U.S. NUCLEAR REGULATORY COMMISSION

REGION III

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Report No:	50-461/97025(DRP)
Licensee:	Illinois Power Company
Facility:	Clinton Power Station
Location:	Route 54 West Clinton, IL 61727
Dates:	November 25, 1997 - January 22, 1998
Inspectors:	T. W. Pruett, Senior Resident Inspector K. K. Stoedter, Resident Inspector K. N. Selburg, Radiation Specialist D. E. Zemel, Illinois Department of Nuclear Safety
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EXECUTIVE SUMMARY

Clinton Power Station
NRC Inspection Report No. 50-461/97025(DRP)

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

Operations

- One violation was identified due to the failure to implement required Technical Specification actions to restore isolation capability to secondary containment penetrations between October 18 and December 16. Additionally, on-shift operations personnel were unfamiliar with how to implement licensing department guidance on acceptable administrative controls associated with Technical Specification 3.5.2.D.3. (Section O1.1.b.1)

- One violation was identified due to the failure to implement required Technical Specification actions to restore either the Division I or II inverter to service. Specifically, operations personnel failed to recognize that declaring all 480VAC motors inoperable required an entry into Technical Specification 3.8.8, "Inverters-Shutdown." (Section 01.1.b.2)

- Fourteen examples of the failure of operations personnel to implement the Technical Specifications since January 1996 were identified by NRC inspectors and/or the licensee. The multiple failures represent a weakness in the ability to implement the requirements of the Technical Specifications and a poor awareness of plant conditions which impact Technical Specification requirements. (Section O1.1.b.3)

- The decision to continue work even though three out of four source range monitors (SRMs) were exhibiting unexpected responses indicated a poor awareness of conditions with the potential to impact Technical Specifications, and was an example of a poor questioning attitude and oversight of maintenance activities by operations personnel. (Section O1.1.b.4)

- A 13-day delay in restoring SRMs to an operable status was an example of poor awareness of plant conditions and a lack of operations personnel involvement in restoring Technical Specification equipment to a fully operable status. The avoidable delay in restoration resulted in an unnecessary entry into plant Technical Specification 3.3.1.2, "Source Range Monitor Instrumentation." (Section O1.1.b.5)

- Implementation of Technical Specifications for SRM channel functional testing was poor in that operations personnel were unable to initially explain the basis which allowed transfer of the reactor mode switch from shutdown to run. Additionally, operations personnel did not document the applicable Special Operation Technical Specification which allowed the deviation from the requirements of Technical Specification 3.3.1.2 prior to manipulating the reactor mode switch. (Section O1.1.b.5)

- The failure to notice or provide a reason for the abnormally low cooling water inlet and outlet temperature indication associated with Residual Heat Removal (RHR) Heat

Exchanger A following a transfer of shutdown cooling was an example of poor awareness of plant indications by operations personnel in the main control room. (Section O1.1.b.6)

- The failure to notice or provide a reason for the abnormal vent valve position indication associated with RHR Heat Exchanger A was an example of poor awareness of plant indications by operations personnel in the main control room. (Section O1.1.b.7)

- The inability to explain the status of the normally operating fuel building ventilation system was an example of poor awareness of plant conditions by operations personnel. (Section O1.1.b.8)

- Several deficiencies were identified involving the operations mode restraint tracking system, which included: condition reports and engineering evaluations which were not identified as mode restraints; condition reports and engineering evaluations which were classified as mode restraints but not tracked on a mode restraint list; ineffective implementation of corrective actions for previously identified mode restraint issues; and multiple departmental tracking systems for mode restraints. (Section O1.2)

- During the transfer of shutdown cooling from RHR Train B to RHR Train A, operations personnel appropriately referenced procedures, acknowledged annunciators, and performed the transfer without any significant complications. (Section O1.3)

- An auxiliary operator was knowledgeable of systems and provided good responses to questions during a tour of the containment, fuel, control, and auxiliary buildings. (Section O1.4)

Several discrepancies were noted during a walkdown of the alternate source of control room ventilation including: incorrect revisions of procedures, an uncontrolled vendor manual, and a lack of implementation of vendor recommended preventive maintenance items. (Section O2.1)

Maintenance

- Maintenance personnel demonstrated good procedure usage during functional testing of the Division III 4.16 KV Bus under voltage relay in that they reviewed each step prior to performance, exhibited good independent verification techniques, were aware of the purpose of the surveillance test, and understood problems which could be encountered if the surveillance was not successfully completed. (Section M1.2)

- Maintenance personnel did not effectively plan work activities for the initial 480VAC motor inspections in that work began on the Shutdown Service Water (SSW) Pump Room A Supply Fan motor without having the appropriate parts on site, without having all parts approved through an accredited quality assurance program, and without having a method for greasing the motor bearings prior to installation. (Section M1.4)

- One example of a non-cited violation was identified for the failure to follow procedures involving the installation of an isolation transformer during testing of SRMs. Two examples of a poor questioning attitude were identified which involved the continuance of a maintenance activity even though there was an unexplained increase in test parameters and an unexplained increase in main control room SRM indications. (Section M1.5)

- An audit conducted by quality assurance involving receipt inspections and shelf life determinations identified several weaknesses in the material management program and represented a continued improvement in the quality assurance organization's ability to perform thorough evaluations. (Section M7.1)

Plant Support

- One example of an individual incorrectly processing through a PCM-1B was identified. (Section R4.1)

- No deficiencies were noted during a lighting tour of the protected area. (Section S2.1)

Report Details

Summary of Plant Status

The plant remained shut down during the inspection period. Major activities included the removal of silt from the service water intake structures, a Division II electrical bus outage, and the initiation of team assignments for the licensee's Plan For Excellence. On January 5, 1998, the licensee announced that a three-year contract had been signed, which would allow the facility to be managed by PECO Nuclear, a division of PECO Energy Company of Philadelphia.

I. Operations

01 Conduct of Operations

O1.1 Operators' Awareness of Plant Conditions and Technical Specifications

a. Inspection Scope (71707)

The inspectors performed frequent observations of control room activities and questioned operations personnel on the status of plant equipment, indications, and Technical Specifications (TS).

b. Observations and Findings

Several examples of poor awareness of TS entry conditions or plant conditions by operations personnel were identified which involved the failure to verify that automatic containment isolation signals were operable, the automatic transfer of the Division II inverter, the impact of Source Range Monitor (SRM) Channel A maintenance on SRM Channels B, C, and D, the performance of SRM channel functional testing, low cooling water inlet and outlet temperature indications on RHR Heat Exchanger A, incorrect valve position indication on RHR Heat Exchanger Vent Valves E12-R609B and E12-R608A, and the status of the Fuel Building Ventilation (VF) system.

b.1 **Failure to Maintain Containment Isolation Signal Operable**

Technical Specification 3.5.2, Required Action D.3, specified that actions be initiated to restore isolation capability in each secondary containment and secondary containment bypass penetration flow path that was not isolated. The Bases for TS 3.5.2 stated that secondary containment penetration isolation capability must be ensured by verifying at least one isolation valve and associated instrumentation are OPERABLE or other acceptable administrative controls are in place to assure isolation capability for each effected penetration. A description of what constitutes "other acceptable administrative controls" was not provided in the TS Bases.

On November 26, due to the inability to maintain at least one isolation valve operable for each effected penetration, licensing personnel provided the operations department with a letter which specified the steps necessary to comply with "other acceptable administrative controls," pursuant to TS 3.5.2.D.3 Bases. The letter required that operations personnel:

1. Maintain a list of secondary containment penetrations that remain open,

2. Identify which of these penetrations are auto-closed upon receipt of an isolation signal, and

3. In the event of an auto-isolation signal, monitor the response of these valves and take manual action to isolate any penetrations that fail to close.

On December 17, the inspectors verified that a list of effected secondary containment penetrations had been developed which identified those penetrations that auto-closed upon receipt of an isolation signal. The inspectors questioned on shift operations personnel to determine which auto-isolation signals were required to be operable (e.g., all secondary containment auto isolation signals or those isolation signals which pertained to the valves being left open). The individuals questioned were not familiar with the auto-isolation signals which were required to be operable in order to comply with the requirements for other administrative controls. The inspectors considered the unfamiliarity with implementation of other acceptable administrative controls associated with TS 3.5.2.D.3 an example of a poor questioning attitude and poor implementation of the TS 3.5.2.D.3 requirements.

On December 18, after consultation with licensing personnel, operations personnel determined that circuits associated with core alterations, movement of irradiated fuel, and operations with a potential for draining the reactor vessel, which also provided an auto-isolation signal to secondary containment isolation valves that remained open, were required to be operable. Additionally, operations personnel informed the inspectors that a review of tests and surveillances for the associated auto-isolation circuits had been performed to ensure operability of the required circuits.

On December 19, the inspectors independently verified the auto-isolation instruments associated with valves which remained open and determined that the Containment Building Fuel Transfer Pool Ventilation Plenum Radiation - High instruments were inoperable because surveillance testing on Plant Radiation Monitors 1-RIX-PR008A, -B, -C, and -D were overdue. The 1-RIX-PR008 Monitors provided an auto-isolation signal to Secondary Containment Isolation Dampers 1VF04Y, "Fuel Building Supply Outboard Isolation," 1VF06Y, "Fuel Building Supply Inboard Isolation," 1VF07Y, "Fuel Building Exhaust Inboard Isolation Damper," and 1VF09Y, "Fuel Building Exhaust Outboard Isolation Damper." Consequently, the auto-isolation capability of Dampers 1VF04Y, -6Y, -Y, and -9Y were not maintained in accordance with the provisions establish for other administrative controls pursuant to TS 3.5.2.D.3.

The inspectors performed a review of plant conditions and determined that as of September 2, 1997, the licensee was required to maintain the auto-isolation circuitry for the 1-RIX-PR008 monitors operable. However, on October 18, operations personnel unknowingly allowed the surveillance testing on the 1-RIX-PR008 monitors to lapse (exceed the 1.25 frequency). On December 16, operations personnel closed Dampers 1VF04Y,- 6Y, -7Y, and -9Y in preparation for a Division II electrical bus outage. The 1-RIX-PR008 monitors were restored to an operable status on December 22, prior to reopening Dampers 1VF04Y, -6Y, -7Y, and -9Y. The failure to implement require

actions to restore isolation capability to secondary containment penetrations between October 18 and December 16, demonstrated a poor awareness of plant systems and is a violation of TS 3.5.2.D.3 (VIO 50-461/97025-01).

b.2 **Failure to Recognize TS Conditions for Inoperable Inverters**

On December 25, 1997, at 12:45 p.m., operations personnel received an annunciator due to the Division II Nuclear Steam Protection System Inverter transferring from its normal to its alternate power supply. Both operations and electrical maintenance personnel responded, but were unable to determine the cause of the inverter transfer. Subsequently, operations personnel considered the inverter inoperable.

On December 28, at 8:30 p.m., operations personnel made an entry into the main control room logs which specified that as of 4:00 p.m. on December 26, TS Limiting Condition for Operation (LCO) 3.8.8, "Inverters-Shutdown," was entered due to the Division I and II inverters being inoperable.

The inspectors questioned operations personnel to determine: (1) why the TS 3.8.8 entry condition was not noted on December 25, and (2) following identification on December 28, why didn't operations personnel specify the time of entry as 12:45 p.m. on December 25. Operations personnel stated that they initially believed the required actions to be taken in response to two inoperable inverters were adequately covered by TS 3.8.2, "AC Sources - Shutdown" and TS 3.8.10, "Distribution - Shutdown." In addition, multiple operating crews failed to recognize that the actions to be taken when the Division I and II inverters were inoperable were clearly delineated in TS 3.8.8. Operations personnel stated that the date and time of entry on December 28 had been based on recognition of the Division I inverter being inoperable and that they should have predated the LCO entry time to 12:45 p.m. on December 25.

On December 29, operations personnel informed the inspectors that the Division I inverter was inoperable because the 480VAC motor which supplied power to the inverter room cooler was out of service due to motor over greasing concerns. The inspectors questioned operations personnel to determine why TS 3.8.8 had not been entered on November 8, 1997, when the 480VAC motors for both the Division I and II inverter room coolers were out of service since the inoperable room coolers resulted in both inverters being inoperable. After reviewing TS and other associated documentation, operations personnel determined that they had missed entry into TS 3.8.8 when the 480VAC motors for the inverter room coolers were declared inoperable on November 8. As a result, the required actions for TS 3.8.8 were not performed until 50 days after the inverters were initially inoperable. The failure to recognize an entry into a condition prohibited by TS demonstrated a poor awareness and questioning attitude by operations personnel.

Technical Specification 3.8.8, Inverters - Shutdown, requires, in part, that one divisional inverter capable of supplying one division of the Division I or II onsite Class 1E uninterruptible AC bus electrical power distribution subsystems required by LCO 3.8.10, "Distribution Systems - Shutdown," shall be operable. With one or more required divisional inverters inoperable, the LCO requires that actions be initiated to declare the affected required features inoperable immediately or suspend core alterations, suspend handling of irradiated fuel assemblies in primary and secondary containment, suspend operations with the potential to drain the vessel, and initiate actions to restore required

divisional inverters to an operable status immediately. The inspectors determined that the failure to implement the Required Actions of the associated Conditions for approximately 50 days a violation of TS 3.8.8 **(VIO 50-461/97025-02)**.

b.3 **Adverse Trend Involving Implementation of TS**

The inspectors noted that there have been multiple examples described in NRC inspection reports and Licensee Event Reports (LER) which involved inadequate implementation of the TS. The following examples were previously noted by the inspectors between the period of January 1996 and December 1997:

NRC Report 50-461/97022:	Two examples of the failure to implement TS Required Actions involving immediate actions and alternate shut down cooling.
NRC Report 50-461/97015:	One example involving the installation of a non qualified portable battery charger to the Division II Battery.
NRC Report 50-461/96006:	Two examples involving the plant not being placed in MODE 4 and not locking the mode switch in the refuel position.
NRC Report 50-461/96005:	Two examples involving control room ventilation and reactor water cleanup room floor plugs.
LER 50-461/97011:	One example involving the failure to verify breaker position every seven days.
LER 50-461/97007:	One example involving seismic qualification of circuit breakers.
LER 50-461/97002:	One example involving EDG testing.
LER 50-461/96019:	One example involving surveillance testing of SRMs.
LER 50-461/96003:	One example involving a breach of secondary containment.

The inspectors noted that the multiple examples of inadequate TS implementation was an adverse condition which the licensee had not previously recognized. On January 5, 1998, the inspectors discussed the TS deficiencies with senior licensee personnel. In response to the inspectors' concern, the licensee initiated condition report (CR) 1-98-01-059 on January 7, 1998, to document an adverse trend in TS awareness and implementation. The Assistant Plant Manager - Operations stated that emergent training on TS, a review of existing TS applicable to the plant conditions, and discussions with shift supervisors would be performed as an interim measure until a more thorough review could be initiated.

b.4 **Maintenance on SRM Channel A**

On December 2, 1997, during preventive maintenance to perform current to voltage (I/V) plots on SRM Channel A, the SRM Channel B, C, and D count rate increased and a short period alarm annunciated in the main control room. Operations personnel questioned control and instrumentation (C&I) personnel to determine if the maintenance activity caused the unexpected increase in count rates. C&I responded that they were not the cause of the increased counts and resumed work.

Upon resumption of the maintenance activity operations personnel observed a second increase in count rate on SRM Channels B, C, and D. Once again operations personnel questioned C&I personnel regarding the impact of the SRM A activity on SRMs B, C, and D. Again, C&I responded that they did not believe they were responsible, but recommended that the test voltage be adjusted a third time on SRM A to check the response on SRMs B, C, and D. As the test voltage was raised, operations personnel noted an increase in the count rate on SRM Channels B, C, and D. Following the third unexpected and unexplained increase in count rate, operations personnel directed that C&I stop the work activity on SRM Channel A. The inspectors considered the delay in work stoppage until a third unexpected response occurred an example of poor questioning attitude and oversight of maintenance activities by operations personnel.

On December 3, the inspectors questioned operations personnel to determine the applicability of SRM TS. Operations personnel stated that SRMs B, C, and D were operable since the maintenance activity on SRM Channel A had been stopped. The inspectors questioned operations and engineering personnel to determine if the operability review assessed whether or not adequate separation existed between the SRM channels, given the unexpected and unexplained response on SRM Channels B, C, and D. Engineering personnel discussed the issue with the vendor and were unable to determine if adequate separation existed between the SRM Channels. Because the response to SRM Channels B, C, and D was unexpected, and because engineering was unable to determine if adequate separation existed between SRM Channels, operations personnel declared all four channels of SRM inoperable and verified the required actions of TS 3.3.1.2, "Source Range Monitor Instrumentation."

On December 10, engineering personnel completed an evaluation of the unexpected response on SRMs B, C, and D, and determined that the event was related to noise generation created due to the setting of the discriminator threshold level and improper isolation of the 120 Vac power supply to the measuring and test equipment (See Section M1.5). Even though the licensee eventually demonstrated that adequate separation existed between the SRM channels, the inspectors considered the lack of recognition of conditions with the potential to impact TS an example of poor awareness and questioning attitude by operations personnel.

b.5 **Channel Functional Testing of SRMs**

On December 22, 1997, SRM Channels A, B, and C were inoperable and operations personnel were implementing the required actions of TS 3.3.1.2 which specified that with less than two operable SRM channels, fully insert all insertable control rods and place the reactor mode switch in the shutdown position. SRM A was considered inoperable because operations personnel had allowed the channel functional test to lapse on

December 10. SRM B was considered inoperable because operations personnel had not completed post maintenance testing following maintenance completed on December 15. SRM C was considered inoperable on December 22, due to unexplained intermittent spiking. Prior to December 22, SRM C had been placed on the main control room deficiency list due to intermittent spiking.

The licensee initially attempted to restore SRM C to service on December 23, prior to performing testing on the remaining SRMs. However, trouble shooting activities on SRM C were unsuccessful, and operations personnel decided to complete channel functional testing on SRMs A, B, and D.

The inspectors questioned operations personnel to determine: (1) why testing had been deferred to the point that an unnecessary entry into TS 3.3.1.2 was required, and (2) why reliance was placed on a suspect monitor to meet the TS 3.3.1.2 requirements for two operable SRMs. Operations personnel stated that a lack of operations involvement in the scheduling process resulted in an unacceptable delay in restoring SRMs to service in a timely manner. The inspectors considered the delay in restoring the SRMs to operable status an example of poor awareness of plant conditions and a lack of operations involvement in restoring TS equipment to a fully operable status.

During a review of the December 23 station logs, the inspectors noted a log entry at 12:35 p.m. which specified that SRM channel functional testing had commenced, that all rods were inserted, and that there were no core alterations in progress. The inspectors noted that SRM channel functional testing required that the reactor mode switch be placed in the run position, which was contrary to the TS 3.3.1.2 required action to maintain the reactor mode switch in the shut down position.

The inspectors questioned on shift operations personnel to determine why it was acceptable to transfer the reactor mode switch from the required position. Operations personnel involved in the SRM channel functional testing were initially unable to explain the rational for transferring the reactor mode switch. Upon further review, operations personnel stated that the actions taken were consistent with implementation of Special Operations TS 3.10.2, "Reactor Mode Switch Interlock Testing," which allows transfer of the reactor mode switch to other positions to allow testing provided all control rods remain fully inserted in core cells containing one or more fuel assemblies; and no core alterations are in progress.

The inspectors noted that the station logs indicated that the control rods were fully inserted and that no core alterations were in progress. However, no entry had been made specifying that the provisions of TS 3.10.2 were being invoked in order to perform testing. Operations personnel acknowledged that an entry in the station log should have been made which specified the applicable TS being utilized for the plant condition. The inspectors determined that implementation of the TS for SRM channel functional testing by operations personnel was poor in that they were unable to initially explain the basis which allowed transfer of the reactor mode switch and because operations personnel did not document the applicable TS prior to manipulating the reactor mode switch.

b.6 Cooling Water Temperature Indication for Residual Heat Removal Heat Exchanger

On December 17, following the transfer from RHR B to RHR A, the inspectors noted that the cooling water inlet and outlet temperature indications for RHR Heat Exchanger A were pegged low. On shift operations personnel questioned by the inspectors had not noticed the abnormal indication and were unable to provide an explanation for the low reading. Operations personnel stated that the temperature indicators were typically not used since a separate instrument for the parameter was normally referenced. The inspectors considered the failure to notice or provide a reason for the abnormally low indication an example of poor awareness of plant indications.

Approximately 30 minutes later, during subsequent discussions with operations personnel, a reactor operator recalled that the outlet temperature indicator may have been a main control room deficiency. Through a search of MWR tags in a storage bin in the control room and a review of the MWR database, the on shift operators were able to locate documentation which described the deficiency on the outlet temperature indication. The inlet temperature indication did not have a separate deficiency tag but was described in the remarks section of the MWR database for the outlet temperature indication. The inspectors noted that nothing existed on the control room panel to prompt the operators of a main control room deficiency and a log of main control deficiencies was not maintained in the control room (See Section O2.1).

b.7 RHR Heat Exchanger Vent Valve Position Indication

The inspectors questioned operations personnel to determine why the main control room valve position indication for RHR Heat Exchanger Vent Valves E12-R609B, and E12-R608A did not indicate full closed even though the valves were fully closed. E12-R609B indicated approximately 2 percent, and E12-R608A indicated approximately 5 percent open even though both valves were tagged in the fully closed position. Operations personnel stated that the valve indications are not utilized and therefore the discrepancy had not been noted or documented as a deficiency. The inspectors considered the lack of recognition of the inaccurate valve position indication an example of poor questioning attitude and awareness of plant systems by operations personnel.

b.8 Status of Fuel Building Ventilation System

On December 19, 1997, on shift operations personnel noted an increase in fuel building fire alarms due to the normal ventilation system being secured to support maintenance involving the Division II bus outage. The inspectors questioned on shift operations personnel to determine why the fuel building ventilation (VF) system was out of service and received different reasons.

The first individual stated that he was unsure why VF was inoperative but speculated that it was because sensing instruments powered from Division II were deenergized. The second individual stated that there was only one train of VF which was powered from Division II.

Upon further review, the inspectors determined that the in series VF system isolation dampers are powered from both Division I and II. Securing Division I or II electrical busses removes power from the dampers which actuate to the fail close position. The inspectors noted that Procedure CPS 3514.01C006, "Bus/Unit Sub Outages, 4160V Bus (1AP09E) Outage," required that the VF system be secured as a prerequisite. Nevertheless, the inspectors determined that inability of on shift operations personnel to explain the status of the normally operating VF system an example of poor awareness of plant conditions.

c. Conclusions

The inspectors identified that since January 1996, on at least 14 occasions, operations personnel failed to properly implement the TS. The multiple failures represent a weakness in the licensee's ability to properly implement the requirements of the TS and a poor of awareness of plant conditions which impact TS requirements.

Two violations involving the failure to implement the TS associated with secondary containment and inverters were identified. Additionally, several examples of a poor awareness of plant conditions and poor questioning attitude were identified, which involved the performance of maintenance and testing on SRMs, the status of control room indications for RHR heat exchanger temperature and valve position, and the operational status of the fuel building ventilation system.

O1.2 Tracking of Plant Mode Restraints

a. Inspection Scope (71707)

The inspectors reviewed the program for tracking mode restraints to ensure that all items had been entered into the mode change restraint list (MCRL) or other appropriate tracking method.

b. Observations and Findings

The inspectors determined that the means for tracking condition reports or maintenance work requests identified as mode restraints were inconsistent. In addition, multiple lists between the operations, planning, engineering, and corrective action program departments made retrievability and tracking of mode restraint items cumbersome. For example, at the inspector's request, the licensee identified at least 31 CRs which were classified as mode restraints but were not listed in the official MCRL. The inspectors were also unable to cross reference several items between the system status file, the MCRL, the shift supervisor restraint list, the corrective action review board restraint list, and the engineering list.

Because of the cumbersome process, the inspectors reviewed CR 1-97-05-024, "Failure to Properly Identify Mode Restraints," initiated May 2, 1997, to determine the status of corrective actions from previously identified deficiencies involving CRs which were either not identified as mode restraints or were not in a tracking system. During the review of the CR, the licensee noted that the informal processes were cumbersome, prone to human error, and that tools needed to be developed to effectively and efficiently track mode restraints. Examples of deficiencies included new mode restraints identified during

engineering reviews which were not communicated to operators, shift supervisors and shift resource managers, CRs which were incorrectly identified as not being a mode restraint, and engineering evaluations which identified mode restraints but were not specified on the MCRL.

Corrective actions included revisions to procedures to improve awareness of mode restraints and the development of a mode restraint database. During discussions with operations personnel, the inspectors were informed that the MCRL database was not utilized as the official restraint list because it was difficult to use and the information in the database did not include all of the mode restraints.

In response to the inspectors' observations, the licensee reinitiated an effort to improve the identification and tracking of mode restraints. Nevertheless, the inspectors considered the inability to implement actions to improve the cumbersome processes of tracking mode restraints an example of the licensee's continued inability to implement effective corrective actions. Improvements in the corrective action program are being reviewed as part of the NRC's oversight of improvement initiatives at the facility.

c. Conclusions

Several problems were identified involving the mode restraint tracking system which included: condition reports and engineering evaluations which were not identified as mode restraints, condition reports and engineering evaluations which were classified as mode restraints but not tracked on a mode restraint list. ineffective implementation of corrective actions for previously identified mode restraint issues, and multiple departmental tracking systems for mode restraints.

O1.3 Transfer of Shut Down Cooling Systems (71707)

On December 17, 1997, the inspectors observed control room operators transfer shutdown cooling from RHR Train B to RHR Train A. Operations personnel appropriately referenced procedures, acknowledged annunciators, and performed the transfer without any significant complications.

O1.4 Non Licensed Operator Tour (71707)

On January 6, 1998, the inspectors accompanied a non-licensed operator on tours of the containment, fuel, control, and auxiliary buildings during the performance of Procedure CPS 3800.02C001, "C-Area Daily Rounds." The auxiliary operator was knowledgeable of systems contained within the C-Area and provided good responses to questions asked by the inspectors involving equipment operation.

O2 Operational Status of Facilities and Equipment

O2.1 Walkdown of Backup Control Room Ventilation Fans

a. Inspection Scope (71707)

The inspectors performed a walkdown of the alternate source of main control room ventilation which is utilized in the event of a station blackout.

b. Observations and Findings

On December 3, 1997, the inspectors performed a walkdown of the alternate source of main control room ventilation. The alternate source requires the installation of prestaged gasoline powered fans and ducting and the repositioning of MCR doors in accordance with Procedure CPS 4200.01C001, "MCR Cooling During a SBO." The alternate ventilation source was originally required to maintain MCR temperature below 107°F at the end of a SBO event. However, during a subsequent engineering review in January 1996, the licensee determined that the alternate source would not be required and revised CPS Procedure 4200.01 to place gasoline powered fans in service only if temperature reaches 107°F.

The inspectors noted the following discrepancies during the walkdown: (1) the incorrect revision of Procedure 4200.01C002, "DC Load Shedding During a SBO" was located in the 800' Turbine Building locker, (2) an uncontrolled copy of the vendor manual for the gasoline engines was located in the 800' Turbine Building locker, and (3) the vendor preventive maintenance recommendations for the gasoline engine were not being implemented.

The licensee initiated CRs 1-97-12-087 and 1-97-12-114, replaced the incorrect revision of CPS Procedure 4200.01C002, and commenced a review of the vendor recommended preventive maintenance items. The inspectors noted that the discrepancies were typical of previous NRC findings and that corrective actions were been developed as part of several restart initiatives to address concerns with procedure quality, vendor manuals, and implementation of preventive maintenance items describe in technical manuals.

c. Conclusions

Several discrepancies were noted during a walkdown of the alternate source of control room ventilation including; incorrect revisions of procedures, uncontrolled vendor manuals, and a lack of implementation of vendor recommended preventive maintenance items.

II. Maintenance

M1 Conduct of Maintenance

M1.1 General Comments (62707 and 61726)

The inspectors observed or reviewed the following maintenance and surveillance activities:

CPS Procedure [illegible]3.40	Division III 4.16 KV Bus Under Voltage Relay (Degraded Voltage) Functional Test"
CPS Procedure [illegible].12	Neutron Monitor Detector testing
CPS Procedure 9061.03	VR/VQ Valve Operability

Various MWRs Involving 480 VAC Motor Inspections

M1.2 Division III 4.16 KV Bus Under Voltage Relay (Degraded Voltage) Functional Test (61726)

The inspectors observed the Division III 4.16 KV Bus under voltage relay functional test and concluded that maintenance personnel demonstrated good procedure usage in that they reviewed each step prior to performance, exhibited good independent verification techniques, were aware of the purpose of the surveillance test, and understood problems which could be encountered if the surveillance was not successfully completed.

M1.3 Fix-It-Now Team

a. Inspection Scope (62707)

The inspectors reviewed the licensee's implementation of the Fix-It-Now (FIN) process. This included a review of applicable procedures and the Updated Safety Analysis Report (USAR), interviews with various FIN team members, and observations of work performed by the FIN team. The FIN team consisted of personnel from Operations, Clerical, Maintenance Planning, Radiation Protection, Control and Instrumentation, Electrical Maintenance, and Mechanical Maintenance departments.

b. Observations and Findings

The licensee implemented the FIN team in accordance with CPS Procedure 1029.03, "Implementation of the FIN Process." One difference between the FIN team process and the description in the procedure involved the experience of the FIN team leader (FTL). CPS Procedure 1029.03 required the FTL to have experience as an on-shift senior reactor operator, however, the current FTL had no such experience. The licensee had submitted a request for a procedure change, however, the procedure revision had not occurred since there was also a USAR change pending which regarded the FIN team. The USAR stated that the FTL would report to the maintenance planning supervisor. The USAR change would remove the responsibilities of FIN team oversight from the

maintenance planning supervisor and add them to the maintenance improvement team leader. Once this change request was accepted, the procedure could be updated, and the FIN team would be adequately described in licensee documents. The inspectors verified that the licensee had submitted the appropriate revisions.

c. Conclusions

The FIN team's work process was in accordance with licensee procedures.

M1.4 480 Volt Motor Inspections

a. Inspection Scope (62707)

The inspectors reviewed the licensee's plans and implementation of the plans for 480VAC motor removal, inspection, and reinstallation. The inspectors interviewed various personnel involved with the planning and implementation of these activities, reviewed various documents, and performed inspections of some of the motors after they had been disassembled.

b. Observations and Findings

On November 8, 1997, the operations department declared all 480VAC motors inoperable when they determined that the motors could be degraded due to potential over greasing during maintenance activities. Excessive grease on the motor windings could result in motor damage from heat degradation. The licensee decided that 96 480V motors would be inspected for signs of over greasing. The scope of these inspections included disassembly, inspection, cleaning of each motor, replacing the bearings, and reinstalling the motor.

On November 21, the licensee initiated work on the first motor, 1VH01CA (Shutdown Service Water Pump Room A Supply Fan) on an "at risk" basis. The licensee considered the activity to be "at risk" because several issues necessary to support motor reassembly had not been resolved. Specifically, replacement bearings had not been received, the bearing supplier did not have an approved quality assurance program, and the initial lubrication method had not been established. The bearing parts were received on November 24, the review of the bearing suppliers QA program was completed on December 1, and the initial lubrication method was approved on December 5.

The inspectors were concerned that the licensee started work on a component without having appropriate reassembly instructions or the necessary parts. The inspectors considered the licensee's decision to begin work on equipment needed to support availability of the Division I Shutdown Service Water Pump without having appropriate instructions or the necessary parts an example of non-conservative decision making. The inspectors noted that a delay in reassembly of the motor and restoring the pump to an operable status would have occurred had it not been for the identification of discrepancies requiring shipment of the motor to the vendor for inspection.

c. Conclusions

The inspectors noted that the licensee had not effectively planned work activities for the initial 480 volt motor inspection. Specifically, the licensee began work on the 1VH01CA motor without having the appropriate parts on site, without having all parts aporoved through an accredited quality assurance program, and without having a method for greasing the motor bearings prior to installation.

M1.5 SRM Current to Voltage Testing

a. Inspection Scope (62707)

The inspectors reviewed the results of C&I maintenance activities on SRM A performed in accordance with CPS Procedure 8731.12, "Neutron Monitoring Detector Testing."

b. Observations and Findings

On December 2, 1997, during the performance of current to voltage (I/V) testing on SRM A, C&I technicians stopped work to rearrange measuring and test equipment (M&TE). The last measurement taken prior to rearranging the test equipment was an input voltage of 300V, output voltage of 12mV, and output amperage 0.12 microamps.

The C&I technicians unknowingly reconnected the test meter to a 120VAC power supply without installing an isolation transformer. The isolation transformer is used when connecting to an AC source to prevent ground noise from impacting the test results. The first measurement taken after resuming testing indicated an approximate 50 fold increase (with an input voltage of 450, the output voltage was 575mV, and output amperage was 5.5 microamps). The C&I technicians performing the test did not question the significant rise in parameters and as such, did not note that the M&TE was improperly installed. The inspectors determined that the C&I technicians demonstrated a poor questioning attitude by not determining the cause of the significant increase in parameters following the resumption of the maintenance activity. The inspectors noted that the licensee did not question the significant rise in parameters during their review of the event.

When the C&I technicians raised the input voltage to 1000V, the control room indication for SRMs B, C, and D increased causing a short period alarm. The C&I technicians responded that they were not the cause of the short period alarm when questioned by operations and resumed testing. The C&I technicians increased voltage a second time and once again, the short period alarm annunciated in the main control room. The C&I technicians responded that they did not believe they were responsible and had operations personnel monitor SRM indication while they increased the input voltage a third time. Once again, SRM indication increased. Following the third increase operators directed that C&I technicians cease the maintenance activity. The inspectors determined that the C&I technicians demonstrated a second example of a poor questioning attitude by not determining the cause of the increase in SRM B, C, and D, indications prior to resuming the maintenance activity.

On December 12, engineering personnel determined that the increase in indication on SRMs B, C, and D was attributed to the failure to install an isolation transformer between the test meter and the 120VAC power supply. The lack of the isolation transformer allowed noise generation from the ground path to be radiated from the unshielded portions of the SRM A detector cable to the other unshielded SRM detector cables.

CPS Procedure 8713.12, Section 8.3.3, "I/V Plot for SRMs," requires, in part, that an isolation transformer be used if the test meter is powered from an AC source. The failure to install the isolation transformer when connecting the test meter to a AC source is considered a violation of TS 5.4.1. This licensee identified and corrected violation is being treated as a non-cited violation consistent with Section VII.B.1 of the NRC Enforcement Policy (NCV **50-461/97025-03**).

c. Conclusions

One example of a failure to follow procedures involving the installation of an isolation transformer during testing of SRMs was identified. Two examples of a poor questioning attitude were identified which involved the continuance of a maintenance activity even though there was an unexplained increase in test parameters and an unexplained increase in main control room SRM indications.

M7 Quality Assurance in Maintenance Activities

M7.1 Material Management and Procurement/Materials Quality Assurance Audit (62707)

The licensee's quality assurance department performed an audit (Q38-97-15) of the Material Management department and the Procurement/Materials department from October 20, through November 7, 1997. The inspectors noted that Quality Assurance (QA) performed a thorough audit based on findings involving inadequacies in the receipt inspection process and shelf life determinations. The inspectors determined that the audit findings were indicative of improved performance in QA audits.

M8 Miscellaneous Maintenance Issues (92902)

M8.1 (Closed) Licensee Event Report No. 50-461/96-008: Loose terminal connection causes reactor recirculation pumps to trip from fast to slow resulting in a manual scram. On June 13, 1996, control room operators received alarms indicating that both reactor recirculation (RR) pumps had downshifted to slow speed due to sensing a false Level 3 signal on two RR low level trip units. The licensee initially developed corrective actions to install special lugs at certain terminal points to allow easy installation of temporary electrical test equipment. After further investigation, the licensee changed the corrective actions to a revision of preventive maintenance work documents and briefings to maintenance personnel. The inspectors considered the corrective actions appropriate for this issue.

M8.2 (Closed) Notice of Violation No. 50-461/97011-08: Failure to complete an impact matrix. On May 14, 1997, a C&I technician improperly lifted the leads between terminals associated with the feedwater low trip unit and caused an unexpected run back of the "A" RR flow control valve. The licensee evaluated the task, technical specification surveillance procedures, and other PM tasks for systems which could significantly impact

plant operations. These procedures were annotated with warning statements which indicated the impact on plant systems should steps in the procedure be deviated. Training was performed for C&I technicians to ensure they understood the importance of procedure adherence. Finally, the licensee installed electrical test and monitoring equipment on certain electrical terminal points to ease the completion of preventive maintenance. Th inspectors considered the corrective actions appropriate for this issue.

M8.3 (Closed) Licensee Event Report 97013-00: Failure to adequately verify no trips exist during surveillance test results in inadvertent actuation of standby gas treatment system. On May 8, 1997, operations and maintenance personnel failed to establish and verify that plant protective logic was in the appropriate condition, resulting in an inadvertent actuation of the standby gas treatment system during a channel functional test of process radiation Monitor PR006A. Corrective actions included revisions to plant procedures to require notifications to supervision if incorrect switch positions were observed and to improve procedure clarity. The inspectors determined that the corrective actions were appropriate for this issue.

M8.4 (Closed) Notice of Violation No. 50-461/97011-06: This violation was closed during review of LER 97013.

M8.5 (Closed) Notice of Violation No. 50-461/96009-07: Untimely Completion of Use History Analysis (UHA). The inspectors reviewed Procedure CPS No. 1512.01, "Calibration and Control of Measuring and Test Equipment," and determined that the licensee had incorporated the criterion to generate a condition report for any UHAs which are not generated in 21 days. A report of UHA's status was compiled weekly by a C&I technician, with a copy provided to the C&I group leader for review. The inspectors reviewed UHAs which were required to be completed from January through November 1997, and noted that the majority of the UHAs were completed within 21 days, and those which were not completed were documented in a condition report.

Quarterly assessments of UHAs were performed by C&I technicians. These assessments constituted internal audits of the measurement and test equipment (M&TE) program, including a minimum requirement to review completed UHA forms for accuracy and completeness and to review a sample of completed MWRs for proper documentation and M&TE usage. From these units, the licensee determined whether a supervisory evaluation or a condition report needs to be issued. The inspectors considered the corrective actions appropriate for this issue.

M8.6 (Closed) Notice of Violation No. 50-461/97011-09: Preconditioning of breakers. The inspectors verified that procedures had been revised to ensure that field installed molded case circuit breakers are not preconditioned prior to functional testing. The inspectors considered the corrective actions appropriate for this issue.

III. Engineering

E8 Miscellaneous Engineering Issues

E8.1 (Closed) Notice of Violation No. 50-461/95003-01a: Failure of Division III Emergency Diesel Generator Bearing Due to Inadequate Lubrication. As part of the licensee's corrective actions to prevent recurrence, Plant Manager's Standing Order (PMSO) - 078, "Plant Component Oil Consumption," was developed to track oil consumption for permanent plant components between scheduled maintenance intervals to ensure that any chronic oil leaks or excessive oil consumption were identified and tracked.

The inspectors reviewed the implementation of PMSO-078 and determined that current practices for tracking and trending oil consumption were not meeting the intent of the corrective action. For example, PMSO-078 directs that an oil consumption form be completed any time oil is added to a plant component outside of a scheduled maintenance interval. The inspectors interviewed engineering and maintenance personnel and determined that the oil consumption forms were only being utilized by the operations department. Although maintenance personnel were allowed to add oil to plant components outside of a scheduled maintenance interval, they used a MWR or activated a PM task to perform the oil addition. Due to the maintenance department's use of MWRs and PMs to add oil, the oil consumption form included in PMSO-078 was not completed. Engineering personnel stated that they were unsure how oil added via a PM or MWR was tracked but believed that the system engineers tracked the performance or PMs and MWRs for their respective systems.

The inspectors were concerned that having two means of tracking oil consumption which were not all inclusive could result in the mis-identification of a chronic oil leak or excessive oil consumption. The inspectors discussed their concern with licensee management and were informed that changes would be made to ensure that any addition of oil to a component would be tracked to verify there was not an increase in oil consumption. Deficiencies in the licensee's equipment trending program have been identified in previous NRC Inspection Reports and licensee assessments. Improvements in the trending program will be reviewed as part of the NRC's oversight of licensee improvement initiatives.

E8.2 (Closed) Notice of Violation No. 50-461/96015-05a: Failure to have appropriate ECCS response time testing acceptance criteria. The inspectors reviewed the safety evaluation and USAR change package developed in response to this violation and had no further concerns.

E8.3 (Closed) Notice of Violation No. 50-461/96015-05b: Failure to have safety evaluation for manual operation of the component cooling water (CCW) expansion tank. The inspectors reviewed safety evaluation 96-082 which documented the manual operation of the CCW expansion tank and had no concerns. The licensee's corrective actions for improving the 10 CFR Part 50.59 safety evaluation program appeared appropriate.

IV. Plant Support

R4 Staff Knowledge and Performance in RP&C

R4.1 Improper Use of the Exit Portal Monitors

a. Inspection Scope (71750)

The inspectors performed routine observations of radiation worker practices upon egress from radiologically controlled areas.

b. Observations and Findings

On December 9, 1997, prior to entering the control room from the radiologically controlled area (RCA), the inspectors observed a non-licensed operator (NLO) processing through the PCM-1B. The inspectors noted that the PCM-1B unit had a trouble light illuminated with a contaminated detector indication. The individual processed through the PCM-1B and received the "count clear-you may pass" signal. The NLO noted the inspectors observing the top of the detector, noticed the contaminated detector indication, but assumed that since the PCM-1B indicated that he was not contaminated, he could exit the radiologically controlled area (RCA). The inspectors contacted the radiation protection (RP) desk to determine whether individuals could process through the PCM-1B with a contaminated detector. RP stated that the PCM-1B could not be used when a trouble light was illuminated.

The technician contacted the operations shift supervisor who discussed the improper use of the PCM-1B during the operations shift briefing. The NLO identified himself to the shift supervisor as the individual who had incorrectly processed through the monitor. The inspectors interviewed the NLO and noted that he did not recall receiving training on appropriate actions for processing through a PCM-1B when it indicated a contaminated detector. Through a review of the Control of Radioactive Material Handbook, the inspectors noted that on Page 7-25, Step 2, under personnel contamination monitors, were the instructions, "Do not use the PCM if the TROUBLE light is illuminated." While this information was relayed to the NLO during radiation worker training, the individual did not recall learning this information. The inspectors considered processing through a PCM-1B with a contaminated detector annunciator an example of a poor questioning attitude and poor awareness of plant indications by operations personnel.

c. Conclusions

Processing through a PCM-1B with a contaminated detector annunciator was an example of a poor questioning attitude and poor awareness of plant indications by operations personnel.

S2 Status of Security Facilities and Equipment

S2.1 Lighting Tour of Protect Area (71750)

No lighting deficiencies were noted during a tour of the protected area on December 29, 1997.

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 January 22, 1998. 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.

X3 Management Meeting Summary

On January 8, 1998, NRC members of the Clinton Restart Panel met with Illinois Power management to discuss the development of the Plan For Excellence and engineering design reviews.

PERSONS CONTACTED

Licensee

W. MacFarland IV - Chief Nuclear Officer
G. Baker, Manager - Quality Assurance
W. Bousquet, Director - Plant Support and Services
J. Gruber, Director - Corrective Action
J. Hale, Director - Planning & Scheduling
B. Joyce, Assistant Plant Manager - Maintenance
M. Lyon, Assistant Plant Manager - Operations
R. Phares, Manager - Nuclear Safety and Performance Improvement
J. Place, Director - Plant Radiation and Chemistry
W. Romberg, Assistant Vice President
J. Sipek, Manager - Regulatory Interface
L. Wigley, Manager - Nuclear Station Engineering Department

INSPECTION PROCEDURES USED

IP 37551: Engineering Observations
IP 61726: Surveillance Observations
IP 62707: Maintenance Observations
IP 71707: Plant Operations
IP 71750: Plant Support
IP 92902: Follow-up - Maintenance
IP 92903: Follow-up - Engineering

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

97025-01	VIO	Failure to implement required TS actions for maintaining secondary containment isolation capability.
97025-02	VIO	Failure to implement required TS actions for maintaining either the Division I or II inverters.
97025-03	NCV	Failure to install test meter isolation transformer.

Closed

96-008-00	LER	Loose terminal connection causes reactor recirculation pumps to trip from fast to slow resulting in operation in the restricted zone and manual scram.
96008-07	VIO	Untimely Completion of Use History Analysis.
97011-06	VIO	Restoration of caution tag.
97011-08	VIO	Failure to complete an impact matrix.
97011-09	VIO	Preconditioning of breakers.
97013-00	LER	Failure to adequately verify no trips exist during surveillance test results in inadvertent actuation of standby gas treatment system.
95003-01a	VIO	Failure of Division III EDG bearing due to inadequate lubrication.
96015-05a	VIO	Failure to have appropriate ECCS response time testing acceptance criteria.
96015-05b	VIO	Failure to have safety evaluation for manual operation of the CCW expansion tank.
97025-03	NCV	Failure to install test meter isolation transformer.

LIST OF ACRONYMS USED

CAL	Confirmatory Action Letter
CCW	Component Cooling Water
CFR	Code of Federal Regulations
C&I	Controls and Instrumentation
CPS	Clinton Power Station
CR	Condition Report
FIN	Fix-It-Now
FTL	FIN Team Leader
I/V	Current to Voltage
LCO	Limiting Condition for Operation
LER	Licensee Event Report
MCR	Main Control Room
MCRL	Mode Change Restrain List
MWR	Maintenance Work Request
M&TE	Measurement and Test Equipment
NLO	Non-Licensed Operator
NRC	Nuclear Regulatory Commission
NSED	Nuclear Station Engineering Department
PMSO	Plant Managers Standing Order
RCA	Radiologically Controlled Area
RHR	Residual Heat Removal
RP	Radiation Protection
SBO	Station Blackout
SRM	Source Range Monitor
TS	Technical Specification
UHA	Use History Analysis
URI	Unresolved Item
USAR	Updated Safety Analysis Report
VF	Fuel Building Ventilation