidelity and training department actions to incorporate current plant deficiencies and annunciators were evaluated.

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

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 Part 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. The inspectors also reviewed issue reports and associated documents for appropriate identification of problems, entry into the corrective action system, and appropriateness of planned or completed actions. The inspectors completed three samples by reviewing the following:

- Division 1 DC Battery and DC distribution;
- Containment and reactor vessel isolation system and
- Reactor core isolation cooling system primary containment isolation valves.

1R13 Maintenance Risk Assessments and Emergent Work Control (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:

- Reviewed licensee risk assessment and subsequent area operator staging associated with standby liquid control system pump and valve quarterly operability run;
- Reviewed licensee's risk assessment and detailed work plan for reserve auxiliary transformer static VAR compensator prior to the removal of test equipment;
- Reviewed licensee risk assessment for planned surveillance on high pressure core spray system;
- Reviewed licensee risk assessment associated with six-year preventative maintenance of the Division 3 diesel generator (including walkdown of risk sensitive area to ensure proper flagging);
- Reviewed the licensee's risk assessment of 138 kv line work by Ameren IP and subsequent emergency reserve auxiliary transformer outage.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations (71111.15)

a. Inspection Scope

The inspectors reviewed the following 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 four samples of operability determinations and evaluations by reviewing the following:

- Operability Evaluation 655836: Residual heat removal water leg pump supply check valves (1E12F084A and 1E12F085A) failure to close;
- Operability Evaluation 630815-03: Division 1, 2, and 3 shutdown service water valves (1SX025A, 1SX025B, and 1SX025C) exceed the vendor allowable deflection;
- Action Request 667663: Through body leak of shutdown service water valve (1SX019B);
- Action Request 660299: Type C Integrated leakage rate testing for test lines going through containment penetration 1MC-152 not being performed;
- Operability Evaluation 664280: Through wall leak on shutdown service water line (1SX20AB); and
- Operability Evaluation 671001: Division 3 essential switchgear/shutdown service water piping wall thickness below minimum screening criteria.

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 Technical Specifications (TS) 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:

- Work Order 00318466: Troubleshooting and repair of Division 2, 250 Volt battery charger (1DC07E);
- Work Order 01048964-03: Post maintenance testing for optical isolator pair (manual scram push button) P664-A-A81-A313/A305;

- Work Order 00914954-03: Replacement of 1SX-303A;
- Work Order 00909977-04: Replacement of standby gas treatment system pressure switches;
- Work Order 00909977-02: Replacement of combustible gas control system pressure switch;
- Work Order 00969911: Replacement of Division 1 main control room ventilation supply fan; and
- Reviewed post maintenance testing of Division 3 emergency diesel generator following six year maintenance.

Performance of this review comprised seven samples.

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 Technical requirements Manual (TRM), 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.

Seven samples were completed.

The inspectors evaluated the following surveillance tests:

- CPS 9069.01, Shutdown service water operability test pump 'B';
- CPS 9000.01, Control room surveillance log and CPS 3315.02 Leak detection;
- CPS 9051.01, High pressure core spray and water leg pump operability;
- CPS 9052.01, Low pressure core spray and residual heat removal 'A' pumps water leg pump operability;
- CPS 9052.04, Low pressure core spray and residual heat removal 'A' vent and fill;
- CPS 9054.01, Reactor core isolation cooling operability; and
- CPS 9080.02, Diesel generator '1B' operability - manual and quick start operability.

These tests included three in-service testing (IST) surveillance samples and one reactor coolant system leakage detection surveillance sample.

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications (7111.23)

The inspectors reviewed and evaluated the following temporary plant modification on risk significant equipment 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 the 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 List of Documents Reviewed.

The inspectors completed one inspection sample by reviewing the following temporary modification:

- Defeating Inclined fuel transfer system upender/fuel handling platform Interlock, Revision 0.

b. Findings

No findings of significance were identified.

2. EMERGENCY PREPAREDNESS

1EP6 Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors observed the emergency response activities associated with the drill conducted on August 9, 2007. Specifically, the inspectors verified that the emergency classification and simulated notifications were properly completed, and that the licensee adequately critiqued the training. Additionally, the inspectors observed licensee activities during the drill in the simulated control room and the Technical Support Center (TSC).

The drill included an explosion in the Division 2 emergency diesel generator and a subsequent anticipated transient without a scram.

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 the licensee's Occupational Exposure Control cornerstone performance indicators (PIs) to determine whether or not the conditions surrounding the PIs had been evaluated, and identified problems had been entered into the corrective action program for resolution. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Plant Walkdowns and Radiation Work Permit Reviews

a. Inspection Scope

The inspectors reviewed licensee controls and surveys in the following two radiologically significant work areas within radiation areas, high radiation areas and airborne radioactivity areas in the plant and reviewed work packages which included associated licensee controls and surveys of these areas to determine if radiological controls including surveys, postings and barricades were acceptable:

- Spent fuel pool re-rack project; and
- Phase separator resin transfer.

These reviews represented one inspection sample.

The inspectors reviewed the radiation work permits (RWP) and work packages used to access these two areas and other high radiation work areas to identify the work control instructions and control barriers that had been specified. Electronic dosimeter alarm set points for both integrated dose and dose rate were evaluated for conformity with survey indications and plant policy. Workers were interviewed to verify that they were aware of the actions required when their electronic dosimeters noticeably malfunctioned or alarmed. These reviews represented one inspection sample.

The inspectors walked down and surveyed (using an NRC survey meter) these two areas to verify that the prescribed radiation work permit, procedure, and engineering

controls were in place, that licensee surveys and postings were complete and accurate, and that air samplers were properly located. These reviews represented one inspection sample.

The inspectors reviewed RWPs for airborne radioactivity areas to verify barrier integrity and engineering controls performance (e.g., HEPA ventilation system operation) and to determine if there was a potential for individual worker internal exposures of greater than 50 millirem committed effective dose equivalent. No areas in the plant were airborne areas with a potential of greater than 5 millirem committed effective dose equivalent. Work areas having a history of, or the potential for, airborne transuranics were evaluated to verify that the licensee had considered the potential for transuranic isotopes and provided appropriate worker protection. The licensee has not had a history of transuranic contamination. These reviews represented one inspection sample.

The adequacy of the licensee's internal dose assessment process for internal exposures greater than 50 millirem committed effective dose equivalent was assessed. These reviews represented one inspection sample.

The inspectors also reviewed the licensee's physical and programmatic controls for highly activated and/or contaminated materials (non-fuel) stored within spent fuel or other storage pools. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, Licensee Event Reports, and Special Reports related to the access control program to verify that identified problems were entered into the corrective action program for resolution. These reviews represented one inspection sample.

The inspectors reviewed seven corrective action reports related to access controls and high radiation area radiological incidents when available (non-PIs identified by the licensee in high radiation areas greater than 1R/hr). Staff members were interviewed and corrective action documents were reviewed to verify that follow-up activities were being conducted in an effective and timely manner commensurate with their importance to safety and risk based on the following:

- 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 the corrective action system; and
- Implementation/consideration of risk significant operational experience feedback.

These reviews represented one inspection sample.

The inspectors evaluated the licensee's process for problem identification, characterization, and prioritization and verified that problems were entered into the corrective action program and resolved. For repetitive deficiencies and/or significant individual deficiencies in problem identification and resolution, the inspectors verified that the licensee's self-assessment activities were capable of identifying and addressing these deficiencies. These reviews represented one inspection sample.

The inspectors reviewed licensee documentation packages for all PI events occurring since the last inspection to determine if any of these PI events involved dose rates greater than 25 R/hr at 30 centimeters or greater than 500 R/hr at 1 meter. Barriers were evaluated for failure and to determine if there were any barriers left to prevent personnel access. 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), were evaluated to determine if there were any regulatory overexposures or if there was a substantial potential for an overexposure. There were no unintended exposures approaching 100 millirem. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Job-In-Progress Reviews

a. Inspection Scope

The inspectors observed the following two work activities that were being performed in radiation areas, airborne radioactivity areas, or high radiation areas that presented the greatest radiological risk to workers:

- Spent fuel pool re-rack project; and
- Phase separator resin transfer.

The inspectors reviewed radiological job requirements for these two activities including RWP requirements and work procedure requirements, and attended As-Low-As-Reasonably-Achievable (ALARA) job briefings. These reviews represented one inspection sample.

Job performance was observed with respect to these requirements to verify that radiological conditions in the work area were adequately communicated to workers through pre-job briefings and postings. The inspectors also verified the adequacy of radiological controls including required radiation and contamination surveys; radiation

protection job coverage; and contamination controls. These reviews represented one inspection sample.

Radiological work in high radiation work areas having significant dose rate gradients was reviewed to evaluate the application of dosimetry to effectively monitor exposure to personnel and to verify that licensee controls were adequate. These work areas involved areas where the dose rate gradients were severe (diving activities in the fuel pool re-rack project) which increased the necessity of providing multiple dosimeters. These reviews represented one-inspection sample.

b. Findings

No findings of significance were identified.

.5 High Risk Significant, High Dose Rate (HRA), and Very High Radiation Area Controls

a. Inspection Scope

The inspectors held discussions with the acting Radiation Protection Manager concerning high dose rate/high radiation area and very high radiation area controls and procedures, including procedural changes that had occurred since the last inspection, in order to verify that any procedure modifications did not substantially reduce the effectiveness and level of worker protection. These reviews represented one inspection sample.

The inspectors discussed with RP supervisors the controls that were in place for special areas that had the potential to become very high radiation areas during certain plant operations, 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. These reviews represented one inspection sample.

The inspectors conducted plant walkdowns to verify the posting and locking of entrances to high dose rate HRAs, and very high radiation. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.6 Radiation Worker Performance

a. Inspection Scope

During job performance observations, the inspectors evaluated radiation worker performance with respect to stated radiation protection work requirements and evaluated whether workers were aware of the significant radiological conditions in their workplace, the RWP controls and limits in place, and that their performance had accounted for the level of radiological hazards present. These reviews represented one inspection sample.

The inspectors reviewed radiological problem reports 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 the acting Radiation Protection Manager. These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.7 Radiation Protection Technician Proficiency

a. Inspection Scope

During job performance observations, the inspectors evaluated Radiation Protection Technician (RPT) performance with respect to radiation protection work requirements and evaluated whether they were aware of the radiological conditions in their workplace, the RWP controls and limits in place, and if their performance was consistent with their training and qualifications with respect to the radiological hazards and work activities. These reviews represented one inspection sample.

The inspectors reviewed radiological problem reports which found that the cause of the event was radiation protection 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.

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation (71122.02)

.1 Radioactive Waste System

a. Inspection Scope

The inspectors reviewed the liquid and solid radioactive waste system descriptions in the Updated Final Safety Analysis Report (UFSAR), and the 2006 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/self-assessment activities, with regard to radioactive material processing and transportation programs to determine if those activities satisfied the requirements of

10 CFR 20.1101(c) and the quality assurance audit requirements of Appendix G to 10 CFR Part 20 and of 10 CFR 71.137, as applicable.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.2 Radioactive Waste System Walkdowns

a. Inspection Scope

The inspectors walked down portions of the liquid and solid radwaste processing systems to verify that these systems were consistent with the descriptions in the UFSAR and in the Process Control Program and to assess the material condition and operability of those systems. The inspectors reviewed the status of radioactive waste process equipment that was not operational and/or was abandoned in place. The inspectors discussed with the licensee the administrative and/or physical controls preventing the inadvertent use of this equipment to ensure that the equipment would not contribute to an unmonitored release path or be a source of unnecessary personnel exposure.

The inspectors reviewed changes to the waste processing system to verify the changes were reviewed and documented in accordance with 10 CFR 50.59 and to assess the impact of the changes on radiation dose to members of the public. The inspectors reviewed the licensee's processes for transferring waste resin into shipping containers to determine if appropriate waste stream mixing and sampling was performed so as to obtain representative waste stream samples for analysis. The inspector 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 accordance with 10 CFR 61.55.

These reviews 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 methods and procedures for determining the classification of radioactive waste shipments including the use of scaling factors to quantify difficult-to-measure radionuclides. The inspectors reviewed the licensee's most recent radiochemical sample analysis results for each of the licensee's waste streams, and the associated calculations used to account for difficult-to-measure radionuclides. These waste streams consisted of radwaste demineralizer resins, various filter media, and dry active waste (DAW). 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 determine if reactor coolant chemistry data was periodically evaluated to account for changing operational parameters that could potentially affect waste stream classification and thus validate the continued use of existing scaling factors between sample analysis updates.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

.4 Shipment Preparation and Records

a. Inspection Scope

The inspectors reviewed the documentation of shipment packaging, surveying, package labeling and marking, vehicle inspections and placarding, emergency instructions, and licensee verification of shipment readiness for six selected non-excepted radioactive material and radwaste shipments, made between March 2006 and January 2007. The shipment documentation reviewed included:

- Equipment in a B-25 Box Shipped as Low Specific Activity (LSA);
- Two Spent Resins Shipped as Type A;
- Two Phase Separator Resins Shipped as Type A; and
- Part 61 Resin Samples Shipped as LSA.

For each shipment, the inspectors determined if the requirements of 10 CFR Parts 20 and 61 and those of the Department of Transportation (DOT) in 49 CFR Parts 170-189 were met. Specifically, records were reviewed, and staff involved in shipment activities were interviewed to determine if packages were labeled and marked properly, if packages and transport vehicle surveys were performed with appropriate instrumentation, whether survey results satisfied DOT requirements, and if the quantity and type of radionuclides in each shipment were determined accurately. The inspectors also determined whether shipment manifests were completed in accordance with DOT and NRC requirements, if they included the required emergency response information, if the recipient was authorized to receive the shipment, and if shipments were tracked as required by 10 CFR Part 20.

Selected staff involved in shipment activities were interviewed by the inspectors to determine if they had adequate skills to accomplish shipment related tasks and to determine if the shippers were knowledgeable of the applicable regulations to satisfy package preparation requirements for public transport with respect to NRC Bulletin 79-19, "Packaging of Low-Level Radioactive Waste for Transport and Burial." Also, the inspectors reviewed the transportation specific training for the authorized shippers to assure that they met the requirements of 49 CFR Part 172, Subpart H.

These reviews represented two inspection samples.

b. Findings

(1) Shipment Total Quantity Re-characterized After Shipping

A shipment of phase separator resins was shipped from Clinton Power Station September 30, 2005, and delivered to a vendor on October 1, 2005. The total curie quantity in the shipment was in excess of the vendor's Agreement State license limits. The vendor communicated this discrepancy to shipping personnel at Clinton Power Station on October 3, 2005. The shipper then re-characterized the total quantity of the shipment by reviewing dose rate survey data and applying a "dose to curie" methodology. Contrary to Clinton procedure, the re-characterization was not reviewed by other Clinton personnel and new paperwork for the shipment, including a new NRC Form 541 was generated and transferred to the recipient.

This event remains under review by the NRC and is categorized as an Unresolved Item (URI) (**URI 05000461/2007004-01**).

.5 Identification and Resolution of Problems for Radwaste Processing and Transportation

a. Inspection Scope

The inspectors reviewed selected condition reports, self-assessment and audit reports, along with field observation reports that addressed the radioactive waste and radioactive materials shipping program, since the last inspection to determine if the licensee had effectively implemented the corrective action program and if problems were identified, characterized, prioritized, and corrected. The inspectors also determined whether the licensee's self-assessment program was capable of identifying repetitive deficiencies, or significant individual deficiencies in problem identification and resolution.

The inspectors also selectively reviewed other corrective action program reports generated since the previous inspection that dealt with the radioactive material or radwaste shipping program, 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 tracked in corrective action system(s); and
- Implementation/consideration of risk significant operational experience feedback.

These reviews represented one inspection sample.

b. Findings

No findings of significance were identified.

4. **OTHER ACTIVITIES (OA)**

4OA1 Performance Indicator Verification (71151)

To perform a periodic review of performance indicator (PI) data to determine its accuracy and completeness.

Cornerstones: Mitigation Systems

1. Mitigating Systems Performance Indicators (MSPI)

a. Inspection Scope

The inspectors sampled the licensee's submittals for performance indicators for the period of July 2006 through June 2007. The inspectors used performance indicator definitions and guidance contained in revision 5 of Nuclear Energy Institute (NEI) document 99-02, "Regulatory Assessment Performance Indicator Guideline," to verify the accuracy of the performance indicator data. The inspectors performed three samples by reviewing the following:

- MSPI Emergency AC;
- MSPI Residual heat removal and
- MSPI Shutdown service water.

b. Issues and Findings

No findings of significance were identified.

2. Safety System Functional Failures Performance Indicator

a. Inspection Scope

The inspectors reviewed, at a minimum, the most recent 24 months of Licensee Event Reports, licensee data reported to the NRC, plant logs, issue reports, and NRC inspection reports to verify the following performance indicators reported by the licensee for the 2nd Quarter of 2007 for Safety System Functional Failures.

The inspectors verified that the licensee accurately reported performance as defined by the applicable revision of Nuclear Energy Institute Document 99-02, "Regulatory Assessment Performance Indicator Guideline."

This performance indicator review constituted one inspection sample.

b. Findings

No findings of significance were identified.

Cornerstones: Public Radiation Safety and Barrier Integrity

a. Inspection Scope

The inspectors reviewed the licensee's determination of PIs for the Public Radiation Safety Performance Indicator (Radiological Environmental Technical Specification/Offsite Dose Calculation Manual Radiological Effluent Occurrences) and Barrier Integrity Performance Indicator (Reactor Coolant System Specific Activity) to determine if the licensee accurately determined these performance indicators and had identified all occurrences. Specifically, the inspectors reviewed the licensee's corrective action program documents for the 4th quarter of CY 2006 and the 1st, 2nd, and 3rd quarters of CY 2007 and Public Radiation Safety and Barrier Integrity Performance Indicator data to ensure that there were no PI occurrences that were not identified by the licensee. In addition to record reviews, the inspectors observed a chemistry technician obtain and analyze a reactor coolant system sample. The inspectors interviewed members of the licensee's staff who were responsible for performance indicator data acquisition, verification and reporting, to determine if their review and assessment of the data was adequate.

These reviews represented two inspection samples.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems (71152)

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. In addition, the inspectors reviewed the following issue:

b. Findings

There were no findings of significance identified. The inspectors reviewed procedure OP-AA-102-103, "Operator Work-Around Program," and the issues being tracked for program resolution. As of July 23, 2007, there were two operator workarounds that were being tracked for resolution. The inspectors' review determined that the issues were appropriately characterized as operator workarounds.

The inspectors also reviewed selected operations department concerns and out of tolerance items that were identified in operations narrative logs to identify potential operator workarounds that were not in the program. The inspectors concluded that there were no additional workarounds identified from the sources reviewed.

On August 2, 2007, the inspector attended a WorkAround Board (WAB) meeting. One of the items under review that was identified during forced outage C1F049 and documented by IR 642141, was the operation of 1E12-F009, residual heat removal shutdown cooling inboard isolation valve, from the main control room. The valve would not open or close electrically (i.e., mechanically bound). An operator workaround program review was not requested by IR 642141. The resident inspectors questioned the licensee on the appropriateness of not conducting an operator workaround program review. This resulted in the August 2 review of this condition. In addition, the licensee generated IR 656515 on the missed opportunity to conduct an operator workaround program review of 1E12-F009 valve operation. On August 2, 2007, the WAB approved 1E12-F009 valve operation as an operator workaround. The WAB member dialogue on the issues that were reviewed on August 2, 2007, was at the appropriate level of detail, and considered operator compensatory actions required to comply with plant procedures, design requirements and technical specifications.

4OA3 Event Follow-up (71153)

- .1 (Closed) LER 05000461/2005-001-00. Inadequate Procurement Specification for Charcoal Results in Inoperable Control Room Ventilation Subsystem.

Introduction: A performance deficiency involving a Non-Cited Violation of 10 CFR Part 50, Appendix B, Criterion IV, "Procurement Document Control," was self revealed following receipt of results that showed that Division 1 control room ventilation (VC) system charcoal filter penetration values were higher than allowed by Clinton's Technical Specifications. This issue occurred because the licensee failed to establish proper purchase specifications for charcoal used in the VC system. Additionally, this issue led to Division 1 VC subsystems being inoperable from May 9 through May 16, 2005, concurrent with Division 2 VC subsystems being inoperable due to planned maintenance from May 9 through May 14, 2005.

Description: On May 4, 2005, the licensee took charcoal absorber samples from the Division 1 VC recirculation charcoal bed filter in order to perform charcoal penetration testing as required by VC system Technical Specification surveillance requirement 3.7.3.3. On May 9, 2005, planned maintenance was performed on the Division 2 emergency diesel generator resulting in it becoming inoperable. The licensee also declared the Division 2 VC subsystem inoperable because of the diesel inoperability. The Division 2 emergency diesel generator and the Division 2 VC system were declared operable on May 14, 2005, following completion of planned maintenance on the emergency diesel generator. On May 16, 2005, the licensee received the Division 1 charcoal sample analysis results which showed that after applying a correction factor, the charcoal penetration value was 8.168. This charcoal penetration was higher than the charcoal penetration operability value of 6.0 contained in Clinton's Technical Specifications.

Because of the unsatisfactory results, the licensee concluded that the seven day required action completion time to restore an inoperable VC subsystem was not met, nor was the required action to be in Mode 3 and Mode 4 per Clinton's Technical Specifications. Additionally, the Division 2 VC subsystem was inoperable from May 9 to May 14, 2005, due to the Division 2 emergency diesel generator maintenance outage. The licensee concluded that the station was in Technical Specification (TS) 3.7.3 required action D.1, requiring entry into TS limiting condition for operation (LCO) 3.0.3. The licensee did not enter the TS 3.7.3 required action and LCO 3.0.3, since the sample results were not known during the emergency diesel generator outage.

A licensee investigation concluded that the cause of this event was that charcoal purchasing requirements were inadequate for the unique application at Clinton. The licensee purchased the charcoal installed in the Division 1 VC system to ANSI/ASME N509-1980, "Nuclear Power Plant Air Cleaning Units and Components." According to the licensee, this industry standard had no limit on as-manufactured moisture levels. The licensee concluded that the Clinton VC system's unique design attributes, which included higher than normal airflow velocity, thin charcoal beds, and no airflow heaters coupled with high as-manufactured moisture levels significantly reduced the charcoal residence time and increased the penetration levels. The licensee investigation also concluded that 10 percent of the charcoal contained in the failed filter was caked after 17 months of operations. The licensee stated that this caking was again proof of high as-manufactured moisture content.

The failed charcoal bed filter contained coal from lot 55, batch 68. The licensee's extent of condition review determined that this event was limited to the VC 'A' recirculation charcoal bed filter. The bases of this conclusion were that penetration tests results were satisfactory for the other beds in the VC system and no lot 55, batch 68, charcoal was in storage. The licensee investigation also determined that the charcoal in lot 55, batch 68, had as-manufactured high moisture content of at least 12 percent by weight. All charcoal currently in storage was confirmed to have a moisture content of less than eight percent.

The inspectors were concerned that the licensee maintenance scheduling process would allow for the redundant VC subsystem to be made inoperable without knowing the results of the Technical Specification required sample analysis. The inspectors concluded poor scheduling of work contributed to both VC subsystems becoming inoperable per the licensee's Technical Specifications. The licensee did not address this issue in the root cause report. In response to the inspectors' questions in this area, the licensee provided issue report 340314, "Enhancement to Manage Risk of Charcoal Samples." This issue report addressed the inspectors' concern, in that, it incorporated corrective actions that implemented an administrative trigger using model work orders to ensure that no work would be scheduled for the next work week that would cause an inoperability of the opposite train or its support systems. This administrative trigger was placed into model work orders for all VC system and standby gas treatment system predefined activities.

Analysis: The inspectors determined that the licensee's failure to provide adequate purchase specifications to satisfy the requirements for the Clinton unique VC system

was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, because the finding affected the objective of the Barrier Integrity cornerstone of assuring that physical design barriers protect the public from radionuclide releases caused by accidents or events. Additionally, this issue is associated with the barrier performance attribute of maintaining Radiological Barrier functionality of the control room. Failure to ensure adequate purchase specifications resulted in there being a period where both trains of control room ventilation were inoperable without the knowledge of the operators.

The inspectors completed a Phase 1 significance determination using IMC 0609, "Significance Determination Process," Appendix A, Attachment 1, dated March 23, 2007. Using IMC 0609 Appendix A, SDP Phase 1 screening worksheet, the inspectors determined that this issue degraded the Containment Barrier. The inspectors answered 'Yes,' to whether the finding only represents a degradation of the radiological barrier function provided for the control room, or auxiliary building, or spent fuel pool, or SBT system (BWR). As a result, the Phase 1 Worksheets screened as Green.

The finding is also related to the cross-cutting area of Human Performance as defined in IMC 0305, "Operating Reactor Assessment Program," specifically, the finding is related to the resources and work control component because the licensee did not provide an adequate purchase specification reflective of the requirements for the VC system. However, this issue was determined not to have a cross-cutting aspect because it was over two years old and not reflective of current performance in this area based on the inspector's review of the licensee's effectiveness review of corrective actions established to prevent this issue from occurring again.

Enforcement: 10 CFR Part 50, Appendix B, Criteria IV, "Procurement Document Control" states that measures shall be established to assure that applicable regulatory requirements, design bases, and other requirements which are necessary to assure adequate quality are suitably included or referenced in the documents for procurement of material, equipment, and services, whether purchased by the applicant or by its contractors or subcontractors.

Contrary to the above, Clinton Power Station failed to specify in a procurement document the moisture content for charcoal filters to be used in the VC system. This issue resulted in charcoal being used in the division 1 VC system that was outside the penetration limits established by Technical Specification 3.7.3, from May 4 to May 16, 2007. This issue also resulted in both control room ventilation systems being inoperable. The licensee entered this issue into the corrective action program (CAP) as issue reports 335698 and 340314. Corrective action for this issue included revising the charcoal purchase specifications to limit as-manufactured content of eight percent by weight. Additionally, the licensee added limitations to model work orders to prevent or limit the scheduling of work that could impact the operability of redundant systems that contained charcoal. Because the licensee entered the issue into the CAP and the finding is of very low safety significance, this violation is being treated as an NCV,

consistent with Section VI.A of the NRC Enforcement policy.
(NCV 05000451/2007-004-01)

.2 (Closed) LER 05000461/2007-003-00, IGSCC Causes RCS Pressure Boundary Leak and Reactor Shutdown

a. Inspection Scope

The inspectors observed the station response to a steam leak in the drywell on June 18, 2007. The inspectors arrived in the control room approximately two hours after the initial alarms and indications of a leak were received and discussed the actions that had been taken with control room operators. The inspectors then proceeded to the outage control center, which had been manned for troubleshooting and to support the control room in decision making, to discuss proposed actions with licensee management. The inspectors reviewed the licensee's troubleshooting documents, equipment prompt investigation, root cause report, and LER 2007-003.

b. Findings

Introduction: A Non-Cited Violation of Technical Specifications (TS) having very low safety significance (Green), was self-revealed when the licensee failed to meet the required completion time for an action statement in TS 3.4.5. Specifically, TS 3.4.5 does not allow reactor coolant system pressure boundary leakage and requires a shutdown to Mode 3 within 12 hours if pressure boundary leakage is discovered. Upon entry into the drywell following a shutdown of the reactor on June 19, 2007, the licensee discovered the existence of reactor coolant system (RCS) pressure boundary leakage. Indications of the leakage had been discovered at 0433 on June 18, 2007, but the plant was not placed in Mode 3 until approximately 31 hours later at 1125 on June 19, 2007.

Description: At 0433 on June 18, 2007, plant operators responded to main control room alarms and other indications, and determined the presence of a steam leak in the drywell. The initial alarms included: Transient Test Alarm, Fission Product Particulate High Radiation, and Fission Product Iodine High. Other indications included transient test system trouble, channel 119, main steam line 'C' elbow tap differential pressure, an increased trend in drywell pressure rise, and the fission product monitor particulate and iodine channels had taken a step change. The operators took appropriate actions in accordance with station procedures for reactor coolant leakage and abnormal release of airborne radioactivity. The operators noted that a spike in main steam line 'C' elbow tap differential pressure was an indication of a steam leak somewhere in the area of the elbow tap. The 'C' main steam line elbow taps were located within the area considered reactor coolant system pressure boundary. The operators entered TS 3.4.5 actions C.1, be in Mode 3 in 12 hours, and C.2, be in Mode 4 in 36 hours.

The licensee manned the outage control center at 0641. After further deliberations, the licensee noted that there were other components (mechanical joints for flexi-hose) that are associated with the 'C' main steam line flow instrumentation that are not considered pressure boundaries and, therefore, the increase in drywall leakage was not

necessarily pressure boundary leakage. Based on this, the licensee then decided to consider the steam leak as unidentified leakage. With the change in classification to unidentified leakage the leak rates did not meet any of the requirements for remaining in TS 3.4.5. The licensee exited action statements C.1 and C.2. However, although small, the leakage continued to increase. Due to the steady increase in unidentified leakage, operators commenced a normal plant shutdown at 2011 on June 18, 2007, to enter the drywell and identify the actual location of the steam leak. At 0635 on June 19, 2007, maintenance personnel entered the drywell and found pressure boundary leakage on a one-inch diameter ASME Section III Class II stainless steel braided flexible hose assembly on the "C" main steam line flow elbow tap. Operators once again entered the actions of TS 3.4.5 due to reactor coolant pressure boundary leakage. The plant entered Mode 3 at 1125 on June 19, 2007, (approximately 31 hours after indication of pressure boundary leakage), and Mode 4 at 2300 on June 19, 2007. The licensee replaced the leaking flexible hose and initiated a root cause investigation. The root cause determined that the leak was caused by intergranular stress corrosion cracking of the flexible hose.

Analysis: The inspectors determined that failure to meet the required completion times for TS actions was a performance deficiency warranting a significance evaluation. The inspectors determined that the finding was more than minor by using Inspection Manual Chapter 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Screening," because operating with a degraded pressure boundary affected the reactor coolant system (RCS) equipment and barrier performance attribute of the Barrier Integrity cornerstone, in that, RCS pressure boundary leakage results in a reduction in the reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding also affected the cross-cutting component of Decision Making in the area of Human Performance in that operators had initially entered TS 3.4.5 for pressure boundary leakage, but subsequently, the organization decided not to treat the leak as pressure boundary leakage, but rather as unidentified leakage until the actual location could be determined.

The inspectors completed a significance determination using IMC 0609, "Significance Determination Process." The Phase 1 worksheet directed the inspectors to consider the reactor coolant system leakage under the Initiating Events Cornerstone column. The inspectors answered 'Yes' to question one under the Initiating Events cornerstone column stating that assuming worst case degradation, the finding would result in exceeding the TS limit for identified RCS leakage. The Phase 1 worksheet directed the inspector to Phase II. For the Phase II screening, the inspectors used the table for a small break loss of coolant accident, and conservatively set the initiating event frequency to 1 ($X=0$), because the event was actually occurring in the form of the steam leak. Since all of the mitigating equipment was available, the finding was determined to be of very low safety significance (Green). The licensee established the following corrective actions to address this issue: 1) replaced the leaking flexible hose, 2) scheduled replacement of all other flexible hoses used on the main steam lines during the next refueling outage and 3) established a 16-year preventive maintenance replacement frequency for the flexible hoses used on the main steam line.

Enforcement: Technical Specification 3.4.5 a. limits RCS operational leakage to "No pressure boundary leakage," and states that if pressure boundary leakage is

present, the plant is required to be in Mode 3 in 12 hours and Mode 4 in 36 hours. Contrary to the above, on June 18, 2007, pressure boundary leakage was present and the operators did not place the plant in Mode 3 for nearly 31 hours and Mode 4 for approximately 42 hours. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as IR 641375, this violation was treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy. The LER is closed. **(NCV 05000461/2007004-02)**

.3 Spent Fuel Bundle Incident During Rerack Project

Introduction: A performance deficiency involving a Non-Cited Violation of 10 CFR Part 50 Appendix B, Criteria V, "Instructions, Procedures, and Drawings," was self-revealed following an event on August 17, 2007, where a spent fuel bundle being moved to a temporary storage location came in contact with and rested upon another fuel bundle seated in its storage location. The licensee procedure that governs spent fuel pool movement failed to provide adequate guidance on how high to lift the fuel bundle prior to traversing across the spent fuel pool.

Description: During spent fuel moves on August 17, 2007, in support of the spent fuel pool re-rack project, a spent fuel bundle being moved by a spent fuel bridge operator came in contact with the bail handle of a spent fuel bundle seated in its storage location. Upon recognition of this situation the spent fuel bridge operator immediately stopped. Immediately following the stoppage of the spent fuel bridge the licensee observed that the fuel bundle was leaning slightly and the grapple-engaged light was no longer lit. The grapple-engage light being no longer lit was an indication that the grapple switch was no longer engaged and that an interlock was in place that prevented the fuel bundle from being lifted vertically. Prior to resuming fuel movement, the licensee verified that the grapple was indeed engaged by use of an underwater camera. After this verification, the interlock associated with the grapple-engage light was bypassed. The spent fuel bundle was then raised and placed back in its original location.

A situation where a fuel bundle comes in contact with and rests upon another fuel bundle is a concern because it challenges the integrity of the fuel cladding. The fuel cladding is considered one of three physical barriers designed to separate the fuel from the public and the environment.

Upon review of procedure CPS 3703.02, "Fuel Handling Platform Operations," the inspectors concluded that the procedure failed to provide adequate guidance on how high the bundle should be lifted prior to moving the bundle to a new location. This procedure was the administrative procedure which governs the operation of the bridge and is used by the bridge operators to perform spent fuel pool movement. For example step 8.2.2.15 requires lifting the bundle or blade until the grapple "normal up" light is lit if moving the fuel bundle into the inclined fuel transfer system upender. The "normal up" indication occurs at a reference vertical position ("Z" coordinate) of 0 inches. As the fuel bundle is lowered from the normal up position, the "Z" coordinate increases. Appendix A of the CPS 3703.02, showed several minimum fuel grapple "Z" coordinates

for various movements. The appendix showed that the fuel bundle must be at or above 'Z' position of 66 inches to enter the spent fuel pool racks.

The inspectors noted that a caution prior to step 8.2.2.15 states, "it is not required to raise the main hoist to normal up prior to platform or trolley movement, however adequate clearance shall exist." The inspectors concluded that this step does not contain adequate guidance on how high to lift the fuel bundle prior to moving it to another location in the spent fuel pool. The inspectors concluded that the lack of specific guidance caused this event to occur. Additionally, the procedure did not require any form of verification or peer checks prior to fuel movement.

Analysis: The inspectors determined that the licensee's failure to provide adequate details in the procedure was a performance deficiency warranting a significance evaluation. The inspectors concluded that the finding was more than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, because the finding affects the barrier integrity objective of assuring that physical design barriers protect the public from radionuclide releases caused by accidents or events. The finding is associated with the procedure quality attribute of the Barrier Integrity cornerstone because it challenged the functionality of the fuel cladding.

The inspectors completed a Phase 1 significance determination using IMC 0609, "Significance Determination Process," Appendix A, Attachment 1, dated March 23, 2007. Using IMC 0609 Appendix A, SDP Phase 1 screening worksheet, the inspectors determined that this issue degraded only the Fuel Cladding Barrier and its associated cornerstone. Therefore, in accordance with the screening worksheet, this issue screens directly as Green. This finding is related to a cross-cutting component in the area of Human Performance associated with Resources (H.2(c)) because the licensee did not provide complete and accurate procedures. Specifically, the procedure relied on the skill of the operator and did not require independent verification.

Enforcement: 10 CFR Part 50, Appendix B, Criteria V, "Instructions, Procedures, and Drawings" states that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, Clinton Power Station (CPS) procedure 3703.02 failed to provide adequate instructions for handling spent fuel bundles. This resulted in a spent fuel bundle that was being moved to a temporary storage location coming in contact with another fuel bundle seated in its storage location on August 17, 2007. This issue was entered into the licensee's corrective action program as issue report 661918. Corrective action included revising the fuel handling procedure. Because this violation was of very low safety significance and was entered into the licensee's CA program, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy. **(NCV 05000451/2007-004-03)**

4OA4 Cross-Cutting Aspects of Findings

- .1 A finding described in section 4OA3.2 of this report had, as its primary cause, a Human Performance deficiency, in that, licensee decision making in determining the source of a steam leak in the drywell resulted in exceeding the TS allowed time for placing the plant in Modes 3 and 4 when RCS pressure boundary leakage was present.
- .2 A finding described in section 4OA3.3 of this report had, as its primary cause, a Human Performance deficiency, in that, the licensee failed to provide adequate procedural guidance in regard to moving spent fuel in the spent fuel pool.

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 4, 2007. 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 exit meetings were conducted for:

- Occupational Radiation Safety program for radiation monitoring instrumentation and protective equipment with Mr. F. Kearney, Plant Manager on August 10, 2007.
- Radioactive Material Processing and Transportation program with Mr. B. Hanson on September 21, 2007.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

B. Hanson, Site Vice President
R. Kearney, Plant Manager
R. Schenck, Work Management Director
G. Vickers, Radiation Protection Director
J. Gackstetter, Regulatory Assurance Manager
R. Frantz, Regulatory Assurance Representative
M. Hiter, Access Control Supervisor
M. Friedmann, Acting Regulatory Assurance Director
C. VanDerburgh, Nuclear Oversight Manager
J. Domitrovich, Maintenance Director
D. Schavey, Operations Director
J. Rappeport, Acting Chemistry Manager
J. Lindsay, Training Manager
C. Williamson, Security Manager
R. Peak, Site Engineering Director
T. Chalmers, Shift Operations Superintendent

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000461/2007004-01	URI	Shipment Total Quantity Re-characterized After Shipping (Section 2PS2.3)
05000451/2007-004-01	NCV	Inadequate Procurement Specification for Charcoal Results in Inoperable Control Room Ventilation Subsystem
05000451/2007-004-02	NCV	Failure to Comply with Technical Specification 3.4.5 for RCS Pressure Boundary Leak
05000451/2007-004-03	NCV	Inadequate Procedure Results in Spent Fuel Bundle Incident

Closed

05000461/2007-003-00	LER	IGSCC Causes RCS Pressure Boundary Leak and Reactor Shutdown
05000461/2005-001-00	LER	Inadequate Procurement Specification for Charcoal Results in Inoperable Control Room Ventilation Subsystem

05000451/2007-004-01	NCV	Inadequate Procurement Specification for Charcoal Results in Inoperable Control Room Ventilation Subsystem
05000451/2007-004-02	NCV	Failure to Comply with Technical Specification 3.4.5 for RCS Pressure Boundary Leak
05000451/2007-004-03	NCV	Inadequate Procedure Results in Spent Fuel Bundle Incident

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.

1R01 Adverse Weather

OP-AA-108-111-1001, Severe Weather and Natural Disaster Guidelines; Revision 2
OP-AA-102-102, General Area Checks and Operator Field Rounds; Revision 5
WC-AA-107, Seasonal Readiness; Revision 3
CPS 1019.05, Transient Equipment/Materials; Revision 11
CPS 4302.01, Tornado/High Winds; Revision 18e

1R04 Equipment Alignments

CPS 3319.01V001, Standby Gas Treatment Valve Lineup; Revision 8
CPS 3319.01E001, Standby Gas Treatment Electrical Lineup; Revision 10c

1R05 Fire Protection

CPS 1893.04M310, 719 Control: HVAC Equipment Area Pre-fire Plan; Revision 5a
Section 3.2.1.2, "Fire Area A-2: Zone A-2a", Fire Protection Evaluation Report,
CPS 1893.01, Fire Protection Impairment Reporting, Revision 16a
CPS Updated Final Safety Analysis Report, Fire Hazard Analysis
CPS 1892.01, Fire Protection Impairment Reporting, 08/02/07, Revision 16b.
Section 6.2.6.3, Updated Safety Analysis Report
ANSI 56.8, 1987, Containment System Leakage Testing Requirements
Reg. Guide 1.163, Performance Based Containment Leak - Test Program
10 CFR 50 App. J., Primary Reactor Containment Leakage Testing for Water - Cooled Power Reactors
CPS - ITS
CPS Risk Evaluation #1631, Risk Analysis for Missed Surveillance, failure to complete LLRT on Containment Monitoring Test Lines
IR 660299, Type C Testing for LLRT Test Lines

1R06 Flood Protection

CPS 4304.01, "Flooding," Revision 4e
IR 670686, "Setpoints For Maximum Normal Operating Water Level Switches"
IR 670693, "Flood Water Level & Secondary Containment Temperature Instrumentation"
IR 670429, "Max Safe Flood Alarm Out of Cal in RH [residual heat removal] A Room"
IR 670415, "Max Safe Flood Alarms Out of Cal in RI Pump Room"

1R07 Heat Sink Performance

WO 1005225, Open, Inspect, Boroscope, Eddy Current 100%, and Clean 1DG13A
ER-AA-340-1002, Service water heat exchanger and component inspection guide; Revision 3
IR 678934, Division three diesel generator heat exchanger chemistry results; October 2, 2007
IR 675035, Diesel generator jacket water cooler zinc modification execution impact; September 24, 2007

IR 675091, Excessive erosion discovered on the flange faces of 1VH03A; September 25, 2007
WO 01005225, Open, Inspect, Boroscope, Eddy Current 100%, and Clean
AR 00678934, Division II Diesel Generator HX (1DG13A) Chemistry Results
AR 00675035, Diesel Generator Jacket Water Cooler Zinc Mod Execution Impact
ER-AA-340-1002, Service Water Heat Exchanger and Component Inspection Guide,
Revision 3

1R12 Maintenance Effectiveness

IR 518197, "NOS ID MSPI Basis Document Requires Revision"
IR 519897, "Potential Air Leak on 1VQ002 or 1VQ005"
IR 520828, "CPS 4001.02C001 Setpoint Update Needed"
IR 524365, "Automatic Reactor Scram on Reactor High Water Level"
IR 524768, "RCIC Isolation Troubleshooting Results"
IR 552156, "Condition Monitoring Failure – LD Inst 1E31N085A – RCIC Isolation"
IR 550868, "1SX01PA: Low Margin for Division I SX Design Flows"
IR 548493, "1C91P633: STS Failure, 5004-3H, RCIC Division 1 Card C-A14-A125"
IR 530970, "Invalid Assumption in Calculation"
IR 556556, "Unexpected Annunciators during STS Summary Card B-A11-A111"
IR 557804, "Evaluate Transmitter 1E31N085B Time Delay Settings"
IR 557809, "Received Annunciator 5004-3H, STS Failure"
IR 648094, "1E51-F054 RCIC Drain Pot Bypass Valve has Small Packing Leak"
IR 639727, "RCIC Pump Outboard Bearing Bubbler Crosshairs not @ 90 Degrees"
IR 631320, "NRC Question: Impact of EC 365827 Changes on Close Time Test"
IR 589210, "RCIC Speed > 4600 RPM during Surveillance Testing"
IR 589461, "Found RCIC Turbine & Governor Oil Below the Standby Band"
IR 627033, "1E51-N590: New RGSC Card Cat ID 1148300-01 Failed Testing"
IR 587482, "1E51F046 Potential MOV Over Thrust Risk"
IR 584757, "1E51N590: RCIC RGSC Module Replacement & Procedure Enhance"
IR 562400, "1 Foot Steam Plum Leak at Base of 1E51N010"
IR 555469, "1E51N010: 5063-2C Turbine Stm Line Wtr Drain Trap Level High"
IR 555312, "Crack Found in Housing for Level Switch during WO 924362"
IR 535878, "Minor Steam Leak under Insulation of RCIC Turbine 1E51-C002"
IR 531654, "RCIC Quick Start Surv CPS 9054.01C004"
IR 531065, "RCIC Turbine Stayed at Incorrect Speed during 9054.01C004"
IR 529655, "NOS ID'D RCIC Restoration with out of Cal Pressure Transm"
IR 528901, "IMD Lessons Learned form 1E31N085A Replacement"
IR 524345, "RCIC Division 1 Isolated Following Scram"
IR 517311, "Revise ARP's 5062-3D & 5063-2E and 3310.01"
IR 517453, "New Fittings for RCIC Vortex Mod does not Match Design"
IR 517558, "Mini-PM for RCIC Turbine 1E51-C002 – C1R11"
IR 517768, "Feasibility Study for RPV Head Piping"
IR 517775, "Security Required for RCIC Tank Control Sooner than Planned"
IR 517874, "TS 3.3.3.2, Remote Shutdown Instrumentation, Enhancement"
IR 518522, "E51-N655F Failed Initial +/- .25% Input/Output Comparison"
IR 518849, "Heater Support Stands not secured to Tank"
IR 518932, "Free Release of Transmitters"
IR 519207, "Transposition Error for RPM Values – RCIC Turbine Speed"
IR 519208, "1TR-CM018 Points above Alarm Setpoint with no Alarm Leds Lit"
IR 519566, "Items Discovered on Carts not Properly RAM Tagged/Controlled"

IR 519776, "Red Hose Found by RCIC Tank"
IR 520032, "NOS ID - Unavailability Baseline Data Errors in MSPI Basis Doc"
IR 520069, "Work Week Preps Did Not Identify Issues"
IR 520293, "NRC Question on MSPI Implementation"
IR 520803, "Contamination Found on Floor in RCIC Tank Valve Room"
IR 520906, "TS LCO 3.3.5.1/3.3.5.2 Logical Connections Need Indenting"
IR 522049, "NSRB Issue – Unsecured Cables at Contaminated Area Boundary"
IR 522119, "NOS ID – Deficiencies Found During NSRB Tour"
IR 523330, "NRC Identified MSPI Basis Document Error for HP"
IR 524547, "Possible Training Process Problem"
IR 524893, "Poor Decision Making in PORC Meeting"
IR 525078, "Actions Required RCIC High Steam Flow Time Delay EC 362261"
IR 526991, "Correction Needed for IR 518932 Response"
IR 528013, "New Card Received Damaged from Stores"
IR 528655, "NOS ID Line Not Properly Controlled"
IR 528787, "RP Work Practices Need Improvement"
IR 529288, "Enhancements to RCIC Restoration Procedure"
IR 529423, "NOS ID Technical Rigor Weakness for RCIC OpEval 524768-02"
IR 529475, "Revise Tornado Missile Hazard Analysis"
IR 529411, "Change to 9054.01C004, RCIC Quick Start Surveillance"
IR 529718, "Process Improvements in Status Control"
IR 531090, "Enhancements: Clarify Tech Spec Bases for LCO 3.5.3 "RCIC""
IR 531215, "RCIC Procedure Lacks Steam Line Draining Steps"
IR 531392, "Ramp Generator Card Received with Jumper not used at CPS"
IR 531410, "FLS Provided Inaccurate Estimate for First Time Performance"
IR 531412, "RCIC Ramp Generator Card in Repair Program"
IR 537945, "Support for Estimating Flows for Mitigating Strategies"
IR 539389, "Trng: Simulator: Simulator Responses to Evaluated Scenario"
IR 541955, "RCIC Isolations Incorrectly Referenced in CPS 9532.16"
IR 543371, "Potential Trend in Equipment Failure Cause Identification"
IR 543520, "Evaluate Common Causes of RCIC System Issues"
IR 543638, "NOS-ID Appropriate Cause Evaluation not Assigned"
IR 543661, "Enhancement IR to Revise 9080.23"
IR 546682, "Trng: Drawing Reference is Incorrect"
IR 553475, "1LL59BP18E: Electrolyte Level below Plates on Two Cells"
IR 554669, "B.5.B Phase 2 and 3 Closure Actions"
IR 555735, "Expectation not Met as Required by CPS Policy #54"
IR 556474, "Ownership of 3209.01 Raw Water Treatment"
IR 557274, "E-2 Ready to Work Exceptions not in Goal for WW645"
IR 557833, "RCIC Vent Pipe Leaks at Sampling Point with Sample Equipment"
IR 558269, "Fix RCIC Sampling"
IR 559377, "NOS ID Separation Criteria not Maintained During EC Install"
IR 560786, "NOS ID'd Gaps in Technical Rigor Used in OP Determinations"
IR 561779, "9030.01C034 & C035 Missing an Expected Alarm"
IR 562215, "Security Tour Improvement Opportunities"
IR 562813, "Procedural Conflict for RCIC Instrument Valve Position"
IR 563344, "1E51F378 has Minor Packing Leak"
IR 563348, "Minor Oil Leaks on Oil Sightglass & Governor Assembly"
IR 563632, "Replace LD Transmitters to Prevent RCIC Isolation"

IR 563745, "Generate WO for LD Transmitter in Relation to CR-563632"
IR 565444, "NRC Non-Cited Violation 2006-11-02, RCIC Suction Vortexing"
IR 567532, "RCIC Valve 1E51-337 with Lockwire"
IR 569112, "ORM NTSP Value Incorrect for RCIC Storage Tank Level Low"
IR 570095, "NOS ID Project Plan for PI&R Inspection not Developed"
IR 570783, "Cause Analysis for HPCS Vortex Issue"
IR 574514, "Inappropriate Assignment of Corrective Actions"
IR 579912, "C1R11 Surv Opt HIT – 9438.05 Enhancements"
IR 582944, "Non-Oily Sheen on Top of Suppression Pool"
IR 583348, "Clean Up of Cask Wash Down Pit"
IR 585490, "Black Marker Found Floating in Suppression Pool"
IR 588801, "Procedure Enhancement to 9030.01C34"
IR 588802, "Procedure Enhancement to 9030.01C035 RI MS Sup Press"
IR 588886, "Enhance to 9054.02"
IR 589228, "1RI01T: Notice of Violation (White Finding) Related to HPCS"
IR 590313, "Division 1 ADS Backup Air Bottles Losing 25-50 # per Day"
IR 596320, "Perform ISI/NDE and Provide Support Work Pre C1R11"
IR 597183, "Trng – Revision Needed to Operations Strategies Document"
IR 599370, "Install Walkway across Berm at the RCIC Tank"
IR 599388, "Install Sidewalk to RCIC Tank"
IR 599404, "Install Gate on Existing Walkway"
IR 599942, "Procedure Review/Enhancement for Remote Shutdown Actions"
IR 599989, "RCIC TTV Gimpel Valve Discontinuation Future Material"
IR 600927, "RCR Identifies Weakness in OP-AA-108-115/OP-AA-106-1006"
IR 600993, "INPO CDE Website, MSPI PRA Data"
IR 603347, "NOS ID Post August 2006 Organization Weakness not Addressed"
IR 603659, "NOS ID Inadequate Appl of Standards during Work Activities"
IR 604716, "1E51-N636A as Found DAC Values OOT"
IR 608092, "Trng – Changes to Transient Mitigation Needed"
IR 608292, "2007 NRC PI&R Observation on Use of OPEX"
IR 610762, "Work Orders Removed from Week 0719 Parts"
IR 610943, "PMRQ for RV 1E12-F036 Specifies Incorrect Testing and Freque"
IR 613782, "9027.01C007 Section 8.7.7 Challenges SX Loads"
IR 613800, "Work Orders Removed from Week 0719"
IR 615740, "NOS ID Stated Apparent Cause was not addressed in EOC"
IR 617461, "RCIC Isolation Bypass Switch Operations in not Crisp"
IR 618123, "E-4 Clearance Indicator not at Goal of 100%"
IR 602553, "RCIC Transmitters not Available for SOW"
IR 602760, "Perform Inspection of Component Supports and Support"
IR 602867, "Procedure Enhancement for Filling RCIC Storage Tank"
IR 618251, "Fuse Missing form Interlock for Doors 329 and 330"
IR 618423, "Trng – Enhancement to 3310.01 RCIC"
IR 619749, "Tornado Missile Found in the RCIC Berm"
IR 621632, "NOS ID Trend Codes for CAP Products not Consistency Entered"
IR 622636, "Enhancement to ECCS Availability Due to WL Pump Availability"
IR 622674, "Missed Opportunity: Late Cancellation of a Work Order"
IR 623199, "RAT SVC Tripped Resulting in Unplnd Entry into 72 hr SD LCO"
IR 623608, "RCIC System Outage Questions"
IR 623611, "CDBI FASA " Configured Design Specification not Updated"

IR 624129, "Use of Admin Controls during RCIC Surveillance"
IR 624937, "WO 19406 Removed from Week 0719 due to Parts"
IR 625517, "MSPI Related Work Windows are not Consistently Scheduled"
IR 626291, "A TDRFP Oil Leak at 1PSFW105"
IR 626496, "RHR Unprojected Unavailability SSPI/MSPI Impact"
IR 626577, "Clearance Program Tag Font Remains Ambiguous/Unclear"
IR 626578, "Safety – Cannot Access Scaffold #5465 Safely"
IR 627067, "1C88N2403: TT Point 30 Failed Calibration"
IR 627527, "1E51N003: Computer Point E51DA001 Out of Spec Low (OOT)"
IR 627710, "Enhancement to ARP 5063-2D"
IR 628094, "1C88K607: Received Spurious Trip of TTHMI Server Channel 119"
IR 628259, "CDBI FASA Enhancement to Loss of AC Off Normal 4200.01"
IR 629191, "CDBI FASA – Check Valve 1E22-F016 Not in ATLAS"
IR 630647, "1RIX-AR013 Alert Alarm due to Spike"
IR 632033, "PMS Requires Valve Cycling in D/W and STM Tunnel"
IR 632043, "LL on LLRT Type C Test"
IR 632321, "Enhancement to CPS 3315.02, Leak Detection (LD)"
IR 632785, "CDBI FASA: Leakage to RCIC Tank not Updated in Alt. ST Docs"
IR 634385, "Placement of Red/Green Dots in the MCR"
IR 634633, "INPO Walk Downs List of Discrepancies"
IR 635283, "1VX14S Air Gap Between Housing and Cooling Coils 1VX14AA/AB"
IR 636156, "NRC Performance Indicator for SSFFS in Action Region"
IR 636753, "Chemistry Sample Results for 1VY04A RCIC Room Cooler"
IR 636859, "9030.01C007 Enhancement"
IR 637549, "Trng – Procedure Enhancement 3310.01 RCIC"
IR 638917, "1C71S001C: Unexpected Alarms Division 3 NSPS Inverter"
IR 641088, "No Engineered Test Points for Jumper/Test Leads in 9532.13"
IR 644916, "Set Test Condition for RI Min Flow Valve Therm. Overl. Test"
IR 647267, "1C91P633: Received 5004-3H STS Failure"
IR 648508, "3220.01 Requires Revision to Support C1R11"
IR 649191, "Procedure Step Needs Revision Regarding Bypass Switch"
IR 652248, "CAPR not Implemented as Worded"
IR 654201, "NOS ID: Trending of PAR Data for Common Causes"
IR 616603, "1E51N052: Unexpected MCR Alarm During 9054.06"
IR 654764, "NRC Questions RCIC Turbine Inboard Bearing Oil Level"
IR 627562, "1E51F064: Abnormal Voltage Indicated During Surveillance"
IR 627546, "9861.02D015 Test Set A had Leakage in Excess of 20,000 SCCM"
ER-AA-310, "Implementation of the Maintenance Rule," Revision 6
ER-AA-310-1001, "Maintenance Rule – Scoping," Revision 3
ER-AA-310-1002, "Maintenance Rule – SSC Risk Significance Determination," Revision 2
ER-AA-310-1003, "Maintenance Rule – Performance Criteria Selection," Revision 3
ER-AA-310-1004, "Maintenance Rule – Performance Monitoring," Revision 5
ER-AA-310-1005, "Maintenance Rule – Dispositioning Between (a) (1) and (a) (2)," Revision 5
ER-AA-310-1006, "Maintenance Rule – Expert Panel Roles and Responsibilities," Revision 3
ER-AA-310-1007, "Maintenance Rule – Periodic (a) (3) Assessment," Revision 4
Performance Criteria Report for RI System
Failure Report for RI System
Scoping/Risk Significance Detailed Report for RI System

Assessment of Maintenance Effectiveness; 10CFR50.65 (a) (3) Assessment; Clinton Power Station; 3/1/2004 to 3/1/2006.

CPS Technical Specifications: TS 3.8.4, 3.8.5, and 3.8.6 and associated bases
USAR Section 8.3.2

Vendor Manual K2989-0001, Power Conversion Products Battery Chargers

IR 546815, Division 2 DC Bus Voltage Fluctuations

IR 651865, Potential Adverse Trend on Division 4 DC Bus Voltage

CPS System DC Equipment Failure Report for July 2005 to July 2007

1R15 Operability Evaluations

IR 671001, Essential switchgear cooling "C" shutdown service water line thickness below minimum screening criteria; September 13, 2007

EC 367363, Minimum wall calculation for reducer small ends for 3"X1.5" swg at valve 1SX025C on line 1SX23AC-3", Revision 0

IR 667633, Through body leak 1SX019B; September 4, 2007

IR 667865, Issues identified during disassembly of 1SX019B valve; September 5, 2007

IR 667974, LL valve has through body leak after decision to defer repair; September 5, 2007

IR 668216, ASME code case N-513-1, Augmented volumetric exam of 1SX20AA; September 5, 2007

IR 668217, ASME code case N-513-1, augmented volumetric exam of 1SX23BA; September 5, 2007

IR 668220, ASME code case N-513-1, augmented volumetric exam of 1SX23AB; September 5, 2007

IR 668221, ASME code case N-513-1, augmented volumetric exam of 1SX23AC; September 5, 2007

IR 668223, ASME code case N-513-1, augmented volumetric exam of 1SX04AC; September 5, 2007

IR 668304, Division 3 control room ventilation chiller shutdown service water supply/return vacuum breakers leaking; September 6, 2007

IR 670094, Division 3 shutdown service water ultrasonic testing results below screening criteria; September 11, 2007

IR 670193, Essential switchgear cooling "A" shutdown service water piping ultrasonic testing results below screening criteria; September 11, 2007

IR 670479, Isolated points on shutdown service water "A" piping less than minimum evaluation criteria; September 12, 2007

EC 367242, Temporary acceptance of pitting of the VC-B head pressure controller valve body, 1SX019B; Revision 0

IR 666899, 1SX019B: Cavitation damage found in valve body; August 31, 2007

IR 658234, NRC Questions on OPEVAL 655836-02; August 07, 2007

1R19 Post Maintenance Testing

IR 671554, 0VC03CA fan replacement post job review - WW 0736; September 14, 2007

EC 366835, Modification to replace supply fan 0VC03CA; Revision 0

WO 969991, 0VC03CA -VC "A" Supply Fan Noise; September 9, 2007

IR 675847, Cut O-rings; September 26, 2007

IR 675914, Division 3 emergency diesel generator turbocharger drain tubing missing; September 26, 2007

IR 676864, Out of specification parameters on Division 3 diesel generator during surveillance run; September 28, 2007

IR 676905, K1 Lockout relay failed to trip emergency diesel generator; September 28, 2007
WO 795653, Replace Normally deenergized relay 1E22S001B-8; September 28, 2007
WO 1005265, Division 3 diesel generator six year maintenance: September 28, 2007
CPS 9080.03, Diesel generator 1C operability - Manual quick start operability; Revision 28e
CPS 3316.01,
CPS Operations Narrative Logs for August 14, 2007
WO 909977, Replace Rosemount Transmitter
WO 318466, EM Troubleshoot/Repair 1DC07E

1R22 Surveillance Testing

CPS 9054.01D002, "RCIC (1E51 – C001) High Pressure Operability Checks Checklist,"
Revision 23a
CPS 9054.01C002, "RCIC (1E51 – C001) High Pressure Operability Check," Revision 2b
CPS 9054.01, "RCIC System Operability Check," Revision 42e
IR 657976, "Unexpected Alarm 5063 -1D RCIC Pump Suction Press"
IR 658065, "1E51-F059 Limit switch Didn't Operate Properly During 9054.01"
IR 627527, "1E51N003: Computer Point E51DA001 Out of Spec Low (OOT)"
IR 658055, "RCIC Turbine Steam Disch Press Gauge Reads Zero #"
CPS 9052.01, LPCS/RHR A Pumps & LPCS/RHR A Water Leg Pump Operability, 09/13/06;
Revision 43d,
IR 655830, 1E21F349A Unquantifiable Seat Leakage
IR 655831, 1E21F350A Unquantifiable Seat Leakage
IR 655833, 1E21R501, Gauge Overanged During 9052.01
IR 655836, 1E12F084A, WLP Check To RHR A, failed to close
IR 655838, 1E12F085A, WLP to RHR a, failed to close
IR 658200, Senior Resident Has Question on RCIC Alarm; August 07, 2007
Clinton Power Station Updated Final Safety Analysis Report
CPS Technical Specification Surveillance Requirement 3.8.1.3 and associated bases
CPS 9080.02, Diesel generator 1B Operability - Manual and Quick Start Operability;
Revision 47d
IR 660893, NRC Questioned KVAR Loading on 9080.02 Division 2 Diesel; August 15, 2007
CPS 9069.01, Shutdown Service Water Operability Test; Revision 45
CPS Technical Specification 3.7.1/3.7.2 and associated bases
CPS 9861.09D007, Leakage Test on Valve 1CC075B and 1CC076B, Revision 1a

2PS2 Radioactive Material Processing and Transportation

USAR Chapter 11 Solid and Liquid Radwaste Management System, Revision 11
2006 Annual Radioactive Effluent Release Report; dated April 27, 2007
AR 435702; Chemistry, Radwaste, Effluent and Environmental Monitoring Audit Report Audit
NOSA-CPS-06-04; dated April 19, 2006
AR 302506; Contamination Found in a Twenty Foot Sea Van; dated February 17, 2005
AR 309873; Incorrect Dose Rate Listed in Waste Shipment Notification; dated March 8, 2005
AR 345179; Legacy Filter Waste Stores Without an Inventory; dated June 17, 2005
AR 354609; Laundry Trailer Found with Small Hole in Flooring; dated July 19, 2005
AR 430473; FlatBed Trailer Separated from Semi-Tractor While Moving; dated
December 5, 2005
AR 451440; Incomplete Departure Survey Documentation; dated February 8, 2006
AR 476188; Radioactive Shipping Documentation Errors; dated April 7, 2006
AR 539967; Inability to Transfer Waste Sludge to Vendor; dated October 4, 2006

AR 569198; Radiation Protection Audit Report; dated September 5, 2007
AR 577885; 0WX02TA:Lessons Learned On 10 CFR 61 Analysis; dated January 11, 2007
AR 578765; Invalid Data initially Generated; dated January 12, 2007
AR 585131; Deficiencies in Shipping Documents Found; dated January 30, 2007
AR 617139; Radwaste Vendor Processing Creates Elevated Dose Rates in Walkway; dated April 14, 2007
AR 626907; Water on Floor of Sealand Number 59; dated May 8, 2007
AR 643431; Fluid Found on Incoming Radioactive Material Shipment; dated June 22, 2007
AR 661628; Rotor Cribbing Found Deteriorating More Than Last Inspection; dated August 17, 2007
AR 672300; Approximately 50 Milliliters Leak From Sealand Onto Trailer; dated September 17, 2007
ASSA 563448; Transportation and Radwaste Self-assessment; dated July 20, 2007
ASSA 581780-04; detailed Review of 2004 Through 2006 Shipping Records; dated January 31, 2007
RP-AA-100; Process Control Program For Radioactive Wastes; Revision 4
RP-AA-600; Radioactive Material/Waste Shipments; Revision 10
RP-AA-602; Packaging of Radioactive Material Shipments; Revision 12
RP-AA-603; Inspection and Loading of Radioactive Material Shipments; Revision 3
RP-CL-605-1001; CPS 10 CFR Part 61 Program; Revision 1
CPS 3909.01; Operating Spent Resin System; Revision 21
CPS 3909.02; Operating Phase Separators; Revision 20e
CPS 3909.03; Operating Waste Sludge System; Revision 20d
CPS 3909.04; Operating Concentrate Waste System; Revision 15b
CPS 3909.05; Operating Fuel Pool Filter Demineralizer Sludge System; Revision 12b
CPS 6418.04; Analysis of Radwaste Samples for Solid Waste Processing; Revision 9b
CY-AA-110-200; Sampling; Revision 5
CPS 3222.10; Reactor Sample Station; Revision 10

2OS1 Access Control to Radiologically Significant Areas

AR289955; NOSA-CPS-05-06; Health Physics Functional Area Nuclear Oversight Audit; dated July 27, 2005
AR 537844; Purple Painted tool Found Outside the Radiologically Restricted Area; dated August 29, 2006
AR 575308; Building wall Damaged in Rotor Storage Building; dated January 4, 2007
AR 582546; 1DR1-142 Door Hanging-up; dated January 24, 2007
AR 601273; High Radiation Area Near Miss Event; dated March 8, 2007
AR 633042; Emergent High Radiation Area Access; dated May 23, 2007
AR 630925; Radiography Inspection Terminated Due To Boundary Dose Rates; dated May 16, 2007
RP-AA-210; Dosimetry Issue; Usage and Control; Revision 10
RP-AA-460; Controls for High and Very High Radiation Areas; Revision 12
RP-AA-460-101; Radiological Key Control and Area Access Requirements; Revision 3a
RP-AA-460-1001; Additional High Radiation Exposure Control; Revision 2
RP-AA-460-1002; High Radiation Area and Locked High Radiation Areas Briefing Form
RWP 10002868; Spent Fuel Pool Re-Rack Diving; Revision 0
RWP 10007956; Spent Fuel Pool Re-Rack; Revision 3

OA2 Identification and Resolution of Problems

OP-AA-102-103; Operator Work-Around Program; Revision 1

CPS 9000.10; Accident Monitoring And Remote Shutdown Instrumentation Log; Revision 31a

IR 610835; Eval. Division 1 & 2 H2O2 Monitor INOP Printers: OPS Workaround; March 30, 2007

IR 624538; NOS ID Operations Workaround Leads To Fire Door Impairment; May 2, 2007

IR 575009; Permanent Access Solution Needed For 1FW004 Valve; January 3, 2007

IR 617958; Off-Normal Response Enhancement; April 16, 2007

IR 572918; Eval. Main Turbine BRG #9 Vibe Problem As Operator Challenge; December 25, 2006

IR 567237; 1KYCP105H Repeat Timer Did Not Advance - OP Challenge; December 9, 2006

IR 642744; TDRFP 'B' Turning Gear Failed To Disengage Automatically; June 21, 2007

IR 652502; 1HG02CA Greater Than 3 Hours Run Time In July 2007; July 22, 2007

IR 656515; Missed Opportunity For Operator Work Around/Challenge Review; August 2, 2007

WO 843352; Task 01; Contingent Task To Disassemble, Inspect And Repair Valve 1E12F009 Due Seat Leakage

OA3 Event Followup

LER 05-461/2007-003-00, IGSCC Causes Pressure Boundary Leak and Reactor Shutdown; August 16, 2007

IR 641375, 4001.01 Reactor Coolant Leakage; June 18, 2007

RCR 641375, Flexible hose failure on Main Steam Line "C" results in manual reactor shutdown for replacement

LIST OF ACRONYMS USED

ADAMS	Agency wide Documents Access and Management System
ALARA	As-Low-As-Reasonably-Achievable
CPS	Clinton Power Station
CR	Condition Report
DAW	Dry Active Waste
DOT	Department of Transportation
EP	Emergence Preparedness
ERAT	Emergency Reserve Auxiliary Transformer
FPER	Fire Protection Evaluation Report
HPCS	High Pressure Core Spray
HRA	High Radiation Area
HVAC	Heating Ventilation and Cooling
IMC	Inspection Manual Chapter
IR	Issue Report
LCO	Limited Condition for Operation
LPCS	Low Pressure Core Spray
LSA	Low Specific Activity
MR	Maintenance Rule
MSPI	Mitigating System Performance Indicator
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OPC	Operational Support Center
OSC	Operational Support Center
PARS	Publicly Available Records
PI	Performance Indicator
PMT	Post Maintenance Testing
Radwaste	Radioactive Waste
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RP	Radiation Protection
RPT	Radiation Protection Technician
RWP	Radiation Work Permit
SDP	Significant Determination Process
SVC	Static VAR Compensator
TS	Technical Specification
URI	Unresolved Item
USAR	Updated Safety Analysis Report
WAB	Work Around Board
WO	Work Order