March 24, 2000

Mr. Michael T. Coyle
Vice President
Clinton Power Station
AmerGen Energy Company, LLC
Mail Code V-275
P. O. Box 678
Clinton, IL 61727

SUBJECT: CLINTON POWER STATION INSPECTION REPORT 50-461/2000001(DRP)

Dear Mr. Coyle:

On February 25, 2000, the NRC completed an inspection at the Clinton Power Station. The enclosed report presents the results of that inspection.

During the period covered by this inspection, your staff's conduct of activities at the Clinton facility was generally characterized by safety-focused operations. Effective preparations for adverse weather conditions resulted in your staff promptly responding to differential pressure problems associated with ventilation systems which draw air from the environment surrounding the plant. However, poor communications among maintenance workers led to an unplanned, unrecognized Technical Specification Limiting Condition for Operation entry for an inoperable control room ventilation system train. In addition, a licensed reactor operator did not notify control room supervision prior to conducting a minor reactivity manipulation. Your conduct of operations reactivity management guidance specifies that control room supervision should be notified of all significant reactivity manipulations. During their review of this event, your staff determined that control room supervision should be informed of all reactivity manipulations unless the manipulation is initiated solely for the purpose of maintaining steady state power levels.

Based on the results of this inspection, the NRC has determined that one violation of NRC requirements occurred. The violation involved a non-licensed operator failing to follow the instructions in a procedure when he started the "B" standby liquid control system pump instead of the "A" pump during surveillance testing. This violation is being treated as a Non-Cited Violation (NCV), consistent with Section VII.B.1.a of the Enforcement Policy. The NCV is described in the subject inspection report. If you contest the violation or the severity level of the NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region III, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's “Rules of Practice,” a copy of this letter, the enclosure, and your response, if you choose to respond, will be placed in the NRC Public Document Room.

Sincerely,

Original signed by
Marc L. Dapas, Deputy Director

Marc L. Dapas, Deputy Director
Division of Reactor Projects

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

Enclosure: Inspection Report 50-461/2000001(DRP)

cc w/encl: P. Hinnenkamp, Plant Manager
M. Reandeau, Director - Licensing
G. Rainey, Chief Executive Officer
R. Moore, Manager-Quality Assurance
M. Aguilar, Assistant Attorney General
G. Stramback, Regulatory Licensing
Services Project Manager
General Electric Company
Chairman, DeWitt County Board
State Liaison Officer
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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No:	50-461
License No:	NPF-62
Report No:	50-461/2000001(DRP)
Licensee:	AmerGen Energy Company
Facility:	Clinton Power Station
Location:	Route 54 West Clinton, IL 61727
Dates:	January 13 - February 25, 2000
Inspectors:	P. L. Louden, Senior Resident Inspector K. K. Stoedter, Resident Inspector C. E. Brown, Resident Inspector D. E. Zemel, Illinois Department of Nuclear Safety
Approved by:	Thomas J. Kozak, Chief Reactor Projects Branch 4 Division of Reactor Projects

EXECUTIVE SUMMARY

Clinton Power Station
NRC Inspection Report 50-461/2000001(DRP)

This inspection included aspects of licensee operations, maintenance, engineering and plant support. The report covers a 6-week period of resident inspection.

Operations

- Ineffective communications, self- and peer-checking techniques, and oversight resulted in operations personnel incorrectly starting the “B” standby liquid control system pump instead of the “A” pump during surveillance testing. One non-cited violation was identified regarding this event (Section O1.1).

- Poor communications among maintenance personnel resulted in an unplanned, unrecognized Technical Specification Limiting Condition for Operation entry for an inoperable control room ventilation system train (Section O1.2).

- Through effective preparations, the licensee promptly responded to ventilation system filter differential pressure problems caused by adverse weather conditions (Section O1.3).

- The inspectors concluded that a reactor operator’s failure to promptly inform control room supervision of a minor power increase and the subsequent reactivity manipulations initiated to restore power to 100 percent did not meet licensee conduct of operations expectations relative to reactivity management. (Section O4.1).

Maintenance

- The inspectors concluded that the potential existed to place the plant in a higher risk configuration due to poor communications from in-plant operators to the main control room regarding a problem with the makeup water treatment system (Section M2.1).

Plant Support

- The licensee conducted a fire drill to observe and assess a fire brigade’s readiness to respond to a fire in the plant. The fire brigade members participating in the drill effectively displayed the ability to respond, evaluate, and extinguish a simulated fire in the plant. A comprehensive critique of the drill performance was also conducted (Section F5.1).

Report Details

Summary of Plant Status

The plant remained at essentially 100 percent power during the inspection period. The plant staff reduced the power level to approximately 98 percent while troubleshooting reactor recirculation flow control valve problems on February 13 and 20, 2000.

I. Operations

O1 Conduct of Operations

O1.1 Inattention-to-Detail and Lack-of-Oversight Results in Incorrect Component Manipulation

a. Inspection Scope (61726 and 71707)

The inspectors reviewed the circumstances surrounding an operator starting the incorrect standby liquid control (SLC) system pump during a surveillance test.

b. Observations and Findings

On January 13, 2000, three non-licensed operators (NLOs) conducted surveillance testing on the SLC system pumps using the guidance in Procedure 9015.01, "Standby Liquid Control System Operability." The surveillance procedure directed the NLOs to test the "A" pump first followed by the "B" pump. Execution of this surveillance test placed the plant in an 8-hour Technical Specification (TS) Limiting Condition for Operation (LCO) and a risk level orange condition (core damage frequency (CDF) increased by more than 20 times the baseline CDF). Three NLOs were assigned to conduct the surveillance test, one as the test director, one as the assistant test director, and one to conduct peer-checking. A reactor operator (RO) in the main control room (MCR) was assigned to provide oversight of the test and to facilitate communications between the NLOs and personnel in the MCR.

Once the NLOs had completed the surveillance test prerequisites, the RO in the MCR gave the NLOs permission to start the test. The RO did not inform the control room supervisor (CRS) or the other MCR personnel of this instruction. Instead of starting the "A" pump as directed by the procedure, the test director mistakenly started the "B" pump. The test director assumed that the RO and CRS were aware that the "B" pump had been started instead of the "A" pump. After stopping the "B" pump, the test director contacted the CRS and requested permission to start the "A" pump. Since the CRS was unaware that an error in starting the SLC system pumps had been made, he granted permission to start the "A" pump. Licensee management expectations are to stabilize work activities and immediately address personnel errors after their discovery. Although the NLO was aware of these expectations, he assumed that the CRS was knowledgeable of the error but had decided to continue with the surveillance test so that the TS LCO and the condition of increased risk could be exited as quickly as possible.

Once the test was completed, the CRS became aware of the error based on communications with the test director.

The licensee determined that the test director's error was the result of incomplete communications and ineffective self-checking and peer-checking techniques. In addition, the MCR RO, the CRS, and the shift manager (SM) became distracted by other tasks and did not provide the level of oversight licensee management expected for this activity.

Technical Specification 5.4.1.a requires that written procedures be established, implemented, and maintained for the specific activities listed in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, dated February 1978. Section 8 of Appendix A to RG 1.33, lists surveillance testing as an activity requiring written procedures. Procedure 9015.01, "Standby Liquid Control System Operability," is a procedure for conducting the TS-required SLC system surveillance test. Procedure 9015.01 specifies that the SLC system surveillance test shall be conducted by first starting the "A" pump and then starting the "B" pump. Contrary to this procedural guidance, an NLO started the "B" pump first. This is considered a violation of TS 5.4.1.a. However, this Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Section VII.B.1.a of the NRC Enforcement Policy (NCV 50-461/2000001-01). This event is in the licensee's corrective action program as Condition Report (CR) 2-00-01-068.

c. Conclusions

Ineffective communications, self- and peer-checking techniques, and oversight resulted in operations personnel incorrectly starting the "B" standby liquid control system pump instead of the "A" pump during surveillance testing. One non-cited violation was identified regarding this event.

O1.2 Review of Control Room Ventilation Equipment Problems

a. Inspection Scope (62707 and 71707)

The inspectors reviewed activities associated with the licensee's evaluation of control room ventilation (VC) system "B" train equipment problems.

b. Observations and Findings

On January 11, 2000, the licensee identified that the "B" train of the VC system was degraded, in that, the "A" train VC system supply air backdraft dampers were partially open. This condition affected the ability of the "B" train to provide positive pressure in the MCR relative to adjacent areas. The licensee concluded, based on an operability determination conducted by engineering personnel, that the "B" train of the VC system was operable (capable of performing its safety function) but degraded.

In response to this issue, engineering personnel initiated minor maintenance action requests (ARs) to facilitate inspection and lubrication of the backdraft dampers for both trains of the VC system. Operations personnel informed day-shift maintenance

personnel that the inspection plates should not be removed during these work activities; however, this information was not communicated to maintenance personnel on following shifts.

Work activities associated with the minor maintenance ARs were completed on January 11 and 12, 2000. However, while conducting the work activities, the "A" train inspection plates had been removed which rendered the train inoperable. Operations personnel were unaware that the inspection plates had been removed and, therefore; the "A" train had not been declared inoperable. Although operations personnel were not aware that the VC "A" train of the system was inoperable, no violation occurred since the train was returned to an operable status within the TS allowed outage time.

c. Conclusions

Poor communications among maintenance personnel resulted in an unplanned, unrecognized Technical Specification Limiting Condition for Operation entry for an inoperable control room ventilation system train.

O1.3 Cold Weather Detrimental Effects on Plant Equipment

a. Inspection Scope (92700)

The inspectors reviewed the licensee's response to a change in weather conditions that had an adverse effect on plant equipment.

b. Observations and Findings

During periods of dense fog combined with cold temperatures, ventilation intake filters can be subject to high differential pressure due to the cold, moist air freezing on the filter media. This condition can render plant ventilation systems that have air intakes from the environment inoperable. Operations personnel described this phenomenon and listed the equipment which could be affected in Procedure 1860.01, "Cold Weather Operation." The licensee also pre-staged ventilation filters in the event adverse weather conditions developed requiring prompt response.

The subject adverse weather conditions existed during the morning of February 8, 2000. Air filter pressure alarms for the turbine building (VT), machine shop and radioactive waste building (VW) heating, ventilation, and air conditioning (HVAC) systems were received in the main control room. At 6:23 a.m., the VT system supply fans tripped due to high differential pressure. At 6:29 a.m., plant operators secured the VW system due to high filter differential pressure problems. By 6:39 a.m., the VT System was shut down. At 6:49 a.m., operators observed that the service air (SA) system compressor supply filter differential pressure was increasing. Operators started an alternate SA system compressor and shifted operating trains to avoid further SA system compressor problems. After sunrise, weather conditions improved before any additional licensee actions were necessary. Maintenance personnel replaced all saturated filters and operators returned the systems to normal operating status and alignment. Due to the

preparations for these conditions, plant personnel were able to effectively respond to this event.

c. Conclusions

Through effective preparations, the licensee promptly responded to ventilation system filter differential pressure problems caused by adverse weather conditions.

O4 Operator Knowledge and Performance

O4.1 Reactivity Manipulation Conducted Without Notifying Control Room Supervision

a. Inspection Scope (71707)

The inspectors reviewed the circumstances surrounding reactor operator actions taken in response to the unexpected opening of the “A” reactor recirculation (RR) system flow control valve (FCV) which resulted in a slight increase in reactor power.

b. Observations and Findings

On February 2, 2000, during a turnover briefing between the off-going swing shift RO and the oncoming midnight shift RO, the ROs noted that the 2-minute reactor power rolling average was greater than 100 percent. The off-going RO promptly reduced thermal power by adjusting RR system flow. The operators estimated that reactor power was 100.3 percent for a few minutes. The off-going RO did not inform the CRS that he had conducted a minor reactivity manipulation to reduce reactor power. The licensee’s conduct of operations reactivity management guidance specifies that significant reactivity manipulations are to be communicated to and observed by control room supervision. Upon reviewing this event, the licensee informed the inspectors that communication of reactivity manipulations is expected, independent of the magnitude of the manipulation, unless the manipulation is initiated solely for the purpose of maintaining steady state power levels.

Following the turnover briefing, the midnight shift RO documented the actions of the swing shift RO to address the reactor power increase and informed the CRS. The SM then conducted a crew briefing to discuss the event, expectations for reactivity manipulations, and actions to address the problem with the RR system FCV. This information was subsequently communicated to the other operations’ crews.

c. Conclusions

The inspectors concluded that an RO’s failure to promptly inform control room supervision of a minor power increase and the subsequent reactivity manipulations initiated to restore power to 100 percent did not meet licensee conduct of operations expections relative to reactivity management.

II. Maintenance

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Repetitive Makeup Water System Failures

a. Inspection Scope (37551, 61726, 71707)

The inspectors reviewed the licensee's actions in response to a repeat failure of the polymer mixing chamber in the makeup water treatment system on January 31, 2000.

b. Observations and Findings

The makeup water treatment system processes lake water into filtered water for use as seal water for the circulating water (CW) system and service water (WS) system pumps, and as the source for plant potable and pure water supplies. Although the CW system and WS system pumps can self-supply seal water, the licensee used clean filtered water to minimize seal degradation. A polymer is added to the lake water via a mixing chamber to aggregate suspended solids, thereby increasing filtration effectiveness. Without polymer addition, the quality of the filtered water rapidly degrades to the point that the licensee would either have to provide an alternate source of clean water or shut the plant down before the CW system and WS system pumps tripped on low water level in the filtered water storage tank.

On January 31, 2000, at about 8:30 a.m., a leak occurred in the mixing chamber. As a result, the level in the filtered water storage tank began to decrease. By the time the SM became aware of the leak, the filtered water inventory could support only a few more hours of full power operations. The licensee subsequently processed a temporary modification to restore the filtered water system. A new mixing chamber was installed in the system the next day.

On February 1, 2000, the licensee initiated CR 2-00-02-032, "Self-Assessment of Crew Performance in Response to Equipment Failure in the Makeup Water Pump House." From the self-assessment, the licensee determined that the failed mixing tank had been poorly communicated to the control room operators.

The makeup water system is not safety-related and is not scoped as a maintenance rule system. However, the inspectors determined that the licensee had not considered the impact of a makeup water system failure on plant risk until prompted by the inspectors. Through discussions with the plant risk analysts and an NRC senior reactor analyst, the inspectors determined that if the plant had to be shutdown to repair the makeup water system, plant risk would increase by a factor between 7 and 11 times the risk associated with steady state power operations. The licensee declares an increased risk condition (from green to yellow) when risk associated with plant operations increases by a factor of 2 and a high risk condition (orange) at an increase risk factor of 20.

c. Conclusions

The inspectors concluded that the potential existed to place the plant in a higher risk configuration due to poor communications from in plant operators to the MCR regarding a problem with the makeup water treatment system.

III. Engineering

E4 Engineering Staff Knowledge and Performance

The inspectors observed that engineering personnel provided effective analyses and problem evaluations during investigations into the RR system FCV problems. The resolution of the FCV problems was well coordinated between the operations, maintenance, and engineering departments.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

The inspectors observed during routine plant tours that radiological control postings and labels were established in compliance with 10 CFR Part 20 requirements. Contaminated areas in safety system pump rooms were kept to a minimum to allow operators easy access to system components.

F5 Fire Protection Staff Training and Qualification

F5.1 Observation of Fire Brigade Drill (71750)

The inspectors observed a fire brigade drill on January 28, 2000. Fire brigade members responded to the simulated fire promptly and communicated clearly to MCR operators. The SM, the CRS, and the “B” RO each had a trainee assigned during the drill. The training aspects of the drill were well organized in that each trainee had to interact with other members of the operations crew to complete the drill. In particular, the trainee SM recognized that the “B” RO trainee was not speaking loudly enough for all of the operating crew to hear. The trainee SM corrected the poor communication practice and directed the “B” RO to hold a status briefing for the control room operators. The licensed operators maintained close control over the actions of the trainees and ensured that the trainees used procedures correctly. The licensee held a comprehensive critique of drill performance.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on February 25, 2000. 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.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

G. Baker, Manager - Nuclear Support Services
M. Coyle, Vice President
K. Gallogly, Director - Corrective Action
P. Hinnenkamp, Plant Manager - Clinton Power Station
W. Maguire, Director - Operations
M. Reandeau, Director - Licensing
R. Schenck, Manager - Maintenance
P. Walsh, Manager, Nuclear Station Engineering
E. Wrigley, Director, Quality Assurance

INSPECTION PROCEDURES USED

IP 37551:	Engineering Observations
IP 61726:	Surveillance Observations
IP 62707:	Maintenance Observation
IP 71707:	`Plant Operations
IP 71750:	Plant Support and Observations
IP 92700:	Onsite Followup of Written Reports of Nonroutine Events at Power Reactor Facilities
IP 92903:	Followup - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-461/2000001-01	NCV	Failure to follow procedures regarding a SLC system surveillance test.

Closed

50-461/2000001-01	NCV	Failure to follow procedures regarding a SLC system surveillance test.

Discussed

None

LIST OF ACRONYMS

AR	Action Request
CR	Condition Report
CRS	Control Room Supervisor
CW	Circulating Water
FCV	Flow Control Valve
FIN	Fix-It-Now
HVAC	Heating, Ventilating and Air Conditioning
LCO	Limiting Condition for Operation
MCR	Main Control Room
MWPH	Make Up Water Pump House
NLOs	Non-licensed Operators
RCIC	Reactor Core Isolation Cooling
RG	Regulatory Guide
RO	Reactor Operator
SA	Service Air
SLC	Standby Liquid Control
SM	Shift Manager
TS	Technical Specification
VF	Fuel Building HVAC
VJ	Machine Shop HVAC
VT	Turbine Building HVAC
VW	Radioactive Waste Building
WS	Service Water