

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-461  
License Nos: NPF-62

Report No: 50-461/97011 (DRP)

Licensee: Illinois Power Company

Facility: Clinton Power Station

Location: Route 54 West  
Clinton, IL 61727

Dates: April 7 - May 23, 1997

Inspectors: F.D. Brown, Acting Senior Resident  
K.K. Stoedter, Resident Inspector  
R.A. Langstaff, Resident Inspector  
D.M. Chyu, Electrical Systems Inspector  
M. Parker, Senior Resident, Palisades  
S. Ray, Senior Resident, Prairie Island

Approved by: Christopher G. Miller, Acting Chief, Branch 4  
Division of Reactor Projects

9708050306 970725  
PDR ADOCK 05000461  
G PDR

## EXECUTIVE SUMMARY

### Clinton Power Station NRC Inspection Report 50-461/97011 (DRP)

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

#### Operations

- The NRC closely monitored the implementation of the current procedure adherence and adequacy policy. General improvement over previous performance was noted. Prompt changes were made to procedures which could not be implemented as written. (Section O1)
- Operator turnovers usually covered the appropriate information. The inspectors observed an on-duty operating crew demonstrate a questioning attitude and prudently avoid an unnecessary TS LCO entry. However, the inspectors identified several examples of opportunity for improved performance. (Section O1.1)
- The inspectors identified that a non-licensed operator and a maintenance mechanic were in the process of violating procedural steps during a surveillance on the control room ventilation system. A potentially weak independent verification was also identified by the inspectors. One violation was identified. (Section O1.2)
- The inspectors identified that the system drawing for the safety related diesel generator ventilation system was incorrect and that breakers in safety MCCs were mislabeled. This condition had existed since start-up, but had not been identified or corrected by the licensee. (Section O2.1)
- The inspectors identified that valves in the air start systems for all three Emergency Diesel Generators (EDGs), and a valve in the fuel oil system for the Division III EDG, were not locked open as required by the licensee's locked valve program. One violation was identified. (Section O2.3)

#### Maintenance

- The failure to adequately document and communicate the status of job conditions resulted in maintenance induced damage to a containment isolation valve. One violation was identified. (Section M1.3)
- Operations and maintenance failed to establish and verify that plant protective logic was in the appropriate condition which resulted in an inadvertent engineered safety features actuation of the standby gas treatment system during performance of a surveillance. One violation was identified. (Section M1.4)

- A controls and instrumentation technician lifted leads not covered by the procedure and a runback of the "A" reactor recirculation flow control valve resulted. One violation was identified. (Section M1.5)
- The licensee performed tests to determine the revision (identification) number for three breakers before performing "as-found" functional tests. This preconditioning resulted in potentially invalid test data. One violation was identified. (Section M2.1)
- The inspectors noted apparent material condition problems with PosiSeal butterfly valves in service water systems, synch check relays in safety related breakers, and lubricants in motor operated valves. The licensee focused on repairing the specific problems, not on identifying repetitive or potential common mode failure mechanisms, or on preventing reoccurrences. The inspectors were also concerned that material condition problems identified on maintenance work requests received limited review for generic implications. (Section M2.4)
- The inspectors identified that the licensee procedure for controlling material which could clog emergency core cooling system strainers in a post lost of coolant accident environment was inadequate. After a slow initial response to this issue, the licensee initiated actions to resolve the concern. The issue of degraded containment coatings had not been resolved at the end of the period. One violation was identified. (Section M2.5)

#### Engineering

- The inspectors identified that the licensee failed to analyze or evaluate the potential loads on safety related piping induced by temporary scaffolding during a seismic event. One violation was identified. (Section E1.1)
- The licensee identified a potentially generic concern associated with the seismic qualification of circuit breaker cabinets when breakers are removed. The inspectors considered the identification of this issue to have been indicative of a proactive safety consciousness. The implementation of a procedure to address this issue was inadequate. The inspectors identified concerns with the licensee's stated approach to assessing cabinet operability. (Section E1.2)

#### Plant Support

- The inspectors observed an individual reaching into a contamination area without protective clothing. One violation was identified. (Section R1.2)

## Report Details

### Summary of Plant Status

The plant remained shutdown throughout this inspection period.

## I. Operations

### **01 Conduct of Operations**

The inspectors noted that the sensitivity to procedural adequacy and adherence within the Operations Department had, with few exceptions, improved from previous inspection periods. Only two examples of clear non-compliance with working procedures were identified; one of these occurred early in the inspection period, and the other was in the Maintenance area. These examples are discussed in more detail in Sections O1.2 and M1.5. Procedures were used as written or were changed prior to continuing with work during all other direct inspector observations. Approximately 200 procedure changes were processed during this inspection period. Despite these improvements, the inspectors made several observations that indicated continued opportunities for improvement in the general conduct of operations.

#### O1.1 Conduct of Operations in the Control Room

##### a. Inspection Scope (71707)

The inspectors observed Main Control Room (MCR) turnovers to verify that all necessary information concerning plant system status was discussed and understood. The inspectors also performed routine observation of the general conduct of operations within the MCR using Inspection Procedure 71707.

##### b. Observations and Findings

The information provided in turnovers was generally adequate to ensure that oncoming crews were aware of plant status and planned activities.

#### Good Performance Involving Shutdown Cooling

On April 8, 1997, the inspectors entered the MCR and observed the on-duty crew discussing a procedure change. A reactor operator (RO) informed the inspectors that a Residual Heat Removal (RHR) "A" heat exchanger inlet valve 1SX082A, had to be stroked to demonstrate operability. Procedure CPS 9069.02, "Division 1 SX Valve Operability," was written for performance of this valve stroking with Division 1 SX out of service. Existing plant conditions did not support removing Division 1 SX from service, so a temporary procedure change was being processed to stroke the valve independent of a full divisional outage. Two alternatives existed. The first alternative involved securing shutdown cooling, and entering a Technical Specification (TS) Limiting Condition for Operation (LCO). The shift understood that

a member of plant management had directed that this alternative be used. The second alternative involved more demanding work for the operators in that a manual valve in a contamination area would have to be closed and then reopened, but this alternative would not require that shutdown cooling be secured. The crew subsequently revised Procedure CPS 9069.02 to require the more labor intensive alternative, avoiding the otherwise unnecessary TS LCO entry. The inspectors considered the crew's decision to change the operating procedure in a way which avoided an unnecessary TS LCO entry to be indicative of positive performance in operations.

#### Operator Unfamiliarity with Annunciator Status

During a MCR panel walkdown on April 7, 1997 the inspectors noticed that the annunciators for the inboard and outboard reactor core isolation cooling system (RCIC) turbine exhaust vacuum breakers were lit. When the inspectors inquired as to why these specific annunciators were lit, one RO stated that he was unsure. A second RO indicated that the status of RCIC was not important since the system was out of service due to the plant operating in Mode 4. Neither RO attempted to determine why the annunciators were lit. Two days later, the inspectors posed the same question (reason for the RCIC annunciators) to another RO. In this instance, the RO stated that he could not immediately recall the reason why the annunciators were lit; however, he quickly reached for the annunciator response procedure and informed the inspectors that the annunciators were lit due to a Group 7 isolation on low steam pressure.

Although the RCIC system was not operable while in Mode 4, the inspectors were concerned by the operators' unfamiliarity with annunciator status and causes for changes in system configuration. Licensee management told the inspectors that they planned to increase annunciator awareness as part of the improvements in control room professionalism.

#### Weak Communications During Surveillance

On April 28, 1997, the inspectors observed a portion of surveillance Procedure CPS 9070.01, "Control Room HVAC Filter Package Operability Test Run," Revision 25. This surveillance required a 10-hour system run with system data to be recorded every two hours. The procedure stated that five of the parameters were to be recorded from local instruments in the field, and the sixth, system flow, was to be recorded from control room instrumentation. The sheet on which the data was recorded was separate from the procedure, and did not identify where the data was to be obtained. The inspectors observed that data from the field was recorded in the record copy of the surveillance data sheet based on information conveyed over the phone. The inspectors were concerned that each of the five individual values was not provided to the operator, rather, the operator was told the data was "the same as the readings two hours ago." The inspectors felt that this communication technique could result in misrecording one of the five values from the field or the failure of the control room operator to verify that the sixth value had not changed. The inspectors independently obtained the local and control room instrument values

and verified that they were consistent with the recorded data. The on-duty licensee staff informed the inspectors that this was a routine surveillance with data that did not typically change during the test run, and that the observed communication techniques were within management's expectations. The Operations Manager subsequently informed the inspectors that this was an example of an opportunity to improve communication techniques.

#### Tracking Surveillance Dates

On May 7, 1997, operations personnel declared the high pressure core spray (HPCS) system inoperable due to exceeding the allowable surveillance frequency, including the TS extension of 25%. Although operations monitored the surveillance expiration dates of numerous systems including HPCS, the scheduling of the HPCS surveillance was overlooked during turnovers and was not scheduled for performance. Operations personnel recognized the need to perform the HPCS surveillance test approximately one hour before the system needed to be declared inoperable. Since the surveillance test took several hours to perform, operations personnel appropriately declared HPCS inoperable and ensured that actions with a potential to drain the reactor vessel had been suspended in accordance with technical specifications.

#### c. Conclusion

Operator turnovers usually covered the appropriate information. The inspectors observed an on-duty operating crew demonstrate a questioning attitude and prudently avoid an unnecessary TS LCO entry. However, the inspectors identified several examples of opportunity for improved performance.

#### 01.2 Weaknesses in Performance of a Surveillance

##### a. Inspection Scope (61726/71707)

The inspectors observed the performance of surveillance CPS 9170.02, "Control Room HVAC Chilled Water Valve Operability Test," Revision 26, performed on April 8, 1997.

##### b. Observations and Findings

On April 1, 1997, the licensee's revised procedural adherence policy, which required procedure steps to be performed in the order written unless otherwise specified, became effective. During the performance of Procedure CPS 9170.02, the inspectors observed a non-licensed operator (NLO) give a maintenance mechanic permission to perform procedural steps out of sequence. The surveillance procedure required that a flange be installed on line OVC120E, per step 8.1.6, in order to complete in-service testing on the control room ventilation (VC) chilled water shutdown service water makeup check valve. Upon test completion, the mechanic inquired if the installed flange could be removed. The NLO briefly reviewed the procedure and gave the mechanic permission to remove the flange.

As the mechanic began loosening the flange connection, the inspectors recognized that the next procedure step instructed the closure of the auto makeup inlet isolation valve. The procedure step did not reference the removal of the flange. The inspectors called the mechanic's attention to this fact, and the mechanic stopped the flange removal. The pipe behind the flange was pressurized with low energy chilled water at the time of the inspectors' observation.

The failure to perform procedure steps in the order stated by the procedure was considered a violation (50-461/97011-01) of TS 5.4.1.

Step 8.1.12 directed that valve OVC016A be closed and independently verified. The inspectors observed that the independent verifier was in close proximity to the procedure performer and possibly watched the step performance. The inspectors then asked the independent verifier if the independent verification method used met the time and distance expectations delineated in Procedure CPS 1401.01, "Conduct of Operations," Revision 22. The independent verifier stated that his presence at the job site was acceptable as long as he was not directing the actions of the individual performing the surveillance. Procedure CPS 1401.01, stated that independent verification was "intended" to have both time and distance between the act and the verification. The inspectors discussed the apparent inconsistency between the operator's understanding of the requirements and Procedure CPS 1401.01's stated "intent." Operations Department managers informed the inspectors that the observed performance did not completely satisfy plant management's expectations, but did satisfy the plant's procedural requirements. The inspectors will continue to assess the effectiveness of the plant's independent verification procedures and practices under Inspector Follow-up System item EEI 50-461/96015-01a.

The inspectors also observed the independent verification of Step 8.1.22 which ensured that instrument vent valve OPC-VC550AV was closed. Upon finding the instrument, the independent verifier noticed that the vent valve was not labeled with an equipment identification number (EIN). The procedure performer explained that since the instrument was labeled, and the instrument had only one vent, he was confident that the correct valve was manipulated. The independent verifier was not comfortable signing the procedure step and contacted the control room for further guidance. It was later determined that the performer manipulated the correct valve. The inspectors considered the independent verifier's actions to be appropriate.

c. Conclusions

The inspectors identified that a NLO and a maintenance mechanic were in the process of violating procedural steps during a surveillance on the Control Room ventilation system. A potentially weak independent verification was also identified by the inspectors. One violation was identified.

## 02 Operational Status of Facilities and Equipment

### 02.1 Engineered Safety Feature (ESF) System Walkdowns (71707)

#### a. Inspection Scope

The inspectors used Inspection Procedure 71707 to walkdown portions of the low pressure core spray system (LPCS), the diesel generator room ventilation system (VD) and the Division II safety related switchgear. Although not an ESF system, the inspectors also walked down portions of the component cooling water (CC) system.

#### b. Observations and Findings

On April 14, 1997, while performing a routine walkdown of safety related and ESF switchgear, the inspectors noted that the 480 VAC breaker at Motor Control Center (MCC) 1B1, cubicle 9D, was in the open, deenergized, position. This breaker was labeled as "D.G. Room 1B Vent Sys. Damper 1VD12YB." The inspectors asked the Line Assistant Shift Supervisor (LASS) why the breaker was deenergized. The LASS reviewed the mechanical system drawing for the system, M05-1103, "Diesel Gen. Room Ventilation (VD)," Revision L, and concluded that 1VD12YB was a motor operated valve (MOV) which appeared to be required for system balancing. The LASS could not immediately determine why the damper breaker was open.

The licensee subsequently determined that Field Engineering Change Notice (FECN) 14531 had removed power from Dampers 1VD12YA, 1VD12YB, and 1VD12YC during post-construction system testing. The MCC label for 1VD12YC had been corrected to read "spare," but the MCC labels for 1VD12YA and 1VD12YB had not been updated. The licensee initiated a condition report (CR) and hung caution tags on the breakers labeled as 1VD12YA and 1VD12YB to indicate that they were "spares."

The inspectors walked down the VD systems and determined that dampers 1VD12YA, B, and C were installed, and were provided with self contained hydraulic actuators. Based upon the licensee's determination that no power was supplied to these actuators, they were essentially manual valves, contrary to the system drawing.

The inspectors reviewed drawing M05-1103 to determine whether it contained other errors. No other discrepancies were noted.

The inspectors discussed the VD system observations with the cognizant system engineer. The system engineer informed the inspectors that an operator had identified the mislabeling of the 480 VAC breakers for 1VD12YA and B in January 1997, but that the breaker labels had not yet been corrected when the inspectors noted the problem. The M05-1103 discrepancies had not previously been identified or documented.

The inspectors considered the incomplete implementation of FECN 14531 and the discrepancies of M05-1103 to be examples of a problem with design control. However, this problem was of minor significance and is being treated as a **Non-Cited Violation (50-461/97011-02)** consistent with Section IV of the NRC Enforcement Policy. The inspectors were concerned that system walkdowns by operators and system engineers were weak, since a non-energized breaker in a safety related MCC had not been investigated and dispositioned during nine years of plant operation. Similar concerns are identified in Section M2.3 of this report.

c. Conclusions

As the result of a system walkdown, the inspectors identified that the system drawing for the safety related VD system was incorrect and that breakers in safety MCCs were mislabeled. These conditions had existed since start-up, but had not been corrected by the licensee. The conditions did not affect system operability. No concerns were identified during the LPCS or CC walkdowns.

02.2 Inconsistencies Found Within Equipment Control Program

a. Inspection Scope (71707)

During the course of plant tours, the inspectors verified the position of various components and that danger and caution tags were placed on the proper equipment.

b. Observations and Findings

During a make-up water pumphouse (MWPH) walkdown, the inspectors noted that the EIN on danger tag 57 for tagout 96-1049 did not match the nameplate on the breaker cubicle. Specifically, the danger tag stated the EIN as OWM12PA (power supply for the makeup demineralize pump) while the breaker cubicle nameplate stated "spare."

The licensee told the inspectors that the EIN for the breaker within the cubicle was previously OWM12PA. However, the breaker was abandoned as part of a upgrade to the MWPH, and the cubicle nameplate was changed without updating the tagout information.

Inspection Report 50-461/96009 discussed deficiencies in the safety tagging program, including the absence of a feedback mechanism to correct tagging inconsistencies. The safety tagging supervisor explained to the inspectors that feedback to correct changes in the plant due to modifications was provided prior to releasing the modification for operations. However, feedback to correct tagging deficiencies which occurred during the installation of a modification, or due to the abandonment of equipment, did not normally occur and was not required by the licensee's safety tagging or modification programs. The inspectors were concerned

by the practice of not updating tagouts during modifications since post modification testing could require energization of mislabeled components prior to the modification's release for operation. This could reduce the effectiveness of the personnel safety provided by the tagout. The licensee acknowledged this issue during discussion with the inspectors.

c. Conclusions

The inspectors identified that the licensee's safety tagging program allowed inconsistencies between equipment EINs and the EIN listed on safety tags to exist during the performance of modifications. The inspectors considered this a weakness since the level of personnel safety during post modification testing could be affected by the inconsistent nomenclature.

02.3 Implementation of Locked Valve Program on Emergency Diesel Generator (EDG) Support Systems

a. Inspection Scope

The inspectors performed routine walkdowns of the EDGs and their support systems and compared the observations to the licensee's program requirements.

b. Observations and Findings

Procedure CPS 1401.01, "Conduct of Operations," Revision 26, Section 8.5.2, required that components, the unauthorized manipulation of which could compromise plant safety or availability, be chained, lockwired, or otherwise suitably locked. The inspectors observed that six valves in the air start system for the Division I EDG, and six valves in the air start system for the Division II EDG were not locked open. Four valves in the air start system for Division III were not locked open. The valves involved were 1DG150 through 1DG165. One valve, the supply emergency cutoff valve in the Division III fuel oil system, was also not locked open.

The inspectors questioned plant staff as to why the air start and fuel oil valves were not locked open since the closure of one or more of these valves would appear to compromise the availability of the EDGs. Plant staff acknowledged that the valves should have been locked open, and were in the process of locking the valves open at the end of the inspection period. Plant staff did not know why the valves had not previously been locked or tagged. The failure to lock open the Division III EDG fuel oil supply cutoff Valve and valves 1DG150 through 1DG165 as required by Procedure CPS 1401.01 was a violation (50-461/97011-03) of TS 5.4.1.

c. Conclusions

The inspectors identified that valves in the air start systems for all three EDGs, and a valve in the fuel oil system for the Division III EDG, were not locked open as required by the licensee's locked valve program. One violation was identified.

**07 Quality Assurance in Operations**

**07.1 Review of Emergency Response/Emergency Operating Procedures (EOPs) Audit**

**a. Inspection Scope (71707)**

The inspectors reviewed Audit Report Q38-97-03, "Emergency Response/Emergency Operating Procedures," issued April 29, 1997.

**b. Observations and Findings**

The inspectors confirmed, through discussions with the lead auditor, that no walk throughs of EOPs had been conducted during performance of Audit Report Q38-97-03. The lead auditor stated that procedure walk throughs were more of a performance review rather than a compliance review. Due to recent changes in philosophy, Nuclear Assessment management had determined that audits should focus more on compliance and that surveillances would focus more on performance. However, the lead auditor was not aware of whether surveillances had reviewed EOPs from a performance standpoint. Based on discussions with the surveillance supervisor, the inspectors determined that no surveillance had covered EOP walk throughs in the previous year. The inspectors considered procedure walk throughs an important assessment tool for: 1) assessing the adequacy of procedure validation and verification (V&V), 2) confirming that changes in the field since V&V have not adversely affected performance of the procedure, and 3) assessing operator training and knowledge.

**c. Conclusions**

An audit of EOPs lacked depth in that procedures were not verified in the field. Not performing procedure walkthroughs of a sample of EOPs, either through audits or surveillances, was considered a weakness.

**II. Maintenance**

**M1 Conduct of Maintenance**

**a. Inspection Scope (61726/62703)**

The inspectors observed or reviewed portions of the following surveillance and maintenance work requests (MWRs) and other maintenance activities.

-MWR D76266/CPS 8433.01

Generic Procedure for 125 VDC Battery Maintenance

-MWR D71146

Packing Replacement for Reactor Water Cleanup Valve 1G33F053

-MWR D76456	Rotor Work on RCIC Turbine Exhaust Vacuum Breaker
-PCIFWM135	Feedwater Flow Line A Flow Transmitter Loop Calibration
-CPS 9053.07	RHR B/C Pumps and RHR B/C Water Leg Pump Operability
-CPS 9170.02	Control Room HVAC Chilled Water Valve Operability Test
-CPS 9382.02	125 VDC Battery ICV and Battery Charger Checks
-CPS 9532.61	CRVICS Fuel Building Exhaust Radiation 1R1X-PRO06A (B,C,D) Channel Functional Test
-CPS 9069.02	Div I SX Valve Operability
-CPS 9070.01	Control Room HVAC Filter Package Operability Test Run
-CPS 8410.07	Reactor Recirculation 6900 Volt Vacuum Circuit Breaker Maintenance

b. Observations and Findings

The inspectors found the work performed under these activities to be generally acceptable, with procedures present and in use. Comments for specific work activities are discussed in further detail below. Due to the operator performance issues identified during the performance of Procedure CPS 9170.02, all relevant comments were included in Section O1.2.

M1.2 Performance of 125VDC Battery Maintenance

a. Inspection Scope (62703)

The inspectors observed portions of the maintenance performed on the Division II 125VDC battery under MWR D76266.

b. Observations and Findings

While torquing the battery terminals of a Division II battery, the torque wrench slipped and came into contact with a neighboring battery post, causing a short discharge. Although the torque wrench had been taped to provide electrical insulation prior to use, the electrician had not taped the area around the torque

wrench dial. No personnel were injured and only minor damage to the battery post occurred.

The system engineer performed an as-found inspection and noted no battery abnormalities. However, to ensure that the battery internals were not damaged, the system engineer requested that specific gravity and cell voltage checks be performed on both cells in their discharged condition.

The inspectors later learned that the electricians had decided not to perform the requested cell voltage and specific gravity checks since these actions were not supported by an approved procedure. Electrical Maintenance (EM) personnel did not communicate their inability to perform the requested checks to the system engineer. The cell voltage and specific gravity readings for all cells were obtained after the cells were recharged and prior to returning the battery to service. No deficiencies were identified with cell voltage or specific gravity.

The inspectors reviewed the condition report (CR) associated with this event and questioned the description of the immediate actions taken. Specifically, the immediate corrective actions stated "stopped work, directed that a set of gravities be taken on Cells 4 and 5, had NSED evaluate damage." These actions were signed as complete although, as explained above, the pre-recharge "set of gravities" requested by the system engineer were not obtained.

Procedure CPS 1016.01, "Condition Reports," Revision 29, Step 8.1.4.2a, states "document immediate actions and ensure actions are carried out and/or initiated as necessary and initial/date when complete in space provided on CPS No. 1016.01F001." The inspectors considered EM supervision's signoff that the initial corrective actions were complete when alternate actions were performed to be a violation of Procedure CPS 1016.01. However, this violation is of minor significance and is being treated as a **Non-Cited Violation (50-461/97011-04)** consistent with Section IV of the NRC Enforcement Policy. See Section M7.1 for additional discussion of this issue.

c. Conclusions

Poor insulation of a torque wrench resulted in shorting between two 125VDC safety related batteries. No significant damage occurred to the batteries. EM personnel failed to obtain revision to a corrective action document when the specified actions could not be completed.

M1.3 Damage to MOV Motor Overload Heaters Due to Inadequate Turnover

a. Inspection Scope (62703)

The inspectors reviewed the circumstances surrounding damage to the reactor core isolation cooling (RCIC) exhaust vacuum breaker outboard isolation valve (1E51F077) during VOTES™ testing.

On April 23, 1997, night shift EM personnel suspended VOTES testing of Valve 1E51F077 to correct problems with a limit switch. While testing was suspended, operations personnel noticed that the associated MOV test prep switch (TPS) was not in its usual position, and asked the EM personnel whether it could be returned to "normal." The EM and operations personnel concluded that the TPS no longer needed to be in "o, pass" since testing of the MOV was suspended. Following this discussion, operations personnel returned the TPS to the normal position.

On April 24, the day shift EMs completed work on the limit switch and resumed preparations for VOTES testing. While the day shift EMs verified the position of many tags prior to resuming work, verification of all previously performed steps was not required. The night shift EMs had not communicated the repositioning of the MOV TPS during turnover with the day shift EM group leader and had not included this information within the MWR continuation sheets. The MOV TPS was not repositioned prior to performing the VOTES test. This resulted in EM and engineering personnel performing the test without thermal overload or torque switch protection (torque switch protection was bypassed due to test set-up). The MOV motor and breaker sustained damage when the valve was subjected to a locked rotor condition.

b. Observations and Findings

The licensee wrote condition report CR 1-97-04-187 describing the event and held a critique (EM 97-010). Specific observations concerning the critique are discussed in Section M7.3.

Procedure CPS 1501.02, "Conduct of Maintenance," Revision 18, Step 8.1.4.6, which the inspectors reviewed, stated "if work is performed during more than one shift provide information to succeeding shift personnel to assure work is completed in a safe and effective manner." The inspectors considered the failure to provide information on the status of the MOV TPS to be a violation (50-461/97011-05) of TS 5.4.1.

c. Conclusions

The failure to adequately document and turnover the status of job conditions resulted in maintenance induced damage to a containment isolation valve. A violation of procedure was identified.

M1.4 Initiation of Standby Gas Treatment (VG) System During Surveillance Activity

a. Inspection Scope (61726)

The inspectors reviewed the circumstances surrounding an inadvertent initiation of the VG system during a channel functional test of process radiation monitor PR006A.

b. Observations and Findings

The inadvertent actuation of the VG system occurred due to inserting a trip signal to Process Radiation Monitor PR006A while monitor PR006D was inadvertently in a tripped condition. Monitor PR006D was placed in trip on March 6, 1997, when caution tagout 97-9330 was hung to administratively control the position of the local trip switch. Operations cleared tagout 97-9330 on April 4, 1997, but did not place the local trip switch back to the normal position due to inadequate tagout restoration guidance. Specifically, the caution tagout restoration position referred to the removal of the caution tag without giving guidance as to the position of the local trip switch. Because of this error, the local trip switch for monitor PR006D remained in trip. Procedure CPS 1014.01, "Safety Tagging," Revision 22, Step 8.6.3, required that the proper restoration position be identified for tag removal. The failure to include the restoration position for the local trip switch on monitor PR006D was a violation (50-461/97011-06) of TS 5.4.1.

During the critique for the inadvertent VG system actuation, licensee staff identified one procedure noncompliance. Step 8.1.8 of Procedure CPS 9532.61, "CRVICS Fuel Building Exhaust Radiation 1RIX-PR006A (B,C,D) Channel Functional Test," Revision 38, directed the controls and instrumentation (C&I) technician to ensure the components for each division were in the untripped condition by connecting a digital multi-meter (DMM) to the associated terminals and verifying that the DMM indicated approximately 0 volts. The C&I technician that performed Step 8.1.8 stated that he must have mistakenly read the voltage between Terminal TB2-11 and ground as zero volts when it was actually 120 volts. Because of this error, the C&I technician did not identify that monitor PR006D was in the tripped condition. The licensee determined that the physical constraints associated with this voltage reading made obtaining accurate readings difficult. Corrective actions included revising the test process so that accurate voltage readings were more likely to be obtained. The failure to accomplish the channel functional test of monitor PR006A in accordance with Procedure CPS 9532.61 was licensee identified and corrective actions were considered appropriate and is therefore being treated as a **Non-Cited Violation (50-461/97011-07)** consistent with Section VII.B.1 of the NRC Enforcement Policy.

c. Conclusions

The failure of Operations and Maintenance to establish and verify that plant protective logic was in the appropriate condition resulted in an inadvertent ESF VG system actuation during performance of a surveillance. One violation and one non-cited violation were identified.

M1.5 Lifted Lead Results in Reactor Recirculation (RR) Flow Control Valve Runback

a. Inspection Scope (61726)

The inspectors reviewed the details surrounding a runback of the "A" RR flow control valve during performance of a preventive maintenance (PM) activity.

b. Observations and Findings

On May 14, 1997 C&I personnel performed PM task PCIFWM135, calibration of the feedwater flow measurement instrument loop. The PM data sheet instructed the C&I technician to obtain correct contact indication between terminals 13 and 14 on trip unit 1C34-K618A by measuring the voltage between these two terminals. Due to plant conditions, correct contact indication could not be obtained using the above method because the indication was masked by position of the contacts between Terminals 9 and 10 (Terminals 9, 10, 13, and 14 are in parallel). To obtain an accurate contact indication, the technician lifted lead between Terminals 13 and 14. Because wiring from Terminal 14 supplied power to trip units further downstream, power was lost to other trip units as the lead was lifted. This produced an unexpected runback of the "A" RR flow control valve (the "B" valve was locked out prior to the event). The RR flow control valves are a reactivity control when the unit is operating.

Operations personnel initiated a CR and held a critique following this event. The technician involved in the event stated that he did not consult any prints prior to lifting the lead because he assumed that his actions would have no effect on the plant. Lifting of leads was not authorized within the work package. C&I supervision noted that the technician's actions were not covered within the system impact matrix for the task. The inspectors reviewed the work package and determined that two additional leads were lifted without an appropriate system impact matrix.

Procedure CPS 1501.02, "Conduct of Maintenance," Revision 18, Step 4.8, stated "if the work requires lifting leads or otherwise interrupting electrical circuit continuity...complete a system impact matrix and attach it to the work document." The inspectors considered the failure to complete a system impact matrix to evaluate the consequences of actions not previously evaluated in accordance with Procedure CPS 1501.02 to be a violation (50-461/97011-08) of TS 5.4.1. The inspectors were concerned by this occurrence because it involved a plant employee who knowingly performed steps not covered by the work package in use, or by an approved procedure, a performance issue for which plant management had initiated substantial corrective actions.

c. Conclusions

A C&I technician lifted leads not covered by the procedure and a runback of the "A" reactor recirculation flow control valve resulted. One procedural violation was identified.

## M2 Maintenance and Material Condition of Facilities and Equipment

### M2.1 Breaker Testing

#### a. Inspection Scope (61726)

The inspectors reviewed:

- Job No. PEMAP1012, "8410.04 Testing for 1DC14E4A/15"
- Job No. PEMAP1054, "8410.04 Testing for 1AP41E2C"
- Job No. PEMAP1057, "8410.04 Testing for 1AP73E13C"
- CR 1-96-12-124, "Questionable Breaker Not Removed From System"
- CPS 8410.04, "Molded Case Circuit Breaker Functional Testing and Maintenance," Revision 9
- CPS 8410.05, "Type HE Molded Case Circuit Breaker Revision Level Test," Revision 4
- Licensee responses to Information Notices 89-21 and 96-24
- Calculation Numbers 19-M-3, Revision 1, 19AN-4, and 19-AQ-3

#### b. Observations and Findings

On February 27, 1989, the NRC issued Information Notice (IN) 89-21, "Changes in Performance Characteristics of Molded-Case Circuit Breakers." This IN discussed instances in which vendors made revisions to the performance characteristics of molded-case circuit breakers (MCCBs) without making corresponding revisions to the breaker's part number. In addressing this issue, the licensee re-classified MCCB part numbers as 1976/Revision 3, 1986/Revision 3, 1985/Revision 4, 1989/Revision 4, or 1990/Revision 5 based on individual breaker performance characteristics. The licensee then performed reviews to determine whether the newly classified breakers remained properly coordinated. The reviews determined that all installed safety related breakers were acceptable. The licensee was still reviewing the acceptability of the 120V distribution panels. In addition, the licensee determined that safety related MCCs could contain breakers having all MCCB revisions while non-safety related MCCs could only contain MCCBs having certain revisions.

The licensee periodically performed Procedure CPS 8410.04 to verify the operability of installed MCCBs. This procedure applies a designated current to each tested breaker to ascertain the proper breaker response. In addition, the licensee developed Procedure CPS 8410.05 to test MCCBs in the plant's store room to verify or identify these breakers' part number revisions prior to their use in the plant. The inspectors determined that Step 8.1 of Procedure CPS 8410.05 required exercising (manually opening and closing) a tested breaker 5 times to ensure free operation. Therefore, the performance of Procedure CPS 8410.05 on an installed breaker prior to performance of Procedure CPS 8410.04 would constitute breaker preconditioning in that test data obtained after manual cycling of the breaker would no longer represent the breakers' in service performance. The inspectors reviewed

Procedure CPS 8410.04 and did not identify any preconditioning concerns. The licensee stated that Procedure CPS 8410.05 was not intended to be performed on installed MCCBs.

On December 11, 1996, Procedure CPS 8410.05 was partially performed on installed breaker 1AP41E2C, which protects containment penetration 1C11-F003. The licensee subsequently completed Procedure CPS 8410.04 with satisfactory results. In response to the inspectors' questions, the licensee identified that on October 9 and December 30, 1996, installed Breakers 1AP73E13C and 1DC14E4A/15, respectively, were also tested by Procedure CPS 8410.05 prior to performance of Procedure CPS 8410.04.

10 CFR Part 50, Appendix B, Criterion V, "Procedures," required in part, that activities affecting quality be prescribed by procedures appropriate to the circumstances. The licensee's procedures for testing Breakers 1AP41E2C, 1AP73E13C, and 1DC14E4A/15 were not appropriate in that they did not ensure that as-found data was obtained for comparison with the as-found acceptance criteria required by 10 CFR Part 50, Appendix B, Criterion XI. These procedures which were not appropriate to the circumstances were a violation (VIO 50-461/97011-09) of 10 CFR Part 50, Appendix B, Criterion V.

c. Conclusions

The licensee performed tests to determine the revision number for three breakers before performing "as-found" functional tests. This preconditioning resulted in potentially invalid test data. A violation of 10 CFR Part 50, Appendix B, Criterion V was identified.

M2.2 Installation of Temporary Modifications

a. Inspection Scope (62707)

The inspectors were concerned that some temporary modifications (TMs) were installed incorrectly with the supply line connected to load terminals and load connected to line terminals. The inspectors reviewed the following work packages:

- MWR D73749 for TM 97-010, "Alternate Power to 120V distribution panel in 1AP75E to keep VR/VQ Running," installed on January 26, 1997
- MWR D72424 for TM 96-101, "Temporary Power for 1FC023 During Division 2 Bus Outage," installed on December 30, 1996, and removed on January 2, 1997.
- MWR D62937, for TM 97-014, "Temporary Power to Operations Radio Base Station A, Receiver Cable 3 and 1JB674," installed on March 3, 1997

- MWR D73885 for TM 97-004, "Install Temporary Modification to Maintain Power to 1AP87E," installed on January 17, 1997, and removed on January 20, 1997.
- MWR D72416 for installing TM to maintain power to 125 VDC MCC 1D during 4160 Bus 1B1 outage, installed on December 27, 1996, and removed on January 6, 1997.
- MWR D60155 for installing and removing TM to cross-tie non-divisional battery charger to Division 2 DC bus, installed on December 9, 1996, and removed on December 19, 1996.

b. Observations and Findings

Step 9 in MWR D62937, stated, "Lift and remove the line side leads from the top of Breaker 10AL. Using conductors/cable of Min 4 AWG, jumper from the load side of Breaker 10AR to the line side of Breaker 10AL." The licensee connected two breakers in series to provide breaker protection. The inspectors did not identify any personnel safety concern with this breaker configuration.

MWRs D72416 and D60155 required installation of cross-ties from the non-divisional MCC 1F to divisional MCC 1D and 1B, respectively, during a bus outage in accordance with Procedure CPS 3503.01, "Battery and DC Distribution." Step 8.2.7.3.8 in Procedure CPS 3503.01 required connection of two conductors to the load side of the spare breaker on MCC 1F. By conventional configuration, the top of the breaker was designated as the line terminal and the bottom of the breaker as the load terminal. However, for the spare breaker, the line side was connected to the bottom of the breaker. The procedure did not clarify that the load side was at the top of the breaker. Therefore, it would appear that the conductors were terminated to the line terminals.

Step 8.2.7.2.9 in Procedure CPS 3503.01 required connection of a Class 1E disconnect switch to the spare breaker at MCC 1F. However, the procedure did not clarify that the connection should be made to the load terminals which were located at the top of the breaker. The licensee initiated Comment Control Forms (CCFs) to clarify that the spare breaker had its line conductors terminated at the bottom terminals. In addition, the connection of the conductors or the disconnect switch was to be made to the load terminals located at the top of the spare breaker for MCC 1F.

In both installations, the conductors and the disconnect switch were connected to the load terminals located at the top of the spare breaker. This field configuration was in accordance with Drawing No. E03-1DC17E. The inspectors also reviewed the drawings for the line and load connections of UPS breakers for MCC 1A, 1B, and 1D. The line terminals were designated at the bottom of the breakers. The licensee reviewed the vendors manuals and concluded that the in-plant configurations were consistent with the vendor and design drawings.

c. Conclusions

The inspectors did not identify any installation problems associated with the instructions provided in the above work packages. However, there were minor procedural deficiencies in Procedure CPS 3503.01 for which the licensee initiated CCFs.

M2.3 Miscellaneous Material Condition Problems

a. Inspection Scope (71707)

The inspectors toured the facility to assess material condition.

b. Observations and Findings

The inspectors observed the following undocumented deficiencies on safety-related equipment:

- The inspectors noted a number of room and equipment coolers with loose or broken inspection door handles. None of the problems had been identified with maintenance request tags. Examples of room coolers with deficient handles included the reactor core isolation cooling room, "A" RHR heat exchanger room, "B" shutdown service water room, and several of the safeguards switchgear rooms. In addition, several non-safety related room coolers had similar deficiencies.

Although the inspectors did not identify any operability issues with the deficiencies, they were concerned that certain ventilation lineups might result in the cooler housing being briefly pressurized, popping open the doors. This could result in the cooling coils being bypassed during subsequent operation of the fans. The concern was brought to the attention of the Shift Supervisor. The inspectors noted that most of the deficient handles on safety-related coolers had subsequently been identified with maintenance request tags.

- The inspectors noted that the Standby Liquid Control common supply line check valve, Valve 1C41-F006, was missing the cotter pin and lock wire which would normally hold the manual operating lever in place. Similar valves in other systems had the cotter pins and wires. Lack of the pin would not affect operability unless something caused the handle to move from its normal position. The inspectors informed the LASS of this finding. The LASS determined that the presence of the pin and lock wire was not checked in the system valve lineup checklist, was not shown on the piping and instrumentation drawing, was not included in the locked valve program, and was not required by TSs. However, the LASS had a maintenance request tag placed on the valve to initiate action to get the pin and wire installed.

The inspectors later discussed the issue with the system engineer. The engineer determined that the applicable drawing for the valve (Anchor/Darling

Valve Company drawing W8121407, revision C) showed that the pin and lock wire should be installed. The inspectors reviewed surveillance Procedure 9015.02, "Standby Liquid Control Injection Operability," Revision 33, which manually exercised the valve, using the handle, and noted that it did not mention the pin or lock wire. The inspectors reviewed maintenance procedure 8120.04, "Maintenance of Anchor/Darling Tilting Disc Check Valves," Revision 12, and noted that the procedure provided instructions to install the pin and lock wire when reassembling the valve after maintenance. However, the inspectors noted that Procedure 8120.04, Appendix C, "List of Anchor/Darling Tilting Disc Check Valves," did not list 1E41-F006 or 1E41-F007. The system engineer agreed that both of those valves should have been included on the list, and wrote a comment control form to initiate a revision.

- The inspectors noted that both constant level oiler bulbs on the A fuel pool cooling pump were missing their locking bolts. The inspectors were concerned that a seismic event or significant pump or piping vibration could cause the bulbs to fall off. Loss of the oiler bulbs would not have an immediate effect on operability of the pumps, but would prevent the oiler from automatically compensating for small oil losses. The inspectors informed the LASS of the concern. The oilers were subsequently corrected.

c. Conclusions

The inspectors noted minor material condition issues associated with safety related room coolers, a safety related check valve, and oilers on a fuel pool cooling pump. All of these problems should have been readily apparent to plant management, operators, and system engineers performing tours and system walk downs.

M2.4 Material Condition Deficiency Identification and Tracking

a. Inspection Scope (62703)

The inspectors performed routine assessments of equipment histories, maintenance records, and current maintenance requests to identify repetitive failures, indications of possible common mode failure mechanisms, or other adverse performance trends which might be indicative of ineffective or inadequate maintenance.

b. Observations and Findings

The inspectors observed several material condition issues during this inspection period which did not appear to be receiving adequate attention. While the material conditions had been identified for repair, the inspectors found that in some cases prompt operability determinations or evaluations for possible common mode failures, repetitive failures in components with different unique identifiers (EINs), or other adverse trends were not being performed. No examples of inoperable

equipment for which appropriate actions were not taken were identified, but the inspectors were concerned by the potential programmatic implications of this issue.

### PosiSeal Butterfly Valves in Service Water Systems

During a plant tour on April 30, 1997, the inspectors noted that there were maintenance request tags on valves 1SX014A and 1SX014B, the service water (WS) to SX isolation valves. The tags noted that there was leakage from the SX to WS systems when the valves were closed. The inspectors were concerned by the potential effect of flow diversion on SX operability, and investigated the issue. Both valves were PosiSeal butterfly valves.

MWR D73235 had been issued on December 19, 1996, because the licensee noted that the WS system remained pressurized when the WS pumps were secured and the 1SX014A and B valves were closed. The valves are automatic isolation valves designed to close whenever the associated SX pump start, thus isolating the non-safety related WS piping from the safety related SX piping. Excessive leakage through the valves could degrade the availability of SX cooling water to safety-related loads. The inspectors noted that the MR was evaluated by the Shift Supervisor as having no significant effect on operability and was given a priority of 4 with "repair with unit on line" indicated. The inspectors discussed the condition of the valves with the system engineer in an attempt to evaluate whether the operability decision and priority were appropriate.

The system engineer stated that the amount of leakage was small, and that the isolated WS system had been maintained depressurized by continuously draining through a 3/4-inch drain line. The system engineer said that at about the same time the back leakage was discovered, significant back leakage was identified through 1SX014C on Division III SX, and the valve had been replaced. The inspectors asked whether the leakage through any of the three valves had been quantified, whether the leakage had been formally analyzed for effects on SX system operability, and whether a CR had been issued. The answer to all the questions was "no."

The next day the system engineer informed the inspectors that he had thought about the issue further and decided to recommend that both valves be replaced. On May 5, 1997, CR 1-97-05-050 was issued documenting the concerns, a conditional operability determination, and the need for further evaluation of the leakage. The conditional operability determination was based on the fact that the unit was shutdown and that the temperature of the ultimate heat sink was 45 degrees below the design maximum.

On May 8, 1997, licensee engineering, outage planning, and other personnel met to discuss the plans for resolving the issues with the valves. Engineering personnel stated that the valves should be replaced because once PosiSeal butterfly valves started leaking, degradation could accelerate. Information was presented regarding the condition of Valve 1SX014C which had been replaced, previous replacement of the Valves 1SX014A and B, and problems experienced with similar valves which isolated SX from the fuel pool cooling system. The decision was made to replace both valves.

The inspectors performed a cursory review of the history of PosiSeal butterfly valves in service water applications at Clinton Power Station. The inspectors determined that Valves 1SX014A, B, and C had been replaced in 1991 and 1992 due to excessive leakage, and that similar valves had failed to provide adequate isolation between the SX and component cooling water systems earlier in the current outage (Inspection Report 50-461/96015, Section M2.1).

The inspectors concluded that PosiSeal butterfly valves had a history of in service failure at Clinton, were known to degrade rapidly once seat leakage developed, and were capable of rendering the SX system inoperable due to inter-system leakage. The inspectors also determined that the licensee had not evaluated whether the maintenance, testing, and planned replacement programs for these valves provided reasonable assurance of SX system operability during future operating cycles.

#### Synch Check Relay Failure in Safety Related Breaker

On April 11, 1997, the inspectors performed a routine review of MCR logs. During this review, the inspectors noted that 4160 volt breaker 1AP09EC feeding the "1B1" safety related bus from the Emergency Reserve Auxiliary Transformer (ERAT), had failed to close during an attempted bus transfer. This failure had occurred approximately ten hours earlier. A MWR had been initiated to trouble shoot and repair the breaker. A CR was not generated until the inspectors asked whether one was appropriate.

The CR which was subsequently written for the breaker failure provided the additional information that the breaker failure had been caused by a faulty synch check relay. The CR classified the degraded material condition as a Maintenance Rule functional failure. The inspectors verified that the synch check relay was not required for automatic transfer of the bus, but noted that TS surveillance SR-3.8.1.3 required periodic manual operation of the breaker with successful transfer of bus 1B1 as acceptance criteria.

The inspectors performed a cursory review of the history of synch check relays at the Clinton Power Station. The inspectors determined that the failure of synch check relays had previously been documented in Inspection Report 50-461/96009, Section M1.2, and that during the course of that inspection period, plant staff had told the inspectors that synch check relays had a history of failures.

The inspectors were concerned that a safety related breaker failed to meet its TS surveillance acceptance criteria, as demonstrated by an in service failure to close, and that this failure was attributed to a component with a known failure history, but no CR was written until the inspectors intervened, and no investigation of root cause for prevention of failure repetition was initiated by the licensee.

#### Lubricant Degradation in a Safety Related Motor Operated Valve (MOV)

While reviewing MWR D76456 for the RCIC exhaust vacuum breaker outboard isolation valve, a safety related valve, the inspectors noted that a MWR

continuation sheet entry had been made which identified degraded lubricant on the pinion gear of the MOV actuator. The MOV was being repaired to correct limit switch deficiencies. The inspectors noted that this lubricant degradation had not been identified on any tracking document, so neither the condition or its causes could be analyzed or trended.

The inspectors reviewed the PM tasks for the above valve and determined that the last PM on the MOV had been performed in 1992. The inspectors determined that the vender recommended replacement of the MOV lubricant on an 18 month frequency, or as appropriate based upon service experience. The inspectors found that the exhaust vacuum breaker outboard isolation valve had originally been on a 18-month PM frequency, but that the PM frequency had been changed to 54 months after 1992. The inspectors verified that the recommended lubricant had been used in the current and preceding PMs.

The inspectors were concerned that the cause and consequences of this degraded lubricant in a safety related valve was not being evaluated. The inspectors discussed the condition of the MOV lubricant with a maintenance individual who stated that all MOVs exhibited similar lubricant degradation, and that it "was nothing to be concerned about." The inspectors were concerned that the information on degraded lubricants was not being adequately tracked, trended, or analyzed.

#### History of Licensee Assessment of Material Condition Problems

The inspectors reviewed the licensee's history of identifying and assessing material condition problems relative to repetitive or generic failure mechanisms. The CR 1-89-05-084 had identified inconsistencies between how MWRs and CRs were used to assess material condition deficiencies. The Notice of Violation attached to Inspection Report 50-461/92016 identified that a material condition deficiency resolved on a MWR had not been adequately assessed for generic impact on other components. Inspection Report 50-461/96009 documented that repetitive failures of Feedwater System containment isolation check valves had not been adequately addressed to prevent reoccurrence. A Severity Level III violation was issued for the failure to correct check valve leakage. An apparent violation for inadequate corrective actions related to maintenance of safety related breakers was identified in Inspection Report 50-461/97003 (EA 97-132). Many of the referenced problems with breaker maintenance had been identified and addressed in a non-integrated manner using MWRs.

#### Indications of Effectiveness

The inspectors reviewed the licensee's Material Condition Management Program "Trend Report" for January 1997. This report documented that trending of vibration data was being performed and that some repetitive component failures were being documented and dispositioned. The inspectors' review of CRs initiated during the inspection period supported the observation that repetitive failures of a component within a three month period were being documented on CRs.

### Programmatic Concern

The inspectors noted that the licensee's corrective action program did not require that material condition deficiencies identified on MWRs be reviewed for generic application or repetitiveness (with the exception that CRs were required to be written when MWRs indicated that a system or component failed twice within a three month period). Degraded material conditions identified on MWRs were also not subject to root cause analysis to prevent reoccurrence. The inspectors were concerned that the failure to perform adequate assessment of material condition problems identified on MWRs could lead to future equipment reliability or operability problems.

### Status of issues at the Conclusion of the Period

The inspectors requested that the licensee evaluate whether the failure of PosiSeal butterfly valves in service water systems, breaker failure due to faulty synch check relays, and MOV lubricant degradation were generic or repetitive material condition problems, and to provide the maintenance history and trending data which supported the conclusions. The inspectors consider the effectiveness of the licensee's process for identifying and preventing recurring material condition problems which were adverse to safety to be an **unresolved item (50-461/97011-10)** pending review of the licensee's maintenance history and trending data and the licensee's corrective actions for degraded safety related breakers (Inspection Report 50-461/97003).

#### c. Conclusions

The inspectors noted material condition problems with PosiSeal butterfly valves in service water systems, synch check relays in safety related breakers, and lubricants in MOVs. The licensee's response to these issues appeared to be focused on repairing the specific problems, not on assessing potential repetitive or potential common mode failure mechanisms, or on preventing recurrences. The inspectors were also concerned that material condition problems identified on MWRs received limited review for generic implications. An unresolved item was opened pending review of more detailed material history and trending data and the licensee's response to a pending enforcement action.

### M2.5 Control of Transient Material in Containment

#### a. Inspection Scope (71707)

The inspectors performed reviews of generic correspondence on Emergency Core Cooling System (ECCS) suction strainer clogging and performed walkdowns of containment to identify whether the licensee's housekeeping and transient material programs were adequate and properly implemented.

b. Observations and Findings

While performing walkdowns of the containment, the inspectors identified several items of potential concern. These included:

- Peeling and degraded coatings on the containment walls
- The use of double backed tape and magnets to hold signs and placards in place within containment
- The extensive use of caution tape and foam insulation as an occupational safety and health precaution for permanently installed interferences within containment
- The extensive use of radiological tape and glued or self-adhesive labels on systems and structures in containment
- The use of paper (fibrous) caution and maintenance request tags in containment
- The poor housekeeping control over old wires, tape, and general debris in some portions of containment.

The inspectors reviewed Procedure CPS 1019.05, "Control of Transient Equipment/Materials," Revision 3, and found that it did not address many of the items discussed above. The inspectors also found that while the procedure specified limits for transient materials in containment, there was no specified implementation process to ensure that the cumulative amount of transient material from all sources would be below the licensee identified threshold for proper ECCS strainer operation in a post loss of coolant accident (LOCA) environment.

The inspectors discussed the above issues with the Licensing and Engineering staffs. The inspectors requested information on the environmental qualification of the coatings and adhesives used in containment, and the documented analysis that the presence of large amounts of flexible and semi-rigid material in containment did not represent an undue potential challenge to the ECCS strainers. The licensee's initial response referenced strainer design type considerations rather than the implementation of ongoing controls. At this time, the inspectors reviewed an Engineering Evaluation associated with CR 1-96-10-033, "Foreign Material in Suppression Pool Area of Drywell," and found that the CR also focused on design considerations for ECCS strainers rather than on-going operability considerations.

The inspectors identified their concerns to licensee management who, after discussion with the inspectors and independent walkdowns of containment, acknowledged that Procedure CPS 1019.05 was inadequate for the control of material which could cause clogging of ECCS strainers under post LOCA conditions. This conclusion was documented in CR 1-97-05-178. The following CRs regarding ECCS strainer clogging were also written subsequent to the inspectors involvement with this issue; 1-97-05-014, 1-97-05-184, and 1-97-05-232.

10 CFR Part 50, Appendix B, Criterion V, "Procedures," requires, in part, that activities affecting quality be prescribed by procedures of a type appropriate to the circumstances. CPS 1019.05, Revision 3, Section 8.8, was not appropriate to the circumstances in that it failed to identify or provide for adequate control for material which could clog ECCS strainers in a post LOCA environment, a violation (50-461/97011-11) of 10 CFR Part 50, Appendix B, Criterion V.

The licensee informed the inspectors that they had initiated procurement of environmentally qualified (EQ) adhesives and labels for use in containment at the end of the inspection period. The licensee also initiated revision of Procedure CPS 1019.05 to ensure that it adequately identified and controlled material which could cause ECCS strainer clogging. The licensee had not provided the inspectors an assessment of the impact of degraded containment coatings, or a corrective action plan, at the end of the inspection period.

c. Conclusion

The inspectors identified that the licensee procedure for controlling material which could clog ECCS strainers in a post LOCA environment was inadequate. After a slow initial response to this issue, the licensee initiated actions to resolve the concern. The issue of degraded containment coatings had not been resolved at the end of the period. One violation of NRC requirements was identified.

M3 Maintenance Procedures and Documentation

M3.1 Documentation Contained Within Maintenance Packages

a. Inspection Scope (62707)

The inspectors reviewed Job No. PEMAP1054, "8410.04 Testing for 1AP41E2C," MWR D63102, "Install New Control Switches for Bridge," MWR D70531, "Red Pen Sticks at 100%," D71601, "Transmitter is Sending a Low Flow Signal to DCS Computer," and CR 1-96-12-124, "Questionable Breaker Not Removed From System."

b. Observations and Findings

On December 11, 1996, the technicians tested MCCB 1AP41E2C using Job No. PEMAP1054. The individuals could not find the stamp which contained information concerning the breaker revision; therefore, they used Procedure CPS 8410.05, "Type HE Molded Case Circuit Breaker Revision Level Test," Revision 4, to determine the breaker revision. When the breaker appeared not to reset within five seconds, the technicians marked the surveillance as failed and turned over to the next shift personnel for disposition. The engineering personnel of the next shift found the stamp and the breaker revision on the face of the breaker. Therefore, Procedure CPS 8410.05 was not re-performed. Procedure CPS 8410.04 was then performed satisfactorily. Detailed resolution and evaluation of this breaker's failure

to reset within five seconds were documented in the MWR. In addition, CR 1-96-12-124 was initiated on December 13, 1996 to document this discrepancy and resolution.

A note between Steps 8.10 and 8.11 in Procedure CPS 8410.05 stated, "Within  $\approx$  5 seconds of breaker trip, manually reset breaker by opening then attempt to close breaker to verify trip was due to instantaneous trip unit. If breaker will not latch closed, trip was influenced by the thermal trip unit and can not be considered a valid instantaneous trip." Step 8.11 stated, "If breaker trips, reset breaker and close if possible within  $\approx$  5 second after trip." When the technicians observed that the breaker did not reset within 5 seconds on December 11, this condition showed that the trip was due to a thermal and not an instantaneous trip. Therefore, the breaker trip was not a valid instantaneous trip. The inspectors reviewed the completed Job No. PEMAP1054 and did not find the documentation associated with Procedure CPS 8410.05. The licensee stated that the reasons not to include documentation associated with Procedure CPS 8410.05 were:

- Procedure CPS 8410.05 was not a required test because the date and revision of the breaker were subsequently identified.
- The failure of the breaker to reset within 5 seconds was not a valid failure but showed that further testing was necessary to determine the instantaneous trip set point.

The licensee committed to change the procedure to clarify that breaker revision was determined by a valid instantaneous trip.

The inspectors agreed that the documentation of Procedure CPS 8410.05 of December 11, 1996, did not need to be included in the maintenance package. However, a violation of 10 CFR Part 50, Appendix B, Criterion V was identified during review of testing associated with MCCB 1AP41E2C (Section M2.1).

c. Conclusion

The inspectors did not identify any violations during a review of Job No. PEMAP1054.

M3.2 Environmental Qualification (EQ) Documentation of Material

a. Inspection Scope

The inspectors reviewed Procedure CPS 8492.01, "Cable Termination," Revision 21. The review included checklists associated with this procedure, and Nuclear Station Engineering Department Maintenance Standards for Raychem material.

b. Observations and Findings

The inspectors reviewed each section of Procedure CPS 8492.01 to verify the type and qualification of materials specified for Class 1E components. Procedure CPS 8492.01 required the use of Raychem kits for Class 1E cable insulation or termination and the use of either Raychem kits or Okonite tape for non-1E applications. The Raychem materials specified in the procedure were EQ for 40 years except for Raychem NPKX and NPKP kits. These two kits were not included in the Nuclear Station Engineering Department Maintenance Standards manual. The licensee determined that these two kits were also EQ, but were not included in the manual. The licensee committed to initiate a CR and revise the manual.

c. Conclusion

The inspectors concluded that for all Class 1E applications, the licensee appeared to use EQ qualified materials in accordance with CPS 8492.01.

M3.3 Review of Maintenance Work Package for the Reactor Water Cleanup System

a. Inspection Scope (62703)

The inspectors reviewed maintenance work request (MWR) D71146 for the reactor water cleanup discharge inboard isolation valve for conformance with the requirements of CPS 1501.02, "Conduct of Maintenance."

b. Observations and Findings

Operations personnel wrote MWR D71146 to replace the packing on valve 1G33F053. While reviewing the work package, the inspectors identified that both EM and quality verification (QV) had signed MWR Job Step 8 for replacing parts on the valve's motor operator per Procedure CPS 8451.05. The inspectors reviewed the work package and determined that the only part replaced was the limit switch cover gasket.

The inspectors reviewed Procedure CPS 8451.05, "Corrective Maintenance for Limitorque SMB-000 and SMB-00 Actuators," and determined that the procedure did not specifically address the replacement of the limit switch cover gasket. However, Procedure CPS 8451.50, "Motor Operated Valve Testing with VOTES," which maintenance used to test the valve after the packing was replaced (Job Step 12), contained a specific step for replacing the limit switch cover gasket if necessary.

QV personnel explained to the inspectors that the replacement of the limit switch cover gasket could be performed using either procedure because some activities were covered within more than one procedure. Further discussions with QV supervision determined that signing multiple job steps when the activity performed was covered by more than one procedure was not isolated.

Since EM and QV personnel did not perform work using Procedure CPS 8451.05 as directed by Job Step 8, Procedure CPS 1501.02, "Conduct of Maintenance," required that Job Step 8 be noted as "not applicable." Procedure CPS 1501.02 also required that a note be placed in the back of the MWR stating the reason the job step was not performed. The failure to comply with Procedure CPS 1501.02 constituted a violation of minor significance and is being treated as a **Non-Cited Violation (50-461/97011-12)** consistent with Section IV of the NRC Enforcement Policy. See Section M7.1 for additional discussion of this issue.

c. Conclusions

Both maintenance and QV personnel signed that work was completed using Procedure CPS 8451.05 when it was actually completed using Procedure CPS 8451.50.

**M7 Quality Assurance in Maintenance Activities**

M7.1 Sensitivity to Quality Record Sign-offs

Sections M1.2 and M3.2 of this report document instances where Quality Record sign-offs were completed for actions slightly different than actually performed. While each case was individually minor, the general issue is of regulatory significance. The inspectors discussed, with plant management, the need to ensure that Maintenance and Nuclear Assessment personnel were appropriately sensitive concerning the accuracy of their sign-offs. Plant Management acknowledged the importance of such sensitivity.

M7.2 QV Sign-off Missed

a. Inspection Scope

On September 17, 1996, a step requiring notification of Quality Verification (QV) personnel was added in Procedure CPS 8492.01C001, "Cable Termination Checklist," by Procedure Advance Change (PAC) 0496-96. The inspectors were concerned that necessary QV activities were not specified in Procedure CPS 8492.01, "Cable Termination" and its associated checklist CPS 8492.01C001. The inspectors reviewed revisions of Procedures CPS 8492.01, CPS 8492.01C001 and Nuclear Assessment Procedure (NAP) 110.02, "Quality Verification Planning."

b. Observation and Findings

Step 2.1.3 in Procedure CPS 8492.01, Revision 20, required the use of the cable termination checklist (Procedure CPS 8492.01C001, Revision 9), when maintenance was performed on safety and quality related systems. The checklist contained eight QV signature blocks for various steps in the procedure.

On August 26, 1996, Procedures CPS 8492.01, Revision 21 and CPS 8492.01C001, Revision 21 (Revisions 10 through 20 were not used) were issued.

Step 5.4 in Procedure CPS 8492.01 required notification of QV personnel before the performance of this procedure on any Class 1E system or component when QV was called out on the Authorizing Work Document. In addition, this notification was to be treated as a QV witness allowing for verification deemed appropriate for the scope of work being performed. This practice was consistent with NAP 110.02. Step 8.1.2.1 of the procedure also required use of the checklist for all work performed by this procedure. However, Revision 21 of the checklist did not contain a QV signoff for personnel to denote QV inspection. Therefore, the licensee issued PAC 0496-96 to add signoffs for notifications of QV before performing this procedure on Class 1E systems or components.

Although the signoff for QV personnel was not in Procedure CPS 8492.01C001, Revision 21, from August 26 to September 17, 1996, the inspectors had reasonable assurance that necessary QV activities were performed on Class 1E systems or components because Step 5.4 in CPS 8492.01, Revision 21, was still in effect. In addition, any QV requirements would be denoted in work packages as deemed necessary.

c. Conclusions

The inspectors concluded that from August 26 to September 17, 1996, QV activities were performed on Class 1E systems even though sign-offs for QV inspections were not in Procedure CPS 8492.01C001 checklist.

M7.3 Review of Maintenance Critiques

a. Inspection Scope (40500)

The inspectors reviewed Critiques PS 97-009 and EM 97-010 against the requirements of Procedure CPS 1016.05, "Conduct and Documentation of Critiques."

b. Observations and Findings:

Critique PS 97-009

On April 9, 1997, the inspectors observed maintenance work on the "C" RHR pump. The mechanics had started to remove a drain plug from the seal cooler for the pump and noted that service water to the seal cooler was still pressurized. The mechanics reinstalled the drain plug, stopped work, and notified their supervision of the problem. The licensee initiated CR 1-97-04-072 to document the problem, and that a tagout error had occurred. The inspectors attended the critique, held April 9, 1997, and reviewed the critique report, Critique PS 97-009, issued April 30, 1997.

During the critique, the licensee determined that the tagout performed for the work failed to consider the work being performed on the service water side of the seal cooler, and that the mechanics failed ensure that the tagout was adequate as required by Procedure CPS 1014.01, "Safety Tagging." These conclusions were

appropriately documented in the critique report. The inspectors determined that the licensee's conclusion regarding the primary cause of the error was appropriate.

The failure to adequately prepare or implement the tagout for the RHR C seal cooler, as required by Procedure CPS 1014.01, was considered a violation of minor significance and is being treated as a **Non-Cited Violation (50-461/97011-13)** consistent with Section IV of the NRC Enforcement Policy.

The inspectors noted that relevant facts established during the critique were not documented in the critique report. Specifically, having multiple tasks on a single work document contributed to the failure to identify work on the service water side of the seal cooler when the tagout was developed. The failure to document this could have led to missed opportunities for desirable corrective actions.

#### Critique EM 97-010

Critique EM 97-010 reviewed the circumstances of the MOV damage discussed in Section M1.3.

The inspectors noted that the critique report stated that no apparent procedure noncompliance or non-conservative operations had occurred during the event. The inspectors discussed this determination with several individuals who attended the critique. The inspectors found that the determination of no noncompliance and no non-conservative operations focused heavily on the procedure in use at the time of the event. Individuals at the critique placed little emphasis on determining if requirements delineated in administrative procedures such as "Conduct of Maintenance" should have prevented the event. As discussed in Section M1.3, the inspectors identified one noncompliance related to "Conduct of Maintenance." The inspectors were concerned that this narrow focus reflected inadequate sensitivity to, and familiarity with, administrative maintenance requirements.

#### c. Conclusions

The inspectors reviewed two Maintenance critiques and noted opportunities for improvement in each.

### Ili. Engineering

#### E1 **Conduct of Engineering**

##### E1.1 Attachment of Scaffolding to Safety-Related Piping Not Analyzed

###### a. Inspection Scope (37551)

The inspectors observed scaffolding attached to safety-related equipment. The inspectors reviewed the scaffolding attachment for adequacy of analysis and

adequacy of the scaffolding procedure, Procedure CPS 8901.10, "Scaffold Erection/Use/Dismantling," Revision 0.

b. Observations and Findings

During a tour of the RHR "B" pump room, April 28, 1997, the inspectors observed that scaffolding was attached to the minimum flow line for the RHR "B" pump and one of the pipe supports for the line. The inspectors reviewed Procedure CPS 8901.10 and determined that the procedure permitted the observed scaffolding attachment. Specifically, Step 8.3.19.6 and Appendix G of Procedure CPS 8901.10 stated that it was acceptable to attach scaffolding to pipes of 4 inches diameter and greater. However, in response to questions by the inspectors, engineering personnel stated that no evaluation had been performed which demonstrated that the attachment of the scaffolding would not cause undue stress upon safety-related piping during a seismic event. Design engineering initiated CR 1-97-05-035 to document that no evaluation had been performed and to document the inadequacy of Procedure CPS 8901.10 and Procedure CPS 1019.05, "Control of Transient Equipment/Materials," Revision 3. In addition, the licensee inspected other scaffolding in the plant and identified additional examples of scaffolding attached to safety-related equipment. 10 CFR Part 50, Appendix B, Criterion V, "Procedures," requires in part that activities affecting quality be prescribed by procedures appropriate to the circumstances. The failure of the procedure to require and evaluation of the additional stress upon the RHR "B" pump minimum flow line piping is a violation (50-461/97011-14) of 10 CFR Part 50, Appendix B, Criterion V.

c. Conclusions:

The inspectors identified that the licensee failed to analyze or evaluate the loads on safety related piping induced by temporary scaffolding. One violation of 10 CFR Part 50, Appendix B, Criterion V, was identified.

E1.2 Seismic Qualification of Circuit Breaker Cabinets

a. Inspection Scope (37551)

The inspectors reviewed the circumstances associated with implementation of a procedure for controlling the seismic configuration of safety related circuit breaker cabinets.

b. Observations and Findings

The licensee identified that the seismic qualification of safety related breaker cabinets had been based upon having breakers in each bay of the cabinet. Breakers were typically removed from their bays for performance of preventive maintenance or repair. The licensee identified that the removal of the breaker's weight from the cabinet affected the critical characteristics of the cabinet during a potential seismic

event, and that this had the potential to place the cabinet's other safety related breakers in an unanalyzed condition.

The licensee reviewed the original seismic qualification process and performed some additional analysis to establish criteria for conditions in which the removal of breakers from their bays would not affect the operability of the other breakers in the cabinet. The identified criteria was compiled into Procedure CPS 1014.11, "6900/4160/480V Switchgear/Circuit Breaker Operability Program," Revision 0, issued May 2, 1997.

On May 5, 1997, the licensee recognized that the 480V 1A unit substation had been in non-compliance with the requirements of Procedure CPS 1014.11 since the procedure was issued. In addition, a combination of breaker removals performed prior to May 2 and on May 5, 1997, placed the Division 1 4160V switchgear into a condition of non-compliance with Procedure CPS 1014.11. Both electrical cabinets were promptly declared inoperable, and CRs were written to document the inadequate implementation planning associated with the issuance of Procedure CPS 1014.11. Corrective actions included the commitment to walk down field conditions prior to implementation of new procedures and implementation of a method to track the status of individual breakers within the safety related switchgear. The failure to ensure that the 480V 1A unit substation and the 4160V Division 1 switchgear were in compliance with Procedure CPS 1014.11 was licensee identified and corrective actions were considered appropriate, therefore it is being treated as a **Non-Cited Violation (50-461/97011-15)** consistent with Section VII.B.1 of the NRC Enforcement Policy.

The inspectors concluded that the licensee exhibited a good safety focus in identifying the breaker cabinet seismic qualification issue. However, the inspectors were concerned that the licensee appeared to be using probabilistic risk assessment in determining operability criteria. Such an approach would be inconsistent with the definition of operability contained in TS, and discussed in Generic Letter 91-18. The inspectors were also concerned with the past operability of safety related switchgear. These concerns were forwarded to the Office of Nuclear Reactor Regulation for review, and are considered an **inspection follow-up item (50-461/97011-16)** pending a NRC review of the licensee's analysis of electrical cabinet seismic qualifications and the suitability of the operability control program established in Procedure CPS 1014.11.

c. Conclusions

The licensee identified a potentially generic concern associated with the seismic qualification of circuit breaker cabinets when breakers are removed. The inspectors concluded that the licensee exhibited a good safety focus by identification of this issue. The implementation of a procedure to address this issue was inadequate, and a procedure violation resulted. The inspectors identified concerns with the licensee's stated approach to assessing cabinet operability, and a follow-up item was opened pending NRC review of this issue.

#### IV. Plant Support

### R1 Radiological Protection and Chemistry (RP&C) Controls

#### R1.1 Minor Weakness in Using Small Article Monitor (SAM-9) Identified

##### a. Inspection Scope (83750)

The inspectors observed several personnel use the SAM-9 to release personal items from the radiological controlled area (RCA).

##### b. Observations and Findings

The inspectors observed a member of the licensee's staff exit the turbine building and then stop to converse with another staff member who was waiting in line to use the SAM-9. The inspectors left the area after monitoring several small articles and continued to exit the RCA by processing through the personnel contamination monitors (PCMs). Prior to the inspectors successfully processing through the PCM, the two individuals discussed above exited the SAM-9 area and entered the PCMs. Because of the short time which had elapsed, the inspectors were confident that the individual who was not in line to use the SAM-9 had failed to monitor his personal items.

The inspectors immediately notified a radiation protection (RP) technician who confronted the individual prior to exiting the RCA. The individual stated that he had forgotten to use the SAM-9 prior to entering the PCM area. The individual then returned to the SAM-9 area and processed his item through the monitor. No contamination was found. The RP technician reminded the individual of the purpose of the SAM-9 and reinforced the need for attention to detail. No violations occurred since the individual was reminded to use the SAM-9 prior to him exiting the RCA.

##### c. Conclusions

One example of licensee personnel not immediately processing personal items through the SAM-9 was identified.

#### R1.2 Contamination Controls Not fully Implemented

##### a. Inspection Scope

The inspectors observed an individual reach into a contaminated area without protective clothing. The inspectors assessed the individual's actions and reviewed applicable procedure requirements.

b. Observations and Findings

On May 8, 1997, the inspectors observed an individual, inside containment, leaning into a posted contaminated area and reaching out to turn a metal valve label inside the contaminated area. Although the individual handled the label, the individual was not wearing gloves nor any other protective clothing. The licensee had defined the activities being performed by the individual as being under a "C" radiological classification. The licensee subsequently held a fact finding meeting, documented on CR 1-97-05-100, which confirmed the inspectors observations.

Section 6.0 of Procedure CPS 1024.02, "Radiological Work Control," Revision 4, specified that personnel performing radiological work were not permitted to deviate from established radiological control requirements without specific written or verbal guidance from responsible radiation protection personnel. Radiation Worker Information Sheet (RWIS) 5.6, "Minor Radiological Risk Work Rules for Mechanical Maintenance," dated January 14, 1997 specified radiological control requirements activities with a "C" radiological classification. Instruction 7 of RWIS 5.6 specified that protective clothing be worn for entry into Contamination Areas. The failure to wear protective clothing in a contaminated area was contrary to RWIS 5.6 and CPS 1024.02, and is considered a violation (50-461/97011-17) of Technical Specification (TS) 5.4.1.

c. Conclusions

The inspectors observed that radiological controls were not properly implemented when an individual reached into a contamination area without protective clothing. One violation of procedures was identified.

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 May 23, 1997. 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.

## INSPECTION PROCEDURES USED

IP 37551: On-site Engineering  
IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems  
IP 61726: Surveillances  
IP 62703: Maintenance Observation  
IP 62707: Maintenance Observation  
IP 71707: Plant Operations  
IP 71750: Plant Support  
IP 83750: Occupational Exposure  
IP 92700: Onsite Follow up of Written Reports of Nonroutine Events at Power Reactor Facilities  
IP 92902: Followup - Engineering  
IP 92903: Followup - Maintenance  
IP 93702: Prompt Onsite Response to Events at Operating Power Reactors

## ITEMS OPENED, CLOSED, AND DISCUSSED

### Opened

50-461/97011-01	VIO	failure to perform steps as written
50-461/97011-02	NCV	inaccurate VD system drawings
50-461/97011-03	VIO	failure to lock open EDG support system valves
50-461/97011-04	NCV	quality record sensitivity
50-461/97011-05	VIO	inadequate shift turnover
50-461/97011-06	VIO	no restoration on caution tag
50-461/97011-07	NCV	incorrect performance of surveillance actions
50-461/97011-08	VIO	failure to complete an impact matrix
50-461/97011-09	VIO	breaker preconditioning
50-461/97011-10	URI	identifying material condition issues
50-461/97011-11	VIO	control of loose material in containment
50-461/97011-12	NCV	quality record sensitivity
50-461/97011-13	NCV	inadequate tagout
50-461/97011-14	VIO	scaffolding loads on safety related piping
50-461/97011-15	NCV	seismic qualification of switchgear
50-461/97011-16	IFI	assessment of electrical cabinet operability
50-461/97011-17	VIO	contamination controls

### Closed

50-461/97011-02	NCV	inaccurate VD system drawings
50-461/97011-04	NCV	quality record sensitivity
50-461/97011-07	NCV	incorrect performance of surveillance actions
50-461/97011-12	NCV	quality record sensitivity
50-461/97011-13	NCV	inadequate tagout
50-461/97011-15	NCV	seismic qualification of switchgear

PERSONS CONTACTED

Licensee

W. Connell, Vice President

W. Romberg, Assistant Vice President

P. Yocum, Manager - Clinton Power Station

D. Thompson, Manager - Nuclear Station Engineering Department

R. Phares, Assistant to the Vice President