September 18, 2001

EA-01-028
EA-01-153
EA-01-170

Mr. Oliver D. Kingsley, President
and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: CLINTON POWER STATION
NRC INSPECTION REPORT 50-461/01-10(DRP)

Dear Mr. Kingsley:

On August 21, 2001, the NRC completed a safety inspection at your Clinton Power Station. The enclosed report documents the inspection findings, which were discussed on August 21, 2001, with Mr. M. Pacilio and other members of your staff.

This inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

Based on the results of this inspection, the inspectors identified two issues of very low safety significance (Green). The issues were determined to involve violations of NRC requirements. However, because of their very low safety significance and because they have been entered into your corrective action program, the NRC is treating these issues as Non-Cited Violations, in accordance with Section VI.A.1 of the NRC's Enforcement Policy. If you deny these Non-Cited Violations, you should provide a response with the basis for your denial, within 30 days of the date of this inspection report, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region III; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Clinton Power Station.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

Original signed by
Christine A. Lipa

Christine A. Lipa, Chief
Branch 4
Division of Reactor Projects

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

Enclosure: Inspection Report No. 50-461/01-10(DRP)

cc w/encl: J. Heffley, Vice President
W. Bohlke, Senior Vice President
Nuclear Services
J. Cotton, Senior Vice President -
Operations Support
M. Pacilio, Plant Manager
R. Krich, Director - Licensing
J. Skolds, Chief Operating Officer
C. Crane, Senior Vice President -
Mid-West Regional Operating Group
J. Benjamin, Vice President - Licensing
And Regulatory Affairs
H. Stanley, Operations Vice President
R. Helfrich, Senior Counsel, Nuclear
Mid-West Regional Operating Group
W. Illiff, Regulatory Assurance Manager
Document Control Desk-Licensing
Illinois Department of Nuclear Safety

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/s/Christine A. Lipa

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	50-461/01-10(DRP)
Licensee:	AmerGen Energy Company, LLC
Facility:	Clinton Power Station
Location:	Route 54 West Clinton, IL 61727
Dates:	June 30 through August 21, 2001
Inspectors:	P. L. Louden, Senior Resident Inspector C. E. Brown, Resident Inspector E. R. Duncan, Senior Resident Inspector, LaSalle J. L. Belanger, Senior Physical Security Inspector S. K. Orth, Senior Radiation Specialist V. P. Loughheed, Senior Reactor Engineer D. E. Zemel, Illinois Department of Nuclear Safety
Approved by:	Christine A. Lipa, Chief Branch 4 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000461-2001-10, on 06/30-08/21/2001, AmerGen Energy Company LLC, Clinton Power Station; Event Followup; Radiation Monitoring Instrumentation.

This report covers a 7-week routine inspection, conducted by resident and regional specialist inspectors. Two findings of very low risk significance were identified during this inspection. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at: http://www.nrc.gov/NRR/OVERSIGHT/index.html. Findings for which the SDP does not apply are indicated by "No Color" or by the severity level of the applicable violations.

A. Inspector Identified Findings

Cornerstone: Initiating Events

Green. Human performance and corrective action deficiencies contributed to a Non-Cited Violation of Technical Specification 5.4.1 for failing to follow procedures. This led to the unplanned automatic reactor shutdown on July 24, 2001.

The finding was of very low safety significance because no complications occurred during the unplanned automatic reactor shut down and the finding did not increase the likelihood of mitigation equipment being unavailable (Section 4OA3).

Cornerstone: Emergency Preparedness

Green. A Non-Cited Violation of 10 CFR Part 50.54(q) was identified by the NRC associated with the failure to maintain personnel qualifications for self-contained breathing apparatus in accordance with the Clinton Power Station Emergency Plan.

The finding was of very low safety significance because the licensee maintained an adequate number of qualified personnel to maintain minimum coverage of the required positions identified in the Emergency Plan (Section 2OS3.2).

B. Licensee Identified Violations

A violation of very low significance which was identified by the licensee has been reviewed by the inspectors. Corrective actions taken or planned by the licensee appear reasonable. The violation is listed in Section 4OA7 of this report.

Report Details

Summary of Plant Status

The plant was operated at essentially 100 percent power for most of the inspection period. On July 24, 2001, the reactor automatically shut down as a result of maintenance errors while conducting a planned surveillance test on the feedwater level control system. The reactor was subsequently restarted on July 25 and remained online for the balance of the inspection period.

1. Reactor Safety

1R04 Equipment Alignments (71111.04)

a. Inspection Scope

The inspectors reviewed piping and instrument diagrams, system procedures, training manuals, previously identified equipment deficiencies, condition reports, and vendor information as part of a partial system walkdown of the high pressure core spray system. These activities were conducted to verify that equipment was appropriately aligned for this high risk-importance safety system during a reactor core isolation cooling system maintenance outage.

b. Findings

No findings of significance were identified.

1R05 Fire Protection (71111.05)

a. Inspection Scope

The inspectors reviewed portions of the licensee's Fire Protection Evaluation Report (FPER) and the Updated Safety Analysis Report (USAR) to verify consistency in the documented analysis with installed fire protection equipment at the station. To assess the control of transient combustibles and ignition sources, the material and operational condition of fire-protection systems and equipment, and the status of fire barriers, the inspectors conducted walk downs of the following risk significant areas:

- Emergency Core Cooling System pump rooms
- Control Building 828' control room ventilation system areas for both trains
- Main turbine elevation and reactor feedwater pump rooms
- Condensate, condensate booster, and control rod drive pump areas

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

On July 26, 2001, the inspectors observed heat exchanger performance testing of Division II Emergency Diesel Generator Jacket Water Coolers 1DG11AB and 1DG12AB. The inspectors verified that the test acceptance criteria appropriately considered differences between testing conditions and design conditions, that the inspection results were appropriately categorized against pre-established engineered acceptance criteria and were acceptable, that the frequency of testing was sufficient to detect degradation prior to the loss of heat removal capabilities below design basis values, and that the test results considered test instrument inaccuracies and differences. The following documents were reviewed during this inspection activity:

- CPS 2700.17, "Division II Diesel Generator (12 Cylinder) Jacket Water Cooler (1DG11AB) Heat Exchanger Performance Covered By NRC Generic Letter 89-13," Revision 3
- CPS 2700.18, "Division II Diesel Generator (16 Cylinder) Jacket Water Cooler (1DG12AB) Heat Exchanger Performance Covered By NRC Generic Letter 89-13," Revision 3

b. Findings

No findings of significance were identified.

1R12 Maintenance Rule Implementation (71111.12)

a. Inspection Scope

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

- Auxiliary power system with emphasis on Static-VAR (Volt-Ampere-reactive)-Compensator (SVC) breakers, surveillance testing procedures, spare parts, and planned maintenance.
- 125 Volt direct current system safety related batteries

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors observed the licensee's risk assessment processes and considerations used to plan and schedule maintenance activities on safety-related structures, systems, and components particularly to ensure that maintenance risk and emergent work contingencies had been identified and resolved. The inspectors assessed the effectiveness of risk management activities for the following work activities or work weeks:

- Control room ventilation train "A" outage work to affect repairs on degraded back draft dampers commensurate with an emergent problem associated with drywell ventilation train "A" problems.
- Risk assessments conducted to perform corrective maintenance on the Division III emergency diesel generator (EDG) while elevated room temperatures were present in the reactor core isolation cooling (RCIC) system pump room.

b. Findings

No findings of significance were identified.

1R14 Personnel Performance During Non-routine Plant Evolutions (71111.14)

a. Inspection Scope

The inspectors reviewed personnel performance during reactor startup activities following the unplanned automatic reactor shut down on July 24, 2001. The inspectors observed reactivity manipulations during power ascension and the synchronization of the main generator onto the offsite electrical distribution system. The review was performed to ascertain that operators' responses were in accordance with required procedures and standards of operations conduct.

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 ensure that operability was properly justified and the component or system remained available such that no unrecognized risk increase had occurred.

- Condition report 2-01-07-211-OD, "Evaluate 1FW10A/B for Continued Operability". This operability determination reviewed whether feedwater injection check valves 1B21-FW010A and 1B21-FW010B were exposed to conditions which could adversely impact the soft seats of the valves following the July 24, 2001, reactor scram.

- Condition report 2-01-06-289-OD, “10 CFR Part 21 on 2301A Electronic Governors Installed on the Division 1 and 2 DG Units”. This operability determination was reviewed to understand the site specific effects of the 10 CFR Part 21 reported condition. The Division I and II EDGs at the station employ the subject electronic governors.
- Condition Report 2-01-07-262 “Elevated RCIC Room High Temperatures” and supporting engineering assessments. This operability determination was reviewed to review the licensee’s assessment of high pump room temperatures due in part to increasing lake temperatures for the high risk significant RCIC system.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors reviewed and observed portions of the following post-maintenance testing (PMT) activities involving risk significant equipment to ensure that the activities were adequate to verify system operability and functional capability:

- Control Room ventilation system train “A” return to service post maintenance testing following damper and hydramotor repairs; work orders 00001684, 0001980901, 0002091801.
- Post maintenance testing conducted following a maintenance outage for the low pressure core spray and residual heat removal train “A” systems.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities (71111.20)

a. Inspection Scope

The inspectors evaluated the licensee’s forced outage activities following the July 24, 2001 automatic reactor shut down to ensure that risk considerations were incorporated into outage schedules; risk reduction methodologies were used for plant configuration control; mitigation strategies to losses of key safety functions had been developed; and operating license and Technical Specification (TS) requirements that ensured defense-in-depth were maintained. The inspectors maintained a particular focus on the completion of VC train “B” work for returning the system to service and walkdowns/engineering activities conducted to assess any potential damage to main steam lines as a result of high reactor vessel water level conditions experienced during the automatic reactor shutdown.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors observed portions of the following surveillance tests to verify that risk significant systems and equipment were capable of performing their intended safety functions and assessed their operational readiness:

- Reviewed and observed preparations and performance of VC system train "A" surveillance activities.
- Reactor Core Isolation Cooling System quarterly operability check
- Division III EDG monthly surveillance

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

2OS1 Access Control to Radiologically Significant Areas (71121.01)

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

a. Inspection Scope

The inspectors reviewed radiological conditions of work areas within radiation areas and high radiation areas (Containment Building, Fuel Handling Building, and Auxiliary Building). The inspectors performed independent measurements of area radiation levels and reviewed associated licensee controls and surveys to determine if controls (surveys, postings, and barricades) were adequate to meet the requirements of 10 CFR Part 20 and the licensee's TSs.

b. Findings

No findings of significance were identified.

.2 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed documentation (CR and root cause evaluation) for a performance indicator (occupational exposure control effectiveness) occurrence that happened during the Fall 2000 refueling outage. The inspectors reviewed the occurrence to determine what radiological barriers had failed and what barriers remained to prevent personnel access and to limit the potential for an overexposure.

b. Findings

A licensee-identified Green finding and associated Non-Cited Violation was identified and is described in Section 4OA7 of this report.

2OS3 Radiation Monitoring Instrumentation (71121.03)

.1 Source Tests and Calibrations of Radiation Monitoring Instrumentation

a. Inspection Scope

The inspectors reviewed the calibrations and source tests of radiation monitoring instrumentation to ensure that instruments that were used for the protection of occupational workers were calibrated and tested in accordance with licensee procedures. Specifically, the inspectors reviewed calibration records (previous 12 months) for the following radiation monitoring instruments:

- Personnel Contamination Monitors
- Small Articles Monitors
- Whole Body Counters

The inspectors also reviewed the most recent calibrations for the following area radiation monitors (ARMs) and continuous airborne monitors (CAMs) to ensure that the monitors were calibrated in accordance with the licensee's TSs and procedures:

- Traversing Incore Probe Drive Mechanism ARM (1RIX-AR003)
- Spent Fuel Storage Pool ARM (1RIX-AR015)
- Inclined Fuel Transfer System Isolation Valve ARM (1RIX-AR023)
- Main Control Room ARM (1RIX-AR035)
- Chemical Waste Tank ARM (0RIX-AR001)
- Containment Polar Crane ARM (1RE-AR025)
- Main Steam Line Radiation Monitors (D17-K610(A-D))
- Main Control Room Intake CAMs (1RIX-PR09(A-D))
- Radwaste Building CAM No. 1 (1RIX-PR014)

The inspectors observed in-field source tests of portal contamination monitors, small article monitors, ion chambers, neutron detectors, and Geiger Mueller detectors and observed a calibration of a lapel air sampler and two portable air samplers to ensure that the radiation protection staff adequately tested and calibrated the instruments. The inspectors also reviewed instruments stored in the licensee's calibration facility and verified that those instruments "ready for use" had current calibrations. In addition, the inspectors reviewed quality control records for the post accident sampling system (PASS) to ensure that the PASS was capable of obtaining representative samples of the reactor coolant system.

b. Findings

No findings of significance were identified.

.2 Respiratory Protection

a. Inspection Scope

The inspectors reviewed the licensee's respiratory protection program to ensure that self-contained breathing apparatus (SCBAs) were properly maintained and stored and to ensure that personnel required to don SCBAs were qualified. Specifically, the inspector reviewed the monthly testing records (July 2000 to July 2001) for SCBAs located in various areas within the site. The inspectors also performed walkdowns of the SCBA storage locations and inspected a sample of the units to assess the material condition of the equipment. In addition, the inspectors reviewed the licensee's current training and qualification records and verified that applicable emergency response, fire brigade, and control room personnel were currently trained and qualified for SCBA use, as required by the Emergency Plan, Updated Final Safety Analysis Report, and plant procedures.

b. Findings

Green. A Non-Cited Violation of 10 CFR Part 50.54(q) for failing to follow and maintain emergency plans which meet the standards of 10 CFR Part 50.47(b). The inspectors identified that the licensee had failed to maintain the required level of SCBA qualifications for emergency responders as described in emergency plan implementing procedures.

The licensee's Emergency Plan contained a description of the emergency response training program, which included a training matrix (Emergency Planning Training Program Description) and the implementation of Emergency Plan Implementing Procedure (EPIP) AP-05. Procedure AP-05 stated that personnel who were required to maintain respiratory protection/SCBA qualifications would be monitored to ensure that at least 90 percent of them by each discipline/position were currently qualified. In accordance with the licensee's Emergency Plan, the Emergency Planning Training Program Description (Revision 47) specified the emergency response positions that required respiratory protection/SCBA qualifications, which included In-station Radiological Control/PASS; PASS Team Leader; Emergency Team Member; and In-station Radiological Control positions.

The inspectors and licensee compared the staff qualified to don SCBAs to the roster of emergency responders. As a result of this review, the inspectors observed that the following disciplines of Emergency Team Members did not have a population of 90 percent that were currently qualified for respiratory protection/SCBAs: Control and Instrumentation (82 percent), Electrical (67 percent), Mechanical (67 percent), and Utility (40 percent). The licensee indicated that some of the qualification data may have been approximate due to the lack of certainty in its qualification data base; however, the licensee acknowledged that the level of emergency responders qualified for respiratory protection/SCBA use was below the requirement contained in EPIP AP-05. In addition, the emergency preparedness staff stated that it had not adequately monitored the respiratory protection/SCBA qualifications since about April 2001, due to difficulties with the licensee's recently implemented computer software system. Consequently, the inspector concluded that the licensee had not

taken adequate actions to ensure that the stated percentage of the emergency response organization maintained the respiratory protection/SCBA qualifications, as required by EPIP AP-05.

This finding, if left uncorrected, would become a more significant concern and could result in insufficient qualified personnel available to respond to a radiological emergency event. Specifically, the licensee's Emergency Plan provided for a number of respiratory protection/SCBA qualified personnel. The failure to maintain that commitment could result in the licensee's inability to provide adequate protection for those personnel responding to an incident. Therefore, the issue was reviewed using the NRC Significance Determination Process (SDP) for the emergency preparedness cornerstone. The inspector concluded that the finding represented a violation of 10 CFR Part 50.54(q), which requires that the licensee implement its Emergency Plan. However, the finding did not represent an actual event implementation problem, a drill or exercise critique problem, or a failure to meet a planning standard (i.e., the level of qualified personnel remained sufficient to meet minimum staffing requirements).

The requirements of 10 CFR Part 50.54(q) state, in part, that the licensee shall follow and maintain in effect emergency plans which meet the standards in 10 CFR Part 50.47(b) and the requirements in 10 CFR Part 50 Appendix E. Section 5.4 of the Clinton Power Station Emergency Plan contained requirements for emergency response personnel training, which met the training and qualification requirements contained in 10 CFR Part 50.47(b)(15), and stated that training will be performed in accordance with EPIP AP-05. Contrary to these requirements, the licensee failed to maintain the required level of respiratory protection/SCBA qualifications as described in AP-05. This is considered a violation of 10 CFR Part 50.54(q). However, because of the very low safety significance of the item and because the licensee has included this item in its corrective action program (CR 2-01-08-040), this violation is being treated as a Non-Cited Violation (NCV 50-461/01-10-01).

.3 Problem Identification and Resolution

a. Inspection Scope

The inspectors reviewed the licensee's self-assessments, audits, and CRs (July 2000 through July 2001) concerning radiation monitoring instrumentation and the respiratory protection program. The inspectors reviewed these documents to assess the licensee's ability to identify repetitive problems, contributing causes, the extent of conditions, and corrective actions which will achieve lasting results.

The inspectors also reviewed an internal dose investigation that resulted from an individual alarming a portal contamination monitor (July 2000 through July 2001) to ensure that the licensee adequately evaluated the incident.

b. Findings

No findings of significance were identified.

3. SAFEGUARDS

3PP1 Access Authorization (71130.01)

a. Inspection Scope

The inspectors interviewed five supervisors and six non-supervisors (both licensee and contractor employees) to determine their knowledge level and practice of implementing the licensee's behavior observation program responsibilities. Selected procedures pertaining to the Behavior Observation Program and associated training activities were also reviewed. Also licensee fitness-for-duty semi-annual test results were reviewed. In addition, the inspectors reviewed a sample of licensee self-assessments, audits, and security logged events. The inspectors also interviewed security managers to evaluate their knowledge and use of the licensee's corrective action system.

b. Findings

No findings of significance were identified.

3PP2 Access Control (71130.02)

a. Inspection Scope

The inspectors reviewed the licensee's protected area access control testing and maintenance procedures. The inspectors observed licensee testing of all access control equipment to determine if testing and maintenance practices were performance based. On two occasions, during peak ingress periods, the inspector observed in-processing search of personnel, packages, and vehicles to determine if search practices were conducted in accordance with regulatory requirements. Interviews were conducted and records were reviewed to verify that security staffing levels were consistently and appropriately implemented. Also the inspectors reviewed the licensee's process for limiting access to only authorized personnel to the protected area and vital equipment by a sample review of quarterly access authorization reviews performed by managers. The inspectors reviewed the licensee's program to control hard-keys and computer input of security-related personnel data.

The inspectors reviewed a sample of licensee self-assessments, audits, maintenance request records, and security logged events for identification and resolution of problems. In addition, the inspectors interviewed security managers to evaluate their knowledge and use of the licensee's corrective action system.

b. Findings

No findings of significance were identified.

4. Other Activities

4OA1 Performance Indicator Verification (71151)

a. Inspection Scope

The inspectors verified the data for the Physical Protection Performance Indicators (PI) pertaining to Fitness-For-Duty Personnel Reliability, Personnel Screening Program, and Protected Area Security Equipment. Specifically, a sample of plant reports related to security events, security shift activity logs, fitness-for-duty reports, and applicable security records were reviewed for the period between October 1, 2000, and July 9, 2001.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

As discussed in Section 4OA3 of this report, the root cause of the automatic reactor shut down on July 24, 2001, involved human performance deficiencies. Human performance problems in the maintenance area was the subject of a No Color finding as discussed in Inspection Report 50-461/00-15 Section 4OA4. In response to the No Color finding, the licensee issued CR 2-00-09-055 to capture the human performance concern not only in the maintenance organization but station wide. The corrective actions taken to address the concerns in CR 2-00-09-055 included specialized training on error prevention techniques, self-checking, and pre-job briefing requirements. As discussed in Section 4OA3 of this report, programmatic barriers which broke down leading to the July 24, 2001, automatic shut down included a sub-standard pre-job briefing, poor self checking on the part of the maintenance technicians conducting the surveillance test, and ineffective procedure place-keeping (an error prevention technique). Taking these elements into consideration, it was apparent that the effectiveness of the corrective actions taken to date to address the previous human performance concerns have been less than fully effective. The inspectors will continue to monitor the licensee's performance regarding human performance and the effectiveness of corrective actions. The results of these reviews will be integrated into the next IP 71152 "Problem Identification and Resolution" inspection currently scheduled for December 2001.

4OA3 Event Follow-up (71153)

a. Inspection Scope

The inspectors responded to and evaluated control room personnel performance in response to an automatic reactor shutdown on July 24, 2001, which occurred while a surveillance test was being conducted on the feedwater level control system. The inspectors responded to the site after being notified of the unplanned automatic reactor shutdown and verified that plant conditions were stable and that the operators had used appropriate emergency operating procedures (EOPs) during the shutdown. The

inspectors then observed and evaluated the licensee's root cause evaluation conducted to identify the cause of the automatic shut down.

b. Findings

Green. A Non-Cited Violation of T.S. 5.4.1.a was identified for failing to follow a procedure which resulted in an unplanned automatic reactor shutdown. On July 24, 2001, during a planned surveillance on the feedwater level control system, the reactor automatically shut down at 2:51 a.m. The licensee was conducting the surveillance test in accordance with CPS procedure 9538.03 "FW Reactor Vessel Water Level C34-N004(B,C) Channel Functional" when a maintenance technician performed a wrong step in the procedure. The performance of this step caused the feedwater level control system to sense "0 inches" water level in the reactor vessel. The feedwater level control system responded to this sensed reading by increasing feedwater flow to maximum. Subsequently, actual reactor water level rose rapidly and the reactor automatically shut down on a high water level signal (Level 8). The plant responded as designed and operators brought the reactor to a safe hot shutdown condition shortly after the automatic shutdown occurred.

The licensee's investigation concluded that maintenance technicians' failure to follow the test procedure they were performing at the time was the cause of the event. The maintenance technicians performed a step on the surveillance test procedure that was not to be performed with the plant in at power conditions. The performance of this step caused the feedwater level control system to sense that the reactor vessel water level was at "0 inches" narrow range and the control system responded by increasing feed water flow to the reactor vessel. The human performance deficiencies involved in this event included pre-job briefing inadequacies, poor self checking and peer checking, poor use of error prevention techniques, and inadequate concurrent verification techniques. Human performance problems have been the subject of No Color findings in the past. Further discussion on the human performance problems in the maintenance organization are discussed in Section 4OA4 of this report. Also, since the licensee had taken corrective actions to address the previously identified human performance concerns, the effectiveness of the corrective actions are addressed in Section 4OA2 of this report.

The inspectors considered this issue to be more than minor because the failure to follow the surveillance test procedure guidance had a credible impact on safety. This impact was realized as the result of the error led to a feedwater transient and an automatic reactor shutdown. The finding affected the initiating event cornerstone. The inspectors used the guidance of NRC Manual Chapter 0609 "Significance Determination Process" to perform a Phase 1 analysis of the event. Since the finding only affected the likelihood of a reactor trip and did not affect the likelihood that mitigation equipment would be unavailable, it was determined to have very low risk significance (GREEN).

Technical Specification 5.4.1.a requires that written procedures be established, implemented, and maintained covering the activities recommended in Regulatory Guide 1.33, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, dated February 1978, Item 1d requires procedures for procedural adherence and temporary

changes. Exelon procedure AD-AA-104-101 "Procedure Use and Adherence," Revision 2 requires that procedures be followed as written. Contrary to these requirements, CPS surveillance test procedure 9538.03 "FW Reactor Vessel Water Level C34-N004(B,C) Channel Functional" Revision 34c was not followed as written and is considered a violation. Using the Significance Determination Process, this finding was determined to have very low safety significance because it only affected the likelihood of a reactor trip and did not affect the likelihood of mitigating equipment being unavailable. Because of the very low safety significance and because the issue is in the licensee's corrective action program (CR 2-01-07-209), it is being treated as a Non-Cited Violation, consistent with Section VI.A.1 of the NRC Enforcement Policy (NCV 50-461/01-10-02).

4OA4 Cross-Cutting Issues

Human Performance

As discussed in Section 4OA3 of this report, human performance deficiencies were the root cause of events which resulted in the automatic reactor shutdown on July 24, 2001. Human performance deficiencies within the maintenance and operations departments have been identified and discussed in prior inspection reports (IRs 50-461/00-15 and 50-461/00-20). The licensee took corrective actions to address these concerns, in part, through the development and implementation of a station wide human performance improvement plan. While the licensee has made progress in the implementation of the human performance plan, the issues associated with the July 24 automatic reactor shutdown indicate that human performance problems remain a concern at the station.

4OA5 Other

.1 (Closed) Unresolved Item (URI) No. 50-461/00-18-01: Misuse of Radioactive Material to Alarm a Personnel Contamination Monitor (PCM) (EA-01-170)

On October 20, 2000, a junior contract radiation protection technician used contaminated material to alarm a PCM while an individual was performing a contamination survey in the monitor. The NRC performed a review of that incident and concluded that the technician deliberately used licensed nuclear material in a manner that was not authorized by the Clinton Power Station Facility Operating License No. NPF-62, Section 2.B(5). Specifically, Section 2.B(5) of the license authorizes the receipt, possession, and use of byproduct material for sample analysis or instrument calibration or associated with radioactive apparatus or components. However, the technician used the byproduct material (a recovered radioactive particle) to cause an erroneous alarm on a PCM, as an individual was performing a contamination survey. That use of byproduct material was not authorized by the license.

Since the incident was determined to be a willful violation of NRC requirements, the violation was not subject to the NRC's Significance Determination Process, as described in NRC Manual Chapter 0609, "Significance Determination Process." Instead, the NRC evaluated the violation in accordance with the criteria contained in the NRC Enforcement Policy and determined it to be a Severity Level IV violation. Since the criteria contained in Section VI.A.1.d of the NRC Enforcement Policy were met, the NRC dispositioned the Severity Level IV violation as a Non-Cited Violation (NCV 50-461/01-10-03). The results of the NRC's determination were forwarded to the licensee in a July 27, 2001, letter from J. Grobe, NRC, to O. Kingsley, Exelon (EA-01-170).

.2 (Closed) Violation (VIO) No. 50-461/01-07-01: Violation of 10 CFR Part 50.7 "Employee Protection" (EA-01-028)

On April 6, 2001, the NRC Issued the licensee a Severity Level IV Notice of Violation (EA-01-028), which was associated with a violation of 10 CFR Part 50.7 that occurred on or about February 15, 2000, at the licensee's facility. The NRC determined that an adverse employment action occurred within the Nuclear Training Department (NTD) as a result of an employee's protected activities.

On May 4, 2001, the licensee responded to the NRC's Notice of Violation. Within its letter, the licensee indicated that the employment action was taken for reasons unrelated to the employee's protected activities. The NRC reviewed the licensee's response and concluded that the violation occurred as stated in the Notice of Violation.

During this inspection, the inspector verified that the licensee had completed the corrective actions described in its May 4, 2001, letter to the NRC:

(1) in March 2000, the licensee reversed the adverse employment action and provided the individual with his/her annual performance bonus;

(2) on May 2, 2001, the licensee performed a survey of the NTD to ensure that a safety conscious work environment existed;

(3) the Director of the NTD reaffirmed management's commitment to a work environment where every employee is encouraged to raise safety concerns without the fear of retaliation;

(4) licensee supervisors, directors, and managers received training associated with ensuring and promoting a safety conscious work environment; and

(5) the site vice president reinforced his expectations regarding a safety conscious work environment.

Based on the licensee's May 2001 survey of the NTD, the licensee concluded that the environment in the NTD was conducive to raising safety concerns without the fear of retaliation. Specifically, the employees' responses indicated that they understood their responsibility to raise safety issues and, generally, were familiar with the licensee's

methods for raising those issues. Nonetheless, the licensee implemented the above corrective actions to improve and maintain the safety conscious work environment. This item is closed.

.3 (Closed) Falsification of Records 10 CFR Part 50.9 Severity Level IV Violation (EA-01-153)

On July 2, 2001, by separate letter, NRC issued a Severity Level IV violation of 10 CFR Part 50.9 for a deliberate signature falsification by a plant test engineer. Following investigation by the Office of Investigations, NRC determined that, on October 20, 2000, a test engineer signed another employee's signature on two test package cover sheets without the employee's knowledge or consent, in violation of Clinton established plant protocol and procedure.

In determining the enforcement action for this violation, the NRC considered a number of factors. First, there was little safety significance to the issue as the post-modification tests were adequate and the individual whose signature was falsified indicated that he would have authorized acceptance of the tests, had he been contacted. Second, although the violation was deliberate, the violation involved the isolated actions of a low-level individual without management involvement. Third, the licensee discovered this violation during routine reviews of test documentation; informed the NRC of it, and promptly began an investigation into the issue. The investigation included re-reviewing the tests to verify equipment operability, revoking the access authorization for the individual, and looking for other occurrences where the individual might have falsified records. During the course of the investigation, the individual voluntarily resigned.

The licensee responded to the violation on July 31, 2001, acknowledging the violation and discussing the corrective actions taken. The NRC reviewed the scope of the corrective actions and determined them to be acceptable. This violation is closed. In order to provide record of this violation within the NRC's regulatory tracking program, the NRC is assigning the violation the following number (VIO 50-461/01-10-04).

4OA6 Meetings, including Exit

.1 The inspectors presented the inspection results to Mr. M. Pacilio, and other members of licensee management at the conclusion of the inspection period on August 21, 2001. The licensee acknowledged the findings presented. 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 Conducted

Senior Official at Exit:	J. M. Heffley
Date:	August 3, 2001
Proprietary:	None
Subject:	Occupational Radiation Safety
Change to Inspection Findings:	None

Senior Official at Exit: J. M. Heffley

Date:	July 13, 2001
Proprietary:	None
Subject:	Security Inspection
Change to Inspection Findings:	None

.2 End of Cycle Assessment Public Meeting

On July 13, 2001, the NRC Senior Resident Inspector assigned to Clinton Power Station and the Division of Reactor Projects Acting Chief, Branch 4 met with the licensee to discuss the NRC's Reactor Oversight Process (ROP) end-of-cycle assessment of safety performance for the Clinton Power Station during the period of April 2, 2000 - March 31, 2001. The major topics of discussion included the NRC's ROP assessment program, the NRC's Agency Action Matrix, and the results of the Clinton Power Station assessment. Attendees included licensee site management, members of the plant staff, representatives from the Illinois Department of Nuclear Safety, and local news media. Following the meeting, the NRC representatives answered questions from four local newspaper reporters who were in attendance.

4OA7 Licensee Identified Violations: The following finding of very low significance was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for being dispositioned as Non-Cited Violation (NCV).

NCV Tracking Number	Requirement Licensee Failed to Meet
50-461/01-10-05	Technical Specification 5.7.2 requires, in part, that high radiation areas in which an individual could receive a deep dose equivalent greater than or equal to 1000 millirem in 1 hour (at 30 centimeters) shall be provided with locked or continuously guarded doors to prevent unauthorized entry and that the keys to such doors shall be administratively controlled. During October 29 - 31, 2001, the licensee failed to maintain administrative control of a key that controlled five access points to high radiation areas specified above (i.e., lost the key and failed to perform required key inventories to identify its loss), as described in CR 2-00-11-016. This is being treated as a Non-Cited Violation.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

K. Baker, Design Engineering Manager
D. Basham, Acting Nuclear Oversight Manager
J. Bowers, Radiation Protection Shift Supervisor
J. Heffley, Site Vice President
W. Iliff, Director - Regulatory Assurance Director
M. Pacilio, Plant Manager
J. Randich, Work Management Director
J. Sears, Radiation Protection Director
R. Svaleson, Operations Director
F. Tsakeres, Maintenance Director
P. Walsh, Training Director
J. Williams, Site Engineering Director

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-461/01-10-01	NCV	Violation of 10 CFR Part 50.54(q) re. SCBA qualifications (Section 2OS3.2)
50-461/01-10-02	NCV	Failure to follow procedures associated with feed water level control system surveillance testing, TS 5.4.1 (Section 4OA3)
50-461/01-10-03	NCV	Misuse of radioactive material to alarm a PCM (Section 4OA5)
50-461/01-10-04	VIO	Falsification of post-modification procedure records (Section 4OA5)
50-461/01-10-05	NCV	Failure to maintain administrative control of high radiation area keys as required by TS 5.7.2 (Section 4OA7)

Closed

50-461/00-18-01	URI	Misuse of radioactive material to alarm a PCM (Section 4OA5)
50-461/01-07-01	VIO	Violation of 10 CFR Part. 50.7 “Employee Protection” (Section 4OA5)
50-461/01-10-01	NCV	Violation of 10 CFR Part 50.54(q) re. SCBA qualifications (Section 2OS3.2)
50-461/01-10-02	NCV	Failure to follow procedures associated with feed water level control system surveillance testing, TS 5.4.1 (Section 4OA3)

50-461/01-10-03	NCV	Misuse of radioactive material to alarm a PCM (Section 4OA5)
50-461/01-10-04	VIO	Falsification of post-modification procedure records (Section 4OA5)
50-461/01-10-05	NCV	Failure to maintain administrative control of high radiation area keys as required by TS 5.7.2 (Section 4OA7)

Discussed

None

LIST OF ACRONYMS

ADAMS	Agencywide Documents Access and Management System
ARM	Area Radiation Monitor
CAM	Continuous Airborne Monitor
CR	Condition Report
Div 1	Division 1
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedures
EPIP	Emergency Plan Implementing procedure
EP	Emergency Preparedness
FPER	Fire Protection Evaluation Report
IMC	Inspection Manual Chapter
MR	Maintenance Rule
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NTD	Nuclear Training Department
OS	Occupational Radiation Safety
PARS	Publicly Available Records
PASS	Post Accident Sampling System
PCM	Personnel Contamination Monitor
PERR	Public Electronic Reading Room
PI	Performance Indicators
PM	Preventative Maintenance
PMT	Post-Maintenance Testing
RCIC	Reactor Core Isolation Cooling
RG	Regulatory Guide
ROP	Reactor Oversight Process
RWP	Radiation Work Permit
SCBA	Self Contained Breathing Apparatus
SDP	Significance Determination Process
SI	Special Inspection
TS	Technical Specification
URI	Unresolved Item
USAR	Updated Safety Analysis Report
VIO	Violation

LIST OF DOCUMENTS REVIEWED

2OS1 Access Control to Radiologically Significant Areas

CPS 7000.21	Radiological Key Control and Area Access Requirements	Revisions 1a and 3a
CR 2-00-11-016	Loss of Restricted High Radiation Area Key Control	November 1, 2000

2OS3 Radiation Monitoring Instrumentation

	Chemistry Calibration Data Sheet for CPS 6209.01 *(performed on 7/11/01, 3/8/01, 1/24/01, 12/18/00, 7/27/00, and 4/14/00)*	November 30, 1999
	Clinton Power Station, Radiation Monitoring Self Assessment Report	April 9 - 12, 2001
	Emergency Planning, Training Program Description	Revision 47
	Fire Brigade Trained Personnel	September 2001 Roster
	Internal Dose Calculation, WBC No. 0106	November 4, 2000
	Memorandum from J. Bowers to J. Sears, “RP Staffing Augmentation Progress Results”	July 10, 2001
AP-01	Emergency Preparedness Training Program	Revision 10
AR 420396-01	Self-Assessment Report (A/R No. 420396-01), Whole Body Count Screening	
CPS 1890.30	Post Accident Sampling Program	Revision 13
CPS 6005.01	Post Accident Sampling	Revision 16
CPS 6005.01D002	PASS Operability Checklist Data Sheet *(performed on 1/10/00, 8/4/00, and 3/8/01)*	Revision 7
CPS 7180.10	CAM Sampling and Analysis	Revision 6e
CPS 7211.05	Radiation Protection Department Survey Instruments Response Checks	Revision 9
CPS 7410.33	Operation of the PCM-1 and PCM-2	Revision 11a
CPS 7600.02	Inspection and Storage of Respiratory Protection Equipment	Revision 3b
CPS 7600.02F001	Respiratory Protection Monthly Inspection Form *(completed on 7/29/01, 6/27/01, 4/23/01, 3/26/01, 3/19/01, 2/1/01, 12/24/00, 11/18/00, 10/27/00, 9/28/00, 8/18/00, and 7/21/00)*	Revision 1

CPS 7910.90	Calibration of Fastscan Whole Body Counter	Revision 3
CPS 7911.48	Calibration of the Gamma-60/40 Portal Monitor *(performed on 9/2/00 (No. 970243), 5/16/01 (No. 970242), 10/1/00 (No. 970241), 11/19/00 (No. 970250), 6/8/01 (No. 970249), 4/12/01 (No. 970244), 6/21/01 (No. 970245), 9/10/00 (No. 970246), and 2/20/01 (No. 970243))*	Revision 2
CPS 7911.49	Setup/Operational Checks of the Gamma-60/40 Portal Monitors	Revision 1b
CPS 7911.51	Calibration of NE SAM-9 Article Monitor *(performed on 7/28/00 and 1/29/01 (No. 222); on 10/24/00 and 4/30/01 (No. 289); on 10/24/00 and 4/25/01 (No. 290); on 11/5/00 and 5/27/01 (No. 106); and on 11/6/00, 7/17/01, and 7/24/01 (No. 280))*	Revision 0, Change PAC 0684-96
CPS 7911.52	Calibration of PCM-1 *(performed on 6/6/01 (No. 1203), 7/27/01 (No. 1446), 8/7/00 (No. 1205), 9/3/00 (No. 109), 9/27/00 (No. 151), 9/28/00 (No. 456), 9/28/00 (No. 300), 10/4/00 (No. 1435), 10/11/00 (No. 1455), 11/21/00 (No. 299), 3/10/01 (No. 1001), 3/18/01 (No. 341), 3/30/01 (No. 445), 5/8/01 (No. 1453), 5/17/01 (No. 1434), and 6/1/01 (No. 104))*	Revision 0
CPS 7911.53	Calibration of PCM-2 *(performed on 7/9/00, 10/28/00, 10/29/00, and 7/4/01 (No. 309); on 12/8/00 (No. 310); on 10/3/00 and 4/7/01 (No. 312); on 10/17/00 and 5/22/01 (No. 396); and on 10/11/00 and 5/18/01 (No. 397))*	Revision 0
CPS 8640.01	Connected Fixed and Portable Digital Area Radiation Monitor Calibration and Channel Functional Test *(performed on 1/27/00 (1RIX-AR003))*	Revision 35b
CPS 8640.03	EOF PING 1A CAM 1RIX-PR043 Functional/Calibration Test *(performed on 12/1/00)*	Revision 32
CPS 8640.04	Fixed Analog Area Radiation Monitor (ARM) 1RIS-AR024 (025 & 037), Channel Calibration *(performed on 7/14/00 (1RIS-AR025))*	Revision 33a

CPS 8640.11	Stand Alone Fixed Digital Area Radiation Monitor Calibration and Channel Functional Test *(performed on 8/30/00 (0RIX-AR001) and 8/22/00 (1RIX-AR023))*	Revision 2b
CPS 9431.08	RPS Main Steam Line Radiation D17-K610A(B,C,D) Channel Calibration *(performed on 12/11/00(A), 9/26/00(B), 5/31/00(C), and 10/2/00(D))*	Revision 37b
CPS 9437.60	Main Control Room Air Intake Radiation 1RIX-PR009A (B, C, D) Channel Calibration *(performed on 8/18/00)*	Revision 36a
CPS 9437.67	Area Radiation Monitors 1RIX-AR016 (19, 35, 52) Channel Calibration *(performed on 2/28/01 (AR016 and AR035))*	Revision 33b
CR 2-00-09-056	Air Supply Tubing for Sample Panel 1HSPS848 Ruptured	November 17, 2000
CR 2-00-10-227	PCM Not Calibrated and In Use	October 28, 2000
CR 2-01-01-034	Faulty MSA SCBA Low Pressure Alarms	January 5, 2001
CR 2-01-01-105	Unexpected Nonconservatism in Fourth Quarter 2000 Station Dose	January 17, 2001
CR 2-01-02-243	Missing Quarterly Calibration Check of the In-line PH Meter on the PASS Panel	February 26, 2001
CR 2-01-03-009	Several Maintenance Personnel Allowed to Expire on Their Annual Respirator Fit Test	March 1, 2001
CR 2-01-03-011	Inadequate Resources of Qualified RP Techs to Perform Various Functions	March 1, 2001
CR 2-01-03-021	Fire Brigade MSA SCBA Malfunctioned Upon Use	March 2, 2001
CR 2-01-03-075	Post Accident Sampling System (PASS) Unable to Obtain Undiluted Liquid Sample	March 20, 2001
CR 2-01-03-100	Expired Calibration Source	March 13, 2001
CR 2-01-04-041	RP Instrumentation Out of Calibration	April 12, 2001
CR 2-01-04-094	Daily Source Check Not Performed on RCA Exit SAM-11	April 12, 2001
CR 2-01-05-003	Notice of Violation 3-2000-012, Discrimination for Engaging in Protected Activities	May 1, 2001

CR 2-01-07-056	SCBA Malfunction During Use	July 6, 2001
CR 2-01-08-013	Calibrate/Check Calibration of the In-line PH Meter to the Post Accident Sampling System Quarterly Frequency Exceeded	August 1, 2001
CR 2-01-08-014	Incorrect Source Data Used During Calibration of SAM-9	August 1, 2001
CR 2-01-08-022	Fastscan Whole Body Counter Calibration Procedure Inadequate	August 2, 2001
CR 2-01-08-035	Procedure Steps Not Performed in Correct Order	August 2, 2001
CR 2-01-08-039	SCBA Monthly Inspection Forms Could Not Be Located	August 2, 2001
CR 2-01-08-040	ERO Member Respiratory Protection/SCBA Qualification	August 2, 2001
CR 2-01-08-045	Deficiencies Found in Monthly Respiratory Protection Equipment Inspections	August 3, 2001
Rpt 2001-PS-008	Field Observation Report: Post Accident Sampling System	February 22, 2001

3PPX Physical Protection

CPS 1701.58	Key and Core Control	September 8, 1998
CR 2-01-07-083	Unattended Weapon	July 9, 2001
CR 2-01-03-085	Unauthorized Unescorted Access	March 12, 2001
Department Monthly Self-Assessment Report	May 2001	June 21, 2001
Department Monthly Self-Assessment Report	April 2001	May 16, 2001
Nuclear Oversight Assessment	Security: Fitness-For-Duty	April 24, 2001
Nuclear Oversight Assessment	Security: Access Authorization	May 8, 2001
QA Field Observation Report 2000-61-008	Access Authorization Temporary Screening	October 23, 2000
Safeguards Event Log		October 2000 - June 2001

Safeguards Event Report		October 2000 - June 2001
Security Watch Tour #3	Monitoring Vehicle Access, Search and Escort	January - June 2001
Security Watch Tour #19	Monitoring Transfer Cage Searches	January - June 2001
Semi-Annual Fitness-For-Duty Report	Period Ending December 31, 2000	January 26, 2001
SY-AA-103-511 Revision 5	Request for Unescorted Access	
Wackenhut Self-Assessment Report (423856153)	Security Safeguards Inspection	May 18, 2001

4OA3 Event Follow-up

CPS 9538.03	FW [feedwater] Reactor Vessel Water Level C34-N004A(B,C) Channel Functional Revision 34c
CR 2-01-07-209	Reactor Scram During Performance of Surveillance Procedure 9538.03

Prompt Investigation Report generated in response to CR 2-01-07-209

CPS Post Trip Review Report Number 41 dated July 24, 2001

CPS 4100.01	Reactor Scram Revision 17