U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/92006(DRP)

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

Licensee: Illinois Power Company
500 South 27th Street
Decatur, IL 62525

Facility Name: Clinton Power Station

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: March 17 - April 30, 1992

Inspectors: P. G. Brochman
F. L. Brush
J. A. Hopkins
E. R. Duncan
C. E. Carpenter
A. T. Gody, Jr.

Approved By: Roger D. Lanksbury, Chief
Reactor Projects Section 3B

5/19/92
Date

Inspection Summary:

Inspection from March 17 through April 30, 1992 (Report No. 50-461/92006(DRP))
Areas Inspected: Routine, unannounced safety inspection by the resident, region, and headquarter inspectors of licensee actions on previous inspection findings, operational safety, engineered safety feature walkdown, refueling activities, spent fuel pool storage, cold weather preparations, control of overtime, silting in the SX-RHR cross connect, post accident sampling system design deficiency, RCIC storage tank overflow, maintenance and surveillance, shroud head bolt replacement, inoperable containment isolation valve, motor operated valve activities, inoperable safety valve, security, radwaste operators training, system engineer program, licensee self assessment activities, reliable decay heat removal, licensee event reports, and management changes.
Results: Of the 21 areas inspected, no violations or deviations were identified in 20 areas; 1 violation was identified in the remaining area: (failure to follow technical specifications with an inoperable containment isolation valve - Paragraph 5.c). However, in accordance with 10 CFR Part 2, Appendix C, Section VII.B.1, a Notice of Violation was not issued. One unresolved item was identified relating to the operability of the SX-RHR cross connect - Paragraph 3.g.

The following is a summary of the licensee's performance during this inspection period:

Plant Operations

- The inspectors identified degradation of an o-ring on a main steam safety relief valve discharge line vacuum breaker. The licensee discovered that this had also happened to several other vacuum breakers. The licensee concluded there was no safety impact on plant operations

- An engineered safety feature (ESF) actuation occurred when instrument air containment isolation valves went closed during restoration from a surveillance procedure. There was no impact on the plant.

- The licensee's efforts to remove scale from the condenser tubes were successful. Approximately 65 to 80 tons of scale were removed. The licensee installed additional temperature and pressure instrumentation inside the condenser to more accurately model condenser performance. Thermal performance of the condenser will be monitored during plant startup.

- Refueling activities were very good. No problems were observed in the performance of contractor or licensee personnel during the inspection period. Several minor, recurring, equipment failures occurred on the refueling machines. Also a grapple was damaged when it was caught on the high pressure core spray sparger.

- No problems were identified in the storage of items in the spent fuel pool.

- Administrative control of overtime was effective; though one instance of failing to document management approval was identified.

- Excessive silting in the cross connect between the shutdown service water (SX) and residual heat removal systems (RHR) was identified. The licensee's initial response to this issue was slow; however, subsequent actions were adequate. The NRC will perform further reviews of the safety implications of this problem (URI 461/92006-01(DRP)).

Radiological Controls

- The presence of liquid in a reactor coolant system dissolved gasses sample in the post accident sample system created the potential for an overexposure Detailed calculations showed this was unlikely. NRC review of the calculations will be performed (OPN 461/92003-01(DRSS)).

- The licensee's efforts at cleaning up the spill from the overflow of the reactor core isolation cooling system storage tank were quite good.

Maintenance/Surveillance

- Continuing degradation of reactor vessel shroud head bolts was detected. Seven bolts were removed this outage. Three of those were replaced.

- Operations personnel failed to recognize that with a containment

isolation valve inoperable during surveillance testing that Technical Specification 3.6.4 required that it be closed during core alterations. This was not done. Because of the minor safety significance and the licensee identification of the issue, no notice of violation was issued.

- Problems occurred during the performance of maintenance on motor operated valves. The licensee's effects to correct the problem were successful.

- Chilled water system relief valve, 1WO0570B, was discovered to have plastic plugs installed on its suction and discharge flanges, rendering it inoperable. The licensee's analysis concluded this was of minor safety significance.

Security

- The licensee was effective in using canine units to search for prohibited items.

Engineering and Technical Support

- The licensee experienced problems completing continuing training in 1991 for the radwaste operations center operators. Efforts to correct this problem have been successful.

- A review of the system engineer program indicated improvement in communications and annual reports. The biggest problem continues to be the large backlog of design activities.

Safety Assessment and Quality Verification

- A review of the licensee's self-assessment activities did not indicate any weaknesses.

- The licensee's efforts to ensure reliable decay heat removal during the outage were effective and thorough.

- Corrective actions taken to close out licensee event reports were effective.

DETAILS

1. Persons Contacted

Illinois Power Company (IP)

*J. Perry, Vice President
*J. Cook, Manager - Clinton Power Station (CPS)
*J. Miller, Manager - Nuclear Station Engineering Department (NSED)
*R. Wyatt, Manager - Quality Assurance
F. Spangenberg, III, Manager - Licensing and Safety
*R. Morgenstern, Manager - Training
*J. Palchak, Manager - Nuclear Planning and Support
*L. Everman, Director - Radiation Protection
*P. Yocum, Director - Plant Operations
*W. Clark, Director - Plant Maintenance
*R. Phares, Director - Licensing
*K. Moore, Director - Plant Technical
*W. Bousquet, Director - Plant Support Services
*C. Elsasser, Director - Planning & Scheduling
S. Hall, Director - Nuclear Program Assessment
*J. Sipek, Supervisor - Regulatory Interface
*J. O'Brien, Supervisor - Independent Safety Engineering Group
*D. Korneman, Director - Systems and Reliability, NSED
*R. Kerestes, Director - Engineering Projects, NSED
*J. Langley, Director - Design and Analysis, NSED

The inspectors also contacted and interviewed other licensee and contractor personnel during the course of this inspection.

*Denoted those present during the exit interview on April 30, 1992.

2. Action on Previous Inspection Findings (92702)

a. (Closed) Open Item (461/91007-02(DRP)): Potential for the relative proximity of the hydrogen recombiner containment penetrations to create a short-circuiting of the recombiner process. The inspectors had requested that NRR[1] evaluate this issue. NRR concluded that this issue was not of concern (letter from J. A. Zwolinski to E. G. Greenman, dated March 27, 1992), based upon the presence of the hydrogen igniters and the three percent allowance taken for the design basis accident maximum metal water reaction. Based on this evaluation, the inspectors have no further concerns. This issue is closed.

b. (Closed) Open Item (461/91009-02(DRS)): Clinton Power Station (CPS) procedure 2103.01, "Centrifugal Pump Performance", Revision 3, was a generic centrifugal pump test procedure and was not specifically written for the construction fire pump. Procedure CPS 9071.05, "Horizontal Diesel Fire Pump Capacity Test," was developed to address

[1] USNRC Office of Nuclear Reactor Regulation

this concern. The inspectors have reviewed this procedure and have no further concerns on this issue. This item is closed.

c. (Closed) Violation (461/90002-01(DRP)): Failure to perform a 10 CFR 50.59 review when changing the method of determining the liquid level in the radwaste sludge tank. Corrective actions for this violation included: performing a safety evaluation, training radwaste personnel, procedure changes, and a design change to replace the existing tank level instrumentation. The inspectors have reviewed the licensee's corrective actions and have no further concerns. This violation is closed.

3. Plant Operations

The unit was shutdown the entire report period for its third refueling outage (RF-3).

a. Operational Safety (71707)

The inspectors observed control room operation, reviewed applicable logs, and conducted discussions with control room operators during March and April 1992. During these discussions and observations, the inspectors ascertained that the operators were alert, cognizant of plant conditions, attentive to changes in those conditions, and that they took prompt action when appropriate. The inspectors verified the operability of selected emergency systems, reviewed tagout records, and verified the proper return to service of affected components. Tours of the circulating water screen house and auxiliary, containment, control, diesel, drywell, fuel handling, rad-waste, and turbine buildings were conducted to observe plant equipment conditions, including potential fire hazards, fluid leaks, and excessive vibrations, and to verify that maintenance requests had been initiated for equipment in need of maintenance.

The inspectors observed plant housekeeping and cleanliness conditions and verified implementation of radiation protection controls. The inspectors also witnessed portions of the radioactive waste system control associated with rad-waste shipments and barreling.

The inspectors verified by observation and direct interviews that the physical security plan and all other activities were being implemented in accordance with the requirements established under Technical Specifications, Title 10 of the *Code of Federal Regulations*, and administrative procedures.

(1) Safety Relief Valve Vacuum Breakers

The inspectors identified, during a tour of the drywell, that an o-ring on a main steam safety relief valve (SRV) discharge line vacuum breaker appeared to be damaged. The licensee determined that the o-rings on a number of other SRV vacuum breakers were also damaged. The licensee's analysis concluded that the cause of the damage was valve

mechanical action and that the damaged o-rings did not impair the valves' operability. The licensee replaced the damaged o-rings on readily accessible vacuum breakers. The inspectors have reviewed the licensee's actions and have no further concerns.

(2) Containment Instrument Air Isolation

At 2:30 p.m. on April 25, 1992, the instrument air (IA) containment isolation valves (1IAF005 and 1IAF0006) inadvertently closed during the restoration steps of procedure CPS 9433.03, "ECCS Reactor Vessel Water Level 1B21-N091A Channel Calibration." This was an engineered safeguard feature (ESF) actuation. There was no impact upon the plant and the valves were subsequently reopened. An unrelated event on these valves is discussed in Paragraph 5.c. The inspectors will review this event further after the licensee event report (LER) is issued.

(3) Main Condenser Thermal Performance

During RF-3, the licensee initiated a major effort to improve the thermal performance of the main condenser. There were three major aspects to this initiative. The first involved the removal of calcium carbonate scale from the condenser tube. This was done with specially designed cutters and scrapers which were hydrostatically shot through the tubes. The licensee estimated that it removed approximately 65 to 80 tons [59.0 to 72.6 t (metric tons)] of scale from the tubes. The second involved installation of additional temperature and pressure monitors, both inside and outside the condenser tube bundles, to obtain more accurate modeling of condenser and air removal performance. The third aspect involved the monitoring of Clinton lake water to determine more effective water treatment techniques to prevent the buildup of scale. The inspectors have monitored the licensee's activities and have no concerns.

b. Engineered Safety Features System Walkdown (71710)

The inspectors performed a walkdown of the low pressure core spray (LPCS) system to verify its status. The inspectors verified that valves, circuit breakers, and switches were in their correct position for existing plant conditions; hangers and supports were properly made up; valves were operable and did not have excessive packing leakage; instruments were installed, functioning, and calibration dates were current; and local and remote position indicators agreed. No discrepancies were identified regarding component position or material condition.

c. Observation of Refueling Activities (71707)

The inspectors observed refueling activities and verified that personnel were knowledgeable and alert, proper communications were used, technical specification surveillances were current,

radiological controls were implemented, and housekeeping and material controls were in place. As in previous refuelings, fuel movements were performed by General Electric (GE) personnel, with licensee personnel providing oversight and support functions. From an overall perspective, the inspectors concluded that the licensee's performance had improved and that previous areas of weakness had been addressed. The inspectors noted that the licensee's use of administrative personnel to maintain the tag boards, was very effective.

The inspectors verified that the mode switch was in the refuel position, required source range nuclear instruments were operable, communications were in place, refueling machine and inclined fuel transfer system interlocks were verified, radiation monitors were operable, secondary containment was set, and water level was maintained at least 23 feet [7.0 m (meters)] above the reactor flange. Personnel verified the correct bundle number before grappling and records and tag boards were properly updated. The inspector also reviewed a quality assurance (QA) audit on refueling activities.

Three minor problems occurred during refueling activities. First, repetitive failures of the mast travel switches on both the containment and fuel handling building refueling machines occurred. Second, the new take-up reel for the electrical cable for the containment refueling machine's grapple did not spool correctly. Third, an air hose and electrical cable to the grapple were damaged when they caught on the high pressure core spray sparger. All of the broken parts were recovered from the reactor vessel, except for a small piece from an amphanol connector. General Electric completed an analysis for the licensee and concluded that the lost part would have no impact on reactor safety. The licensee intended to review the design of the take-up reel and will procure travel switches with more reliable parts.

The inspectors did not identify any concerns.

d. Storage of Items in the Spent Fuel Pool (86700)

The inspectors reviewed the licensee's procedures and policies to determine if appropriate controls were in place for storing items other than fuel in the spent fuel pool (SFP). Based on interviews, procedure reviews, and visual inspections of the SFP, the inspector determined that neutron startup sources were stored in the spent fuel storage racks and used detectors from incore neutron monitoring systems were stored in a bucket in the cask storage pool. Items such as temporary lighting were removed after refueling activities were completed. Other items would be evaluated on a case by case basis.

A fuel inventory was conducted after refueling activities were completed. No discrepancies were identified. The neutron detectors, considered special nuclear material by CPS procedure No. 1898.00, were last inventoried in January 1992. No discrepancies were identified. No specific inventory, audit, or

inspection of items in the SFP was required or performed.

This specific review was performed in response to a Region I Technical Issue Summary (TIS) No. 91-16, dated September 25, 1991. The inspectors have no further concerns at this time and this issue is considered closed.

e. Cold Weather Preparations (71714)

The inspectors reviewed the licensee's cold weather preparations performed in October 1991. They included preventative maintenance procedures to drain ventilation cooling coils and operation procedures to check heat tracing. The inspectors have no concerns in this area.

f. Administrative Control of Overtime (71707)

The inspectors reviewed the licensee's administrative control of overtime during RF-3 (AMS RIII-92-A-0035). A sampling of the time sheets for operations department personnel (including managers) and Stone and Webster Engineering Corporation (SWEC) contractor personnel were reviewed for periods in February and March 1992.

Clinton Power Station (CPS) Administrative Procedure CPS No. 1001.10, revision 3, "Control of Working Hours," defined the licensee's requirements for approving overtime in excess of the requirements of Technical Specification 6.2.2.f. CPS 1001.10 required that approval be obtained from the plant manager (or designee) before the excessive overtime was worked. However, Paragraph 8.3 allowed the documentation of this approval to be completed by the end of the month in which the deviation was worked. Approval was documented on CPS form 1001.10F001.

The inspectors reviewed the completed forms and verified through discussions with plant management that prior approval had been obtained in each instance. The inspectors did identify one instance in which a licensee manager worked in excess of 72 hours in a 7 day period. The individual's overtime was approved; however, it was not documented on a CPS 1001.10F001 form. This problem was reviewed with licensee management. The inspectors have no further concerns and these issues are considered closed.

g. Excessive Silting In The Shutdown Service Water To Residual Heat Removal System Cross Connect

On January 14, 1992, the inspectors identified a concern to the licensee relating to the possible blockage of the flow path through the cross-connect from the shutdown service water system (SX) to the residual heat removal (RHR) "B" train (AMS RIII-92-A-0008). This flow path would allow the licensee to flood the reactor vessel, drywell, and containment with lake water as a last resort, backup, method during a loss-of-coolant accident; and would only be used after multiple failures of redundant safety systems.

Valve 1E12F095 was a solenoid operated valve that drained the volume

between motor operated isolation valves 1E12F094 and 1E12F096 (see figure 1). A functional test of valve F095 was performed as part of the in-service testing (IST) program. This was accomplished by procedure CPS 9053.04, "Residual Heat Removal A/B/C Valve Operability Checks." The drain line was 0.75 inches [1.91 cm] in diameter; while, the main line was 4 inches [10.2 cm] in diameter. The last time that the F095 valve and drain line were demonstrated to function properly was on May 7, 1990. The licensee believed that the drain line was plugged, but that the main flow path was not. Consequently, since the IST procedure could not be followed by observing water draining out of the F095 valve after the F094 and F096 vales were stroked, the F094 and F096 valves were declared inoperable and administratively tagged shut. However, the licensee believed that the main flow path was not blocked and was capable of injecting water into the reactor vessel.

The inspectors asked the licensee if the flow path was considered operable. The licensee stated that this flow path was not required by Technical Specification 3.7.1.1 and that there was no surveillance activity to test its flow capability. The licensee stated it would be very difficult to determine if the main flow path was blocked. Subsequently, the licensee commenced troubleshooting of valve F095 on January 21, 1992, and determined that the solenoid was energized, but that the valve stem was not moving. On January 22, the licensee decided to demonstrate the flow path was not obstructed by injecting cycled condensate water through valve F348 and thence into the RHR system. The flow path from the SX system was then checked by introducing SX water through the F094 and F096 valves and out valve F0348. Mud and silt were found in the line; however, it was not totally obstructed. On February 1 and 2, 1992, the licensee cut out valve F095 and the piping leading to it and replace both with identical equipment.

Subsequently, the licensee decided to radiograph the main flow line during RF-3. The radiograph indicated that the 4 inch [10.2 cm] line was completely filled with silt, except for an approximate 0.75 inch [1.91 cm] channel. The inspectors believed that the channel was created during the flushing in January 1992. The size of the channel equated to the size of the flush path piping leading to the F0348 valve. The results of the radiograph indicating a potential "silt trap" in the piping. Therefore,the licensee's engineering department developed a design modification to install a 2.5 inch [6.4 cm] flushing connection between valves F094 and F096. The modification was scheduled to be installed before the end of RF-3.

The inspectors reviewed the maintenance history for the F095 valve and determined that a maintenance work request (MWR) was initiated in May 1990, to troubleshoot and repair the valve. This work had been rescheduled several times since then. When the inspectors initially raised their concerns on this issue, they were told that the MWR was scheduled for the fourth refueling outage (RF-4) beginning in September 1993. When the inspectors asked why the work could not be done now, they were told that the MWR had been classified as requiring an SX outage and hence was scheduled for RF-4. However, the licensee realized that this was not necessary and rescheduled the

work to be performed immediately.

Technical Specification 3.7.1.1.b required that the SX loops shall be operable in Operational Conditions 1 through 5. Each operable shutdown service water loop shall be comprised of . . . an operable flow path capable of taking suction from the ultimate heat sink and transferring water through the associated systems and components that were required to be operable. The Clinton updated safety analysis report (USAR), section 9.2.1.2.1.1.c., defined one of the design purposes of the shutdown service water system as flooding the drywell and containment (via the reactor vessel) through the use of RHR piping, if required following a postulated loss-of-coolant accident. Consequently, the inspectors believed that this flow path was required to be operable.

Further review of the safety significance of this issue and the timeliness of the licensee's identification and corrective actions will be reviewed in a subsequent report and will be tracked as Unresolved Item (461/92006-01(DRP)).

h. Discussions With Operations Management on Past Performance

The inspectors discussed the performance of the operations department, over the past year, with licensee management. Areas where the licensee viewed performance had improved were:

- The quality of operating procedures.
- The initiatives to improve teamwork, and communications were effective.
- Operation staffing levels were increased to support a six shift rotation.
- The non-license operator training program was very effective.

Areas where performance had declined, not improved, or improvement was not satisfactory were:

- Operator complacency tended to develop during long periods of sustained power operations.
- The shift supervisors perspective of the big picture needed to improve.

No violations or deviations were identified. One unresolved item was identified.

4. Radiological Controls

a. Design Deficiency In The Post Accident Sample System

On March 17, 1992, the licensee identified a potential design

deficiency in the post accident sample system (PASS). This deficiency was documented in condition report 1-92-03-041 and involved liquid being unintentionally collected in the vial for primary coolant dissolved gasses. This issue was reviewed by a regional specialist inspector and further details are contained in inspection report 461/92003.

b. Reactor Core Isolation Cooling (RCIC) System Storage Tank Overflow

At 9:15 a.m. on April 13, 1992, the RCIC storage tank overflowed approximately 6000 gallons of water when a fill valve failed to close. The RCIC storage tank was outdoors and had a dirt containment berm. There was approximately 7000 gallons of rain water already in the berm, at the time of the event. Radiation protection (RP) personnel immediately cordoned off the area, sampled the water for activity and made preparations to pump the water into the fuel building floor drain system. The activity of the water in the berm was $2x10^{-6}$ $\mu Ci/cm^3$ [$7.4x10^{-2}$ Bq/cm^3 (becquerel)] for Mn_{54} (manganese) and $3.5x10^{-6}$ $\mu Ci/cm^3$ [$1.3x10^{-1}$ Bq/cm^3] for Co_{60} (cobalt). This was consistent with the activity of the water in the tank. The berm was sampled after the water was pumped out. Its activity was $1.6x10^{-6}$ $\mu Ci/cm^3$ [$5.9x10^{-1}$ Bq/cm^3] Mn_{54} and $3.9x10^{-6}$ $\mu Ci/cm^3$ [$1.4x10^{-1}$ Bq/cm^3] Co_{60}. The berm was pumped out two more times due to the accumulation of rainwater. Additional berm samples were then taken and the activity was consistent with normal background readings. The RP personnel response was good and the inspectors have no further concerns in this area.

No violations or deviations were identified.

5. Maintenance and Surveillance (61726 & 62703)

a. Observations Of Work Activities

Station maintenance and surveillance activities of both safety-related and nonsafety-related systems and components listed below were observed or reviewed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, industry codes or standards, and in conformance with Technical Specifications.

Document	Activity
D36090	Weld repair on "C" MSIV guide rib.
D23420	Replacement of Safety Relief Valve 1B21F047D.
D09906	Install modification on valve 1B21F022C. Install modification on valve 1B21F022D.
D09913	Inspect the 'A' LP turbine last stage blading.
D27306	Division I Battery Replacement. Local Leak Rate Test on 1B21F010A.
D23648	Main Steam Isolation Valve Maintenance.
9861.03	
8216.11	

The following items were considered during this review: the limiting conditions for operation were met while affected components or systems were removed from and restored to service; approvals were obtained prior to initiating work or testing; quality control records were maintained; parts and materials used were properly certified; radiological and fire prevention controls were accomplished in accordance with approved procedures; maintenance and testing were accomplished by qualified personnel; test instrumentation was within its calibration interval; functional testing and/or calibrations were performed prior to returning components or systems to services; test results conformed with Technical Specifications and procedural requirements and were reviewed by personnel other than the individual directing the test; any deficiencies identified during the testing were properly documented, reviewed, and resolved by appropriate management personnel; work requests were reviewed to determine the status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which may affect system performance.

b. Shroud Head Bolt Replacement (62703)

In the previous refueling outage, the licensee observed abnormal wear on certain shroud head bolts. The bolts were evaluated by the licensee and the reactor vendor (General Electric) and the licensee determined that four bolts should be removed and that the rest of the bolts could be used for another cycle. The shroud head bolts were, in effect, reach rods from the top to the bottom of the steam separator and allowed for remote operation of the shroud head studs. They also served as captivating devices for the shroud head studs. The shroud head studs hold the steam separator down on the core shroud flange. There were 28 studs on the steam separators. The minimum number necessary was 12. The four shroud head studs, with shroud head bolts removed, were engaged with the core shroud; however, no credit was taken for their presence, since the captivating function of the shroud head bolt was not available.

During this inspection, it was determined that the wear had increased. The licensee removed seven bolts and replaced three with new bolts. Wear was observed on the locking splines, the bolt retainer pin, and in the area of the lower support ring of the bolts removed. The inspectors monitored the activities associated with the underwater welding to repair and replace these bolts. The licensee will continue to inspect the shroud head bolts each refueling outage. The inspectors did not identify any concerns.

c. Failure To Follow Containment Isolation Valve Technical Specification (LER 92005)

On March 20, 1992, control and instrument (C&I) technicians were performing routine surveillances on reactor vessel level transmitter 1B21-N091F and analog trip module (ATM) 1B21-N691F to verify the Level 1 isolation signals. The unit was in Operational Condition 5, with core alterations in progress. Since the isolation logic for containment isolation instrument air valves 1IA006 and 1IA007 was one

out of one, the isolation links were to be removed to preclude the valves from inadvertently closing during the surveillance.

Assistant shift supervisors and the "B" reactor operator had reviewed the surveillance package. They did recognize that this made valves IA006 and IA007 inoperable; however, they did not recognize that Technical Specification (TS) 3.6.4, Table 3.6.4.-1, Item 1.28, required that the valves to operable in Operational Conditions 1,2,3 and # (Condition # was defined as core alterations being in progress).

Work was authorized on the transmitter and ATM and the isolation links to valves IA006 and IA007 were removed at 11:00 a.m. At 6:15 p.m., the swing shift C&I crew requested the assistant shift supervisor's permission to continue work (this was not required by the licensee's program). During this review, operations personnel recognized that the # sign operational condition impacted on TS 3.6.4. At 6:45 p.m., the shift supervisor suspended core alterations because the four hour action statement of TS 3.6.4 had not been met. However, core alterations had already been stopped at 6:30 p.m. due to equipment problems. The C&I technicians were directed to complete the surveillance and reinstall the isolation links. By 8:23 p.m., the C&I technicians had completed the surveillance and reinstalled the isolation links. Core alterations remained suspended to allow performance of routine refueling surveillances.

The licensee conducted a critique and identified two principal factors as the root cause for the event. First, the impact matrices for the transmitter and ATM surveillance procedures did not recognize an impact on TS 3.6.4 when core alterations were in progress. Second, the one out of one isolation logic was unique to these containment isolation valves and required the removal of the isolation links to perform the surveillance.

The licensee implemented the following corrective actions for this event:

- The impact matrixes for the affected procedures were revised to reference TS 3.6.4.
- Other response time surveillances were reviewed for interactions between # sign evaluations and TS 3.6.4.
- Affected response time surveillances were rescheduled outside # sign conditions for RF-3.
- RF-2 records were reviewed to determine if the same problem had occurred before.
- Pending procedure revision, caution tags were hung on the instrument air isolation links to alert personnel to the impact of TS 3.6.4.
- An evaluation was made on changing the isolation logic for

the instrument air valves.

Technical Specification 3.6.4, Table 3.6.4-1, Item 1.28, required that valve 1IA006 be operable in Operational Condition # or else either restore the valve, isolate the penetration within four hours, or suspend core alterations. Valve 1IA006 was inoperable from 11:10 a.m. to 6:30 p.m. on March 20, 1992, with core alterations in progress. The failure to isolate the penetration or suspend core alterations within four hours was a violation of Technical Specification 3.6.4. However, because the licensee identified this problem, no notice of violation will be issued.

d. Motor Operated Valve (MOV) Maintenance Activities

During the course of this outage the inspectors have noted four condition reports which identified personal errors during MOV work. This area appeared to be having more problems than all other areas of maintenance activity. The inspectors discussed this concern with maintenance department management. They agreed that this area had the most problems. Some of the errors were related to past performance (two instances of mixed grease in nonsafety-related MOVs); others related to current performance (two instances of mixed grease and one of improper removal of limit switches). All of these problems were identified by craft personnel. The licensee attributed the present performance problems to new and inexperienced contractor personnel. The errors occurred as MOV activities were just beginning during RF-3 and increased management attention and training appeared to correct the problem. Contributing to the problems was the late identification of the Generic Letter 89-10 required testing and the late acquisition of the *VOTES* test equipment.

During RF-3, the licensee had worked on 370 MOVs out of a total population of approximately 510. There were four aspects to this work.

- Preventative maintenance (PM) tasks, including: cleaning and inspection of limit switches, actuator grease, meggering of the motor, and replacing environmental qualification (EQ) seals.
- Corrective maintenance.
- *MOVATS* testing as part of the routine PM program.
- *MOVATS* and *VOTES* testing as part of Generic Letter 89-10 activities.

From an overall perspective, the inspectors have concluded that the MOV program improved and that the *VOTES* testing was very effective at identifying problems. The inspectors observed several *VOTES* tests of MOVs and the personnel seemed very knowledgeable of their task. Personnel were also sensitive to the adjustment of torque switches on valves that had been local leak rate (LLRT) tested. Areas where performance could be improved were in the training of contractor

workers and in the scheduling of *VOTES* and LLRT tests of containment isolation valves. The concerns identified by the inspectors have been addressed by the licensee.

e. Inoperable Relief Valve

On April 20, 1992, chilled water (WO) relief valve 1WO570B was removed to verify its setpoint as part of the IST program. However, when the valve was removed the licensee discovered that plastic cleanliness plugs were installed in the inlet and outlet flanges. This rendered the valve inoperable. The licensee believed that this condition had existed since original construction. The WO system was nonsafety-related and provided supplemental cooling to the containment and drywell. However, valve 1WO570B was safety-related. Because WO piping isolates during a loss of coolant accident (LOCA), pressure inside the pipes could rise due to the rise in containment and drywell temperature. The purpose of valve 1WO570B was to relieve this pressure in the WO piping .

Additionally, when valve 1WO570B was tested it did not actuate within its required setpoint. The only other valve of a similar type in the plant was 1WO570A. The IST program required that other valves, in that particular class, be removed and tested. No plastic cleanliness plugs were found and the valve lifted at the correct setpoint. The licensee's analysis of this event concluded it was an isolated case, of minor safety significance, and that the failure of the WO piping, in the post-LOCA environment, would not worsen the accident nor affect the licensee's ability to mitigate it.

In an unrelated aspect, the inspector noted that the condition report for this event, 1-92-04-058, was classified incorrectly as nonquality-related by the corrective action review board (CARB). The inspectors discussed this with the CARB members and determined that they had classified this condition as nonquality-related after checking that the valve type was nonsafety-related and knowing that the WO system was nonsafety-related. However, the valve list indicated the valve was safety-related. This was due to its location inside containment. The inspectors discussed with the CARB the need to accurately classify condition reports. The inspectors have no further concerns. These issues are closed.

f. Discussions With Maintenance Management on Past Performance

The inspectors discussed the performance of the maintenance department over the past year with licensee management. Areas where the licensee viewed performance had improved were:

- The corrective maintenance backlog was reduced to the licensee's goal and material condition had improved.

- The availability of emergency diesel generators and emergency core cooling systems improved significantly.

- The licensee's initiatives to improve teamwork, sense of ownership, and communications were effective and decisions were made at lower management levels.

- Implementation of ALARA (as low as reasonably achievable) initiatives in dose equalization and projection, for maintenance activities were quite successful.

Areas where the licensee viewed performance had declined, or not improved were:

- The backlog of planned maintenance activities was excessive.

- The trending of equipment problems and failures had some significant program weaknesses.

The inspectors believed that the licensee's weaknesses with gathering information on equipment problems and failures, combined with information systems that were very difficult to manipulate, was the most significant weakness in the maintenance and surveillance programs. The licensee's information management system was very difficult to use to sort classes of equipment for problems, as compared to looking at an individual component. Some examples of methods which could show or distort the equipment history data bases were: multiple equipment failures occurred on a single MWR for one component, corrective maintenance was performed under preventative maintenance documents, and suspending a surveillance to perform corrective maintenance on a component and then resuming the surveillance, without treating that action as a surveillance failure.

No deviations were identified. One non-cited violation was identified.

6. Security (71707)

On March 19, 1992, the licensee arranged for two canine units from the Illinois State Police to conduct a random search of selected work areas inside of the protected area. The inspectors observed portions of the searches. No contraband was found. The inspectors believed the licensee's approach was positive and have no further concerns.

No violations or deviations were identified.

7. Engineering and Technical Support

a. Review Of The Training Program For Radwaste Operations Center (ROC) Operators

The inspectors met with training and radwaste management to discuss the continuing training program for ROC operators. The inspectors reviewed various aspects of the ROC operators' training program, including: training and development plans for generic and specific training, curriculum review committee meeting minutes, the training

plan for cycle 92-1,selected courses from the training plan, and ROC operators' requests for specific training.

The licensee experienced problems last year in completing a significant portion of the continuing training. This was due to a shortage of radwaste personnel, which caused management to utilize a four section rotation. The decrease in personnel was caused by a decision to downsize combined with higher than expected attrition rate. This was compounded by a management decision to require new personnel to complete the non-licensed operator (NLO) course, which was taught once a year. The combination of these factors resulted in a 13 month period needed for an operator to qualify. Currently, the licensee had increased staffing levels and was utilizing a five section rotation. This now allowed for a 5 week training cycle.

To address the length of time it took to train an operator in 1991, the training department developed a self-study course. This course allowed an individual to become qualified in 4 to 6 months.

An additional impact of the lowered staffing levels was the need, on numerous instances, to work overtime above the guidelines of Generic Letter 82-12.

The inspectors did identify an unrelated weakness. That was in the ability to sort training records for required training against a class of individuals who had the training. This was a weakness which was inherent in the licensee's main frame computer, which can identify all of the training ever taken by one individual, but can't easily identify the training taken by a class of individuals. The inspectors discussed the weakness with training department management. No other concerns were identified.

b. Review Of The System Engineer Program

The inspectors reviewed 15 of the system engineers' annual reports. The inspector observed significant improvement in the overall quality and usefulness of the annual reports. Some reports needed further work while others were quite excellent.

The system engineer program has been in existence for 4 years. The inspectors interviewed six system engineers to obtain their perspective on the program. The knowledge level of systems had improved. All of the system engineers agreed that communications between themselves and the plant operators, maintenance craft, and maintenance planners had improved significantly. They also viewed that communications inside of the engineering department had improved. The majority did not identify any significant weaknesses in the program. Two minority concerns were stated. The first related to the system engineers' involvement in the design change process, especially as related to post modification testing. The second related to the availability of design resources and the length of time before some design activities could be completed. This subject is discussed further below. The inspectors discussed these concerns with licensee management.

c. Discussions With Engineering Management on Past Performance

The inspectors discussed the performance of the engineering department, over the past year, with licensee management. Areas where the licensee viewed performance had improved were:

- Good progress was made in the initiative to transition to an in-house design capability. Quality of design products had improved and productivity goals were exceeded.

- Inservice inspection activities were performed very effectively during RF-3, both from a schedule and results standpoint.

- Sharp reductions in many of the backlogs in the engineering department occurred. This included areas such as drawing changes, reviewing vendor manual changes, and reviewing procurement documents.

- Morale issues such as teamwork, sense of ownership, and communications have improved.

Areas where the licensee viewed performance had declined, or not improved were:

- Prioritization of work was ineffective. The ability to load schedules with manpower needs was weak.

- Engineering aspects of the corrective action program, including: integration of equipment reliability and trending program, availability of historical information, and determination and implementation of permanent fixes to problems.

- Improving the design change and modification programs, including: broadening the design engineer's understanding of the plant's design bases, improved understanding of costs of modifications (especially manpower), and continuing the upgrading of design documents.

The inspectors believed that the engineering department's two biggest problems were in weak work prioritization combined with a considerable backlog of plant problems; and in ensuring that the reliability engineering function received the information necessary to identify equipment problems before they became failures. The licensee stated that at the beginning of 1991, the backlog was approximately 250 activities. The backlog was now reduced to 190 issues. Additionally, a backlog of over 70 unevaluated requests for modifications was reduced to less than 5. The inspectors discussed concerns with the backlog of design changes and modifications with engineering management.

No violations or deviations were identified.

8. Safety Assessment and Quality Verification

a. Evaluation of Licensee Self Assessment Activities (40500)

The inspectors evaluated several of the programs in the licensee's self-assessment activities.

The inspection of the licensee's Independent Safety Engineering Group (ISEG) included a review of recent ISEG reports, a sample of their corrective actions recommendations, ISEG composition, expertise, and experience levels, and recommendation tracking. The inspectors also observed an ISEG meeting and interviewed several of its members.

The ISEG reports generally provided a thorough, in-depth review of areas selected and timely and valid recommendations for improvement. Corrective actions for the recommendations were timely and appropriate.

The inspectors inspected two third-party reviews in the area of licensee self assessment. They were the Licensing and Safety assessment of Generic Letter 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance" and "Electrical Distribution System Functional Inspection". The Licensing and Safety assessments were clear in their analysis.

The ISEG members' qualifications were adequate. There was one vacancy in the group due to the staffing requirements of the third refueling outage.

The inspectors have no concerns in this area.

b. Reliable Decay Heat Removal During Outages (2515/113)

An inspection of the licensee's planning for RF-3 activities to ensure reliable decay heat removal was performed in Inspection Report 461/92002(DRP). The inspectors conducted a followup review using guidance contained in Temporary Instruction (TI) 2515/113, "Reliable Decay Heat Removal During Outages," to assess the implementation of the licensee's program.

The inspectors observed the licensee implementing its programs for ensuring reliable decay heat removal during daily briefings and outage meetings. The inspectors observed a daily outage schedule review meeting where emergency power and decay heat removal system availability were discussed. The ISEG also identified a second window of increased vulnerability during its review of the schedule and the licensee subsequently delayed selected activities until the problems were obviated. The inspectors also observed the licensee's efforts to ensure secondary containment integrity through control of hose and electrical leads through secondary containment boundaries.

The inspectors concluded that the licensee's implementation was conservative and very effective at minimizing risk to the core. Based on this review, the inspectors have no further concerns; and TI 2515/113 is considered closed.

c. Licensee Event Report Follow-up (90712 & 92700)

Through direct observation, discussions with licensee personnel, and review of records, the following licensee event reports (LER) were reviewed to determine that the reportability requirements were fulfilled, immediate corrective action was accomplished, and corrective action to prevent recurrence had been accomplished in accordance with Technical Specifications.

LER	Title
89019	Electrical Equipment Fails To Meet Environmental Qualification Requirements.
90007	Deenergization Of Division II Nuclear System Protection System Bus.
91002	Loss Of Service And Instrument Air.
92004	Containment Isolation During Circuit Card Installation.

No violations or deviations were identified.

9. Management Changes

On March 21, 1992, Mr. S. Razor, Director - Plant Maintenance, was promoted to plant manager, at one of the licensee's fossil units. Mr. W. Clark, Assistant Director - Plant Maintenance, assumed his position.

10. Non-Cited Violation

During this inspection, certain of the activities, as described above, appeared to be in violation of NRC requirements. However, the licensee identified this violation and it is not being cited because the criteria specified in Section VII.B. of the "General Statement of Policy and Procedures for NRC Enforcement Actions," (Enforcement Policy, 10 CFR Part 2, Appendix C (1992), were satisfied. The following non-cited violation (NCV) was identified and reviewed during the inspection period: failure to suspend core alterations when a containment isolation valve was inoperable (see Paragraph 5.c.).

11. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, violations, or deviations. One unresolved item disclosed during the inspection is discussed in paragraph 3.g.

12. Exit Interview

The inspectors met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection on April 30, 1992. The inspectors summarized the purpose and scope of the inspection and the findings. The inspectors also discussed the likely informational content of the

inspection report, with regard to documents or processes reviewed by the inspectors during the inspection. The licensee did not identify any such documents or processes as proprietary.

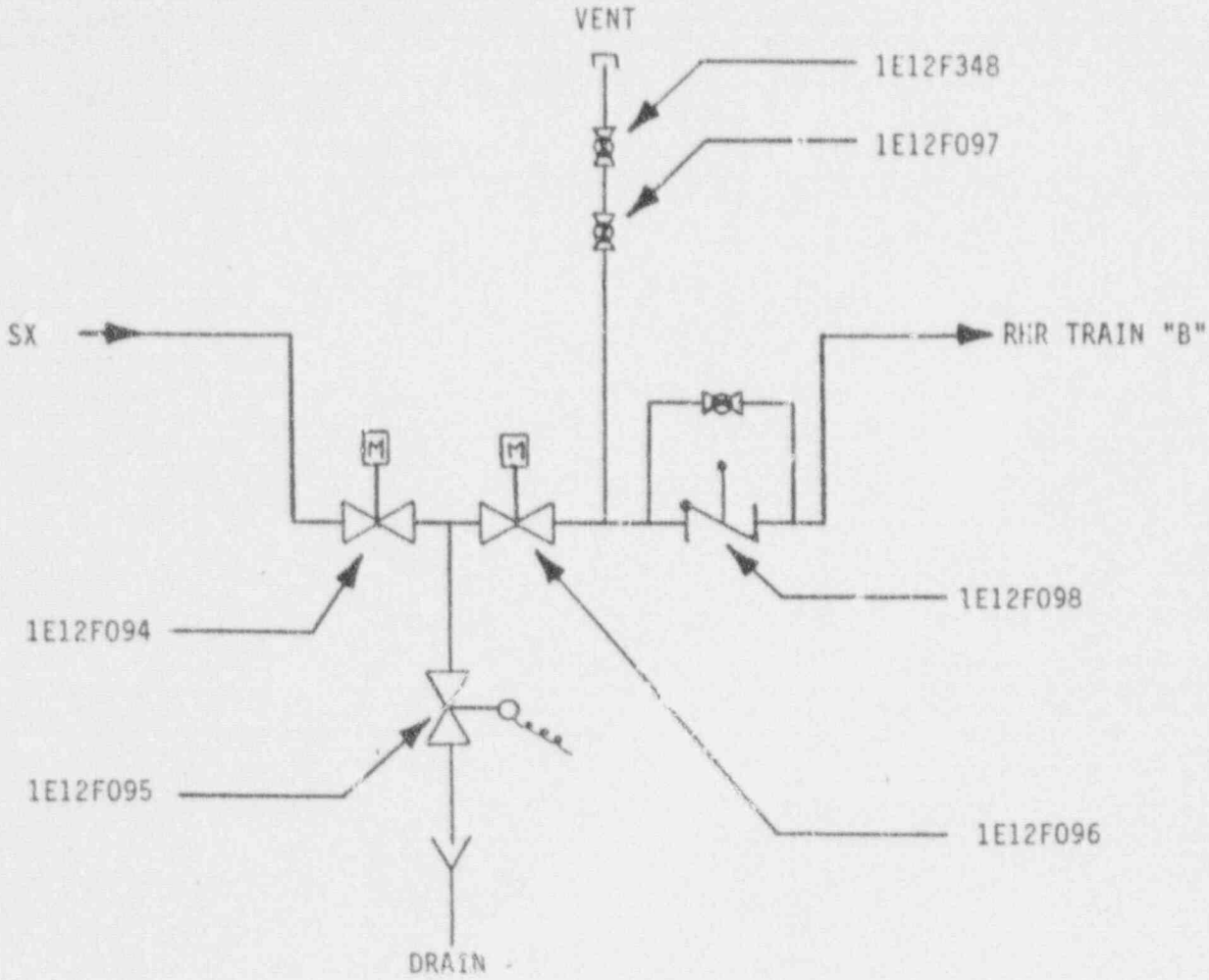
VENT
1E12F348
1E12F097
SX
RHR TRAIN "B"
1E12F094
1E12F098
1E12F095
1E12F096
DRAIN

Figure 1