

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-461/92002(DRP)

Docket No. 50-461

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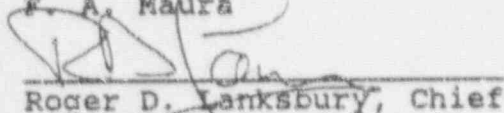
Licensee: Illinois Power Company
500 South 27th Street
Decatur, IL 62525

Facility Name: Clinton Power Station

Inspection At: Clinton Site, Clinton, Illinois

Inspection Conducted: February 4 - March 16, 1992

Inspectors: P. G. Brochman
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Approved By: 
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Reactor Projects Section 3B

MAR 27 1992

Date

Inspection Summary

Inspection from February 4 - March 16, 1992. (Report No. 50-461/92002(DRP))

Areas Inspected: Routine, unannounced safety inspection by the resident and region based inspectors of licensee actions on previous inspection findings, event follow-up, operational safety, maintenance and surveillance, security, engineering and technical support, self-assessment programs, 10 CFR Part 21 activities, decay heat removal during outages, management changes, and management meetings.

Results: No deviations were identified; however, one non-cited violation was identified (paragraph 2.f). One unresolved item was identified relating to the separation of electrical cables in some safety-related panels (paragraph 6.a).

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

Plant Operations

- The operators performed well during the feedwater transient and subsequent reactor trip.
- The spurious closure of valve OAS099A was determined to be due to problems with electrical relays and not due to tampering.

- The licensee's efforts to control the use of cranes and prevent the loss of offsite power circuits appeared to be effective.
- There were no problems observed during fuel receipt and inspection.

Maintenance/Surveillance

- Maintenance and surveillance activities in the first part of the third refueling outage (RF-3) were performed well. An engineered safety feature (ESF) actuation occurred during reinstallation of a circuit card.
- Removal of reactor vessel internals went very well. The licensee has successfully resolved problems from previous refueling outages.

Security

- An auxiliary operator lost a key ring containing a vital area key. The NRC was notified of the event within the one hour time requirement. The key ring was found and no compromise of security occurred.

Engineering And Technical Support

- Two instances were identified where the separation criteria between divisional and non-divisional electrical cables were not met. This problem was believed to have existed since original construction. The licensee had established a plan to resolve this issue. (URI 461/92002-01(DRP))
- The licensee discovered the first significant infestation of asiatic clams (*Corbicula sp.*) in the intake bays of the circulating water screen house. The concentration of the clams was greater than 1000 per ft², with the size of the clams between 12 and 17 millimeters.

Safety Assessment And Quality Verification

- The performance of the nuclear review and audit group (NRAG) remained very good and they were considered highly effective.
- The licensee has corrected weaknesses identified in its program to review 10 CFR Part 21 reports and has satisfactorily incorporated revisions to the rule promulgated in October 1991.
- The licensee has done a thorough job researching the issue of decay heat removal during outages and has implemented adequate guidelines. Evidence of a conservative operating

philosophy was evident in both the development and implementation of the guidelines.

- The issue discussed in paragraph 2.f indicated that the licensee's staff did not understand the relationship between the nonsafety-related room cooler fan and the operability of the containment and reactor vessel isolation control system (CRVICS) delta temperature instrument channels. This resulted in several instances where Technical specification requirements were unknowingly exceeded. This was a non-cited violation.

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 (NSEO)
- *R. Wyatt, Manager - Quality Assurance
- *F. Spangenberg, III, Manager - Licensing and Safety
- R. Morgenstern, Manager - Nuclear Training
- *J. Palchak, Manager - Nuclear Planning and Support
- D. Miller, Director - Plant Radiation Protection
- *P. Yocum, Director - Plant Operations
- S. Rasor, Director - Plant Maintenance
- *R. Phares, Director - Licensing
- *K. Moore, Director - Plant Technical
- *W. Bousquet, Director - Plant Support Services
- *C. Elsasser, Director - Planning & Scheduling
- *J. Langley, Director - Design & Analysis
- *D. Korneman, Director - Systems and Reliability Engineering
- *M. Lyon, Director - Emergency Preparedness
- *D. Holtzer - Director, Nuclear Safety
- *W. Clark, Assistant Director - Maintenance
- *L. Everman, Assistant Director - Radiation Protection
- *P. Scardigno - Maintenance Assessor
- *S. Hall, Director - Nuclear Program Assessment
- *J. Sipek, Supervisor - Regulatory Interface
- *J. O'Brien, Supervisor - Independent Safety Engineering Group

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 March 16, 1992.

2. Action on Previous Inspection Findings (92702)

- a. (Closed) Open Item (461/86066-02(DRS)): Licensee's justification of long term corrosion rates of the unpainted containment liner surface, behind the leak chase channels, when the channel plugs were removed. The inspector reviewed the licensee's calculation for liner corrosion rates (No. SDQ12-42DG11), performed by Sargent & Lundy Engineers, and had no further concerns regarding this issue.
- b. In Inspection Report 461/88021, paragraph 3.a., the inspectors closed Licensee Event Report (LER) 461/87006 based on the licensee's implementation of Field Alteration SPF017. The LER and subsequent field

alteration dealt with the undetected failure of certain fuses in the nuclear system protection system's (NSPS) circuit cards. The undetected failure of the blown fuse allowed one of the four NSPS channels to be in a tripped condition. When a surveillance was performed on a second channel, the coincidence logic was satisfied and an engineered safety feature (ESF) actuation occurred. The field alteration was designed to install a loading resistor across the fuse; thereby making fuse failures detectable. The fuse was intended to provide protection to the logic card from faults and surges propagating back up the output conductor, such as lightning strikes.

The licensee has decided not to implement SPF017. This was based on a new mean time between failures (MTBF) study, which estimated that fuse failures would occur not more often than once every 8.8 years. Normal surveillance testing has a maximum interval of six years. Consequently, the normal surveillance tests performed on these circuit cards should detect any failures before they occur; thereby preventing an ESF actuation. Also, the licensee believed that most of the initial fuse failures were from infant mortality and that since the actual current carried by the fuses was significantly less than the fuse's capacity (0.005 versus 0.25 amps), the failure rates should be less than the MTBF study. The licensee has documented this analysis in a memo from J.A. Miller to F.A. Spangenberg (Y-98373). The inspectors have reviewed the licensee's analysis and concluded that it was reasonable and have no further concerns with this issue. This LER remains closed.

- c. (Closed) Unresolved Item (461/91007-01(DRP)): Offsite chemical hazard not analyzed in the Updated Safety Analysis Report (USAR). This issue involved chemicals which were stored at a farm service company, 2.5 miles east-northeast of the site. These chemicals had not been analyzed for their impact on the habitability of the main control room. The licensee analyzed all of the chemicals stored at the facility and determined that, except for ammonia, they were in small enough quantities to not require a detailed analysis.

The licensee performed a detailed analysis of the risk from ammonia and determined that, under certain conditions, it was possible for toxic concentrations to occur in the main control room within two minutes of exposure. The licensee performed more detailed analysis and determined that the probability of this occurrence was 5×10^{-8} per reactor year. This was less than the

standard review plan,¹ Section 2.2.3, limit of (1×10^6) , which required that an accident be incorporated into the plant's design basis. Consequently, the licensee concluded that no further actions need be taken. The NRC office of Nuclear Reactor Regulation (NRR) reviewed the licensee's analysis and concluded it was acceptable. This was documented in a letter from J. N. Hannon to E. G. Greenman, dated February 13, 1992. Based on the NRR review, this item is considered closed.

- d. Inspection Report 461/91018, paragraph 3.b.3, discussed an event in September 1992, when the reactor core linear heat generation rate (LHGR) thermal limit was exceeded. The licensee's immediate corrective actions included a standing order which required that the line assistant shift supervisor and the shift technical adviser (STA) review and initial all core thermal limits (P1) computer reports within 15 minutes of printing. The P1 report was generated and printed hourly. Additionally, the STA's training requirements related to nuclear engineering activities were reviewed.

The licensee completed a human performance enhancement system (HPES) evaluation of the event. The HPES report recommended that the requirement that the operations shift personnel initial the P1 reports be reevaluated. Operations personnel were briefed on the importance of reviewing reports and the practice of initialing P1 reports was no longer required. The Nuclear Station Engineering Department (NSED) issued an instruction on January 27, 1992, to provide guidance to the nuclear engineers (NE) regarding the reactor conditions necessitating NE coverage and leaving written instructions for operations personnel. The licensee determined that it was not necessary to send the STAs to nuclear engineering training. The inspectors reviewed the licensee's corrective actions and have no further concerns in this area.

- e. Inspection report 461/91018, paragraphs 4.a and b, discussed problems with microbiologically induced corrosion (MIC) in the Division I and II emergency diesel generator's (DG) heat exchangers. As part of a program to improve the material condition of the facility, the licensee has identified the 10 most critical areas. The first area addressed was the chemical treatment of raw water systems, to prevent the growth of microbiological organisms and minimize general corrosion. Inspector follow-up of MIC problems in the

¹NUREG 0800, Standard Review Plan For The Review of Safety Analysis Reports For Nuclear Power Plants, LWR Division, June 1987

DG heat exchangers will be included in reviews of the raw water system's treatment; consequently, this issue is considered closed.

- f. (Closed) Unresolved Item (461/91023-01(DRP)): Two instrument channels of the containment and reactor vessel isolation control system (CRVICS) were both inoperable, due to the failure of a nonsafety-related fan. The licensee has reviewed this event and determined that the two delta temperature instrument channels were inoperable for 2.4 hours. Technical Specification 3.3.2, Action Statement c.2 only allowed two channels to be inoperable for one hour, without initiating compensatory actions.

The licensee reviewed equipment history and preventative maintenance (PM) work practices for these fans, and determined that routine lubrication had been accomplished in approximately 15 minutes. However, the fan belt replacement took 1 to 1.5 hours. This PM task had been performed seven times since initial licensing (September 1986). However, on three of these instances, the operators had entered the one hour technical specification limiting condition for operation, as the isolation function was bypassed. In the other four instances, the licensee could not determine how long the PM task had taken, but believed that it was more than one hour. Additionally, two of the PM records indicated that the fan belts were found broken, meaning the delta temperature channels were already inoperable. The maximum amount of time the fan belts could have been broken was from December 1 to 8, 1987, and from March 16 to September 1, 1991.

As corrective action, operations personnel were briefed on this event and it was added to annual regualification training. The PM tasks have been revised to indicate the time sensitivity and the technical specification interaction if the fans were inoperable.

Failure to comply with Technical Specification 3.3.2, Action c.2, is a violation. This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section V.G of the Enforcement Policy.

This item is considered closed.

- g. (Closed) Unresolved Item (461/91023-02(DRP)): Freon release inside of the control building. On November 21, 1991, maintenance personnel were installing a modification on the vent line for the chilled water (WO) system chillers. When the mechanics cut into the line, approximately 100 pounds of R-500 refrigerant was

released. The WO chillers were not safety-related and maintenance personnel had not requested a tagout. Maintenance personnel had successfully performed this modification on two other WO chillers without requiring a safety tagout.

In reviewing this event, the licensee suspected that liquid freon had been trapped in the line. However, R-500 has a saturation pressure of 85 psig at 70 °F,² the nominal temperature in the area of the chillers. Consequently, any freon inside the pipe would have been in a gaseous state. The inspectors believed that any liquid that was observed dripping from the cut pipe was either water that was condensed as the expanding freon caused a sharp temperature drop or freon that had been condensed as the temperature dropped.

The inspectors reviewed this event with maintenance department management to discuss concerns relating to the venting of this line. Personnel working on the line had believed it was vented; however, they agreed that removal of the vent cap would have been a more positive action to assure the line was vented. This event was added to the list of topics covered at the periodic maintenance safety meetings and will be repeated yearly.

The freon release did not have any operational impacts on the plant. The arrangement of the charging and vent line was unique to the WO chillers. Based on the licensee's corrective actions and that the WO chillers were not safety-related, the inspectors have no further concerns regarding this issue; and this item is considered closed.

No deviations were identified; however, one non-cited violation was identified.

3. Plant Operations

The unit operated at power levels up to 96% until 5:26 p.m. on February 27, 1992, when a reactor trip occurred on low water level (see paragraph 3.a(1)). The plant was taken to cold shutdown in preparation for the third refueling outage which started on March 1, 1992.

a. Onsite Event Follow-up (93702)

The inspectors performed onsite follow-up activities for events which occurred in February 1992. These activities included reviews of operating logs,

²American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc. (1989 ASHRAE Fundamentals Handbook, Atlanta, GA: ASHRAE, 1989) 17.29

procedures, deviation reports, licensee event reports (where available), and interviews with licensee personnel. For each event, the inspectors developed a chronology; reviewed the functioning of safety systems required by plant conditions; and reviewed licensee actions to verify consistency with procedures, license conditions, and the nature of the event. Additionally the inspectors verified that the licensee's investigation had identified the root causes of equipment malfunctions and/or personnel error. Details of each event and the licensee's corrective actions developed through inspector follow-up are provided below:

(1) Reactor Trip on Low Water Level (LER 461/92001)

At 4:55 p.m. on February 27, 1992, the reactor operator (RO) switched the feedwater level control circuit to the "B" reactor level channel, during performance of monthly CPS surveillance procedure 9538.03, "Feedwater Reactor Vessel Water Level Channel Functional". The feedwater control system sensed a step change decrease in reactor vessel level due to a four inch mismatch between the "A" and "B" channel indications. Both turbine driven reactor feed pumps (RFPs) increased speed in response to the feedwater control system. As level returned to the normal operating level, the feedwater control system sent a signal to reduce the speed of both RFPs. The "A" RFP responded as required; however, the "B" RFP did not slow down due to the steam admission valve's linkage sticking.

Operations personnel decided to take the "B" RFP off line, since it was not responding to the feedwater control system. In parallel, reactor power was being reduced to single RFP limits and an auxiliary operator was taking the "B" RFP out of service by closing the high pressure and low pressure steam supply valves. When the plant was at approximately 73% power, the "B" RFP's steam admission valve slammed shut. The "A" RFP began to speed up but did not respond quickly enough and the reactor water level began to drop.

The shift supervisor directed the RO to manually scram the reactor when water level reached 10 inches. The reactor automatically scrambled on low water level (8.9 inches) milliseconds before the RO manually scrambled the reactor. The RO did not beat the automatic scram due to time delays in updating the computer display of reactor vessel level that he was observing. All safety systems functioned as required. The unit was stabilized in hot shutdown (operational condition 3) and was subsequently taken

to cold shutdown (operational condition 4) in preparation for refueling outage RF-3.

The inspectors will perform further reviews of this event after the licensee has analyzed the cause of the RFP's abnormal response and the LER is issued.

(2) Containment Isolation During Circuit Card Replacement (LER 461/92002)

At 6:55 p.m. on March 11, 1992, six onboard drywell isolation valves inadvertently closed (a Group 11 isolation) during reinstallation of a logic circuit card in the Division II nuclear system protection system (NSPS). The card had been removed for routine surveillance testing of "untested islands". The NSPS bus had been deenergized, resulting in all of the inputs to the card being deenergized. However, the circuitry downstream of the logic card was still energized. The licensee believed that the cause of the isolation signal was either due to a static buildup on the logic card or improper installation of the front edge connector.

These valves would normally have isolated the drywell supplemental cooling system. Since the plant was in cold shutdown, there was no effect on the plant. Other equipment, which would have started, was tagged out for maintenance. The licensee's investigation was ongoing at the end of the report period. The inspectors will perform further reviews, in a subsequent report, after the LER is issued.

b. Operational Safety (71707)

The inspectors observed control room operation, reviewed applicable logs, and conducted discussions with control room operators during February and March 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, drywell, diesel, 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 was being implemented in accordance with the station security plan. The observed facility operations were verified to be in accordance with the requirements established under Technical Specifications, Title 10 of the Code of Federal Regulations, and administrative procedures.

(1) Mispositioning of Valve OAS099A

On 4:15 a.m. on December 29, 1991, the radwaste operations center received a level alarm on the "A" reboiler. A second alarm on the "B" evaporator condensate drain tank was also received. At 4:25 a.m. the evaporator condensate stop check valve to reboiler "A" (OAS099A) was found closed. The licensee's initial analysis for the valve's closure raised the possibility of tampering. The licensee investigated this possibility and determined that 13 of the 50 persons onsite could have had access to the valve's control switch. Further investigation and interviews with the individuals determined that none of them were in the area of the valve's control switch from 4:10 to 4:20 a.m.

The licensee believed that the event was caused by an electrical fluctuation in one of four Agastat relays. These relays received input from limit switches on four isolation valves in the nuclear steam to auxiliary steam pressure reducing station. The licensee had not used the nuclear steam system's capability of supplying the auxiliary steam system from the reactor; consequently, PMS on these valves and relays had been deferred. The licensee believed a spurious signal from the limit switches or the relays caused valve OAS099A to go shut. The licensee was preparing to restore this equipment to a functional status, to be able to utilize nuclear steam. Based on this information, the inspectors have no further concerns; and this issue is considered closed.

(2) Mobile Cranes Affecting Offsite Power

Due to several industry events involving mobile cranes coming into contact with overhead power lines, the inspectors reviewed the licensee's program to prevent this type of problem. The

licensee sent a letter to the International Union of Operating Engineers-Local 965, and Stone and Webster Engineering Corp. stressing the need to assure that actions are taken while using cranes to prevent their coming into contact with overhead power lines. This issue was also addressed in the CPS quarterly operating experience newsletter. The training department included these events in crane operator training. The inspectors also toured the owner controlled area (OCA) to look for problems with the location of power lines and routes normally travelled by cranes. The inspectors have no further concerns in this area.

(3) New Fuel Receipt and Inspection

The inspectors observed the new fuel receipt and inspection activities in preparation for RF-3. Transportation documents for two fuel shipments were reviewed. Coordination among the various disciplines and radiological and personnel safety precautions taken during fuel handling were observed. The inspectors did not identify any problems with the effort and have no concerns in this area.

No violations or deviations were identified.

4. Maintenance and Surveillance (61726 & 62703)

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.

<u>Document</u>	<u>Activity</u>
D10486	Install Mod CF031 on 1E31N086B
PTERHM004	Inspect RHR Pump "C" Seal Water Cooler
9381.01	Verification of MOV Thermal Overload Bypass
D15924	Repair of 1B21F065B Motor Operator
9053.03	ECCS Actuation, Div II
9080.03	Div II DG LOP Actuation
9080.07	Div II DG LOP + LOCA Actuation
PEMAPM986	Inspect 125 VDC Molded Case Breakers
D23561	Detension Reactor Vessel (RV) Head
D23563	Remove RV Steam Dryer
D23563	Remove RV Steam Separator
PMMDGA055	Replace Cylinder Head Grommets on 1DG01KB

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.

No violations or deviations were identified.

5. Security (71707)

Lost Vital Area Key

At 5:40 p.m. on March 13, 1992, an operator noticed that he had lost a key ring, which contained a vital area key; and he immediately notified the shift supervisor. Security was notified, a security alert was declared, and a search for the key ring was initiated. At 5:55 p.m. the operator found the key ring at the radiation protection (RP) drywell control point which was in a vital area. The investigation determined that the operator had left his keys at the drywell control point at 1:30 p.m. The RP technician stated that the keys had been under his observation since that time. The licensee notified the NRC of the incident within the one hour time limit required by 10 CFR 73.71(b)(1). This event will be reviewed further by regional specialist inspectors.

No violations or deviations were identified.

6. Engineering And Technical Support (71707)

a. Cable Separation Inside Electrical Power Panels

The inspectors identified two safety-related electrical panels in which the separation between Division I and II cables appeared to be less than six inches. Clinton design specification K-2999 and industry standard IEEE 384, Paragraph 6.6.2, required that at least six inches of air separate electrical cables between different safety-related divisions or nonsafety-related divisions.

The licensee initiated a condition report (1-92-02-028) and developed an inspection plan. The plan was discussed with the inspectors. Based on searches of computer records, 195 electrical panels were initially identified as having more than one safety division or safety and nonsafety divisions inside of them. Further review narrowed the number of suspect panels to 26. The inspections of these panels was ongoing at the end of the report period and the inspectors will review the licensee's actions in a subsequent report. This issue will be tracked as an Unresolved Item (461/92002-01(DRP)).

b. Asiatic Clams Found in Screenhouse

On March 12, 1992, the licensee identified the presence of asiatic clams (*Corbicula sp.*) in the plant service water and circulating water intake bays of the circulating water screenhouse. The concentration of clams observed was greater than 1000 per ft². The size of the clams was from 12 to 17 millimeters; and they were estimated to be less than 1 year old. The licensee believed that the clams were in a juvenile stage and had not begun reproducing. This was the first significant infestation of *Corbicula* at Clinton station. The licensee initiated a condition report (1-92-03-024) and was developing a corrective action plan, at the end of the report period. Further inspections of licensee efforts will be included in the NRC review of the raw water treatment program (see also paragraph 2.e).

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

7. Safety Assessment/Quality Verification

a. Licensee Self-Assessment Capability (40500)

The inspector attended a meeting of the Nuclear Review and Audit Group (NRAG) [offsite review committee] on February 21, 1992. The inspector reviewed the NRAG's charter and the qualifications and expertise of the NRAG members. The outside members of the NRAG were highly experienced and some also served as members of other licensee's offsite review committees. The inspector verified that NRAG open items were tracked and periodically reviewed. Responsibility for resolving NRAG open items was clearly delineated and the cognizant licensee director or manager was assigned responsibility.

The use of subcommittees appeared to be very effective in ensuring that all areas of plant performance were reviewed by the NRAG. During the meeting, the inspector

observed the NRAG probe station management's awareness of two industry events, dealing with re-criticality events during plant shutdown and cooldown. Management described its understanding of these events and what specific training had been provided to the operators to address this issue. The NRAG meets at the Clinton site every other month which is more frequently than required by technical specifications.

The inspector concluded that the NRAG remained an independent and highly effective oversight function, whose focus was on the safe operation of the facility. The NRAG kept a high degree of independence and was not dominated by licensee management.

b. Review of 10 CFR Part 21 Activities (36600)

Two administrative weaknesses were previously identified in the licensee's 10 CFR Part 21 reporting program (see inspection report 461/91023). This program, implemented by Licensing and Safety Department (L&S) procedure L.4, "Evaluation and Reporting of 10 CFR Part 21 Defects and Noncompliance," was revised and issued on January 30, 1992. The inspectors reviewed the revised procedure and verified that it addressed the weaknesses. Additionally, the inspectors verified that changes to 10 CFR Part 21, which were promulgated on October 29, 1991, had also been incorporated in the revision of procedure L.4. The inspector had no additional concerns at this time; and this issue is considered closed.

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

A review of the licensee's planned activities for RF-3 was conducted using guidance contained in Temporary Instruction 2515/113, "Reliable Decay Heat Removal During Outages." The inspectors reviewed the RF-3 schedule to determine what actions or considerations were taken by the licensee to ensure that a reliable decay heat removal capability was maintained during the outage.

The licensee developed the RF-3 schedule using Clinton Power Station (CPS) Administrative Procedure 1151.04, Revision 0, "Planned Outage Scheduling." The procedure had guidelines regarding the minimum number of electrical power sources and emergency core cooling injection sources desired during plant operational conditions 4 (cold shutdown) and 5 (refueling). The

guidelines were developed in response to several industry events.³

Using these guidelines, the licensee would meet or exceeded all technical specification (TS) requirements for operable AC power sources and emergency core cooling systems (ECCS) during RF-3. The licensee intended to utilize the guidelines to the maximum extent possible during the entire refueling outage. The licensee also intended to utilize systems that were available, versus those that fully met the TS definition of operable, to meet the guidelines. For example, if only minor control room lineup changes were required to make the system inject into the reactor vessel, it was considered available.

During the development of the RF-3 schedule, licensed operators, the Independent Safety Engineering Group (ISEG), the Quality Assurance department, and other personnel reviewed the outage schedule to identify any potential challenges to decay heat removal and assess overall shutdown risk. When this review identified a two day window, where the guidelines would not be met, the licensee revised the outage schedule and extended the duration of RF-3.

Daily reviews of upcoming activities on the RF-3 schedule will be performed by an outage coordinator with a senior reactor operator's license and operations department managers prior to authorizing the release of work activities. Daily outage control center meetings, control room pre-shift briefings, and the work control briefings will identify the operable shutdown cooling system(s), the AC power sources, and the ECCS train(s) available to meet CPS No. 1151.04. Alternate decay heat removal methods will also be discussed.

Listed below are examples of the licensee's practices for maintaining reliable decay heat removal and minimizing the overall shutdown risk during RF-3:

- When periods were identified where two trains of shutdown cooling were not available, alternate decay heat removal was available through ECCS injection or other means.
- Evolutions which had the potential to drain the reactor vessel were identified. For example, snubber removal and pipe hanger inspection on systems or piping that penetrated the reactor vessel

³NUREG-1410, Loss of Vital AC Power and the Residual Heat Removal System During Mid-loop Operations at Vogtle Unit 1 on March 20, 1990

below the top of the active fuel. These activities were scheduled when secondary containment integrity was intact, when fuel movements were not in progress, and when fuel was not being stored in the upper containment pool.

- When the Emergency Reserve Auxiliary Transformer was scheduled for maintenance, both Division I and II emergency diesel generators (EDGs) would be available.
- During the Division I (Div I) battery replacement, the Div I DC electrical bus would be powered from its normal DC battery charger. A cross-tie would be available from a nonsafety-related DC power supply to power the Div I DC safety bus, if the Div I battery charger is lost. No credit was taken for the Div I EDG or ECCS systems being available during the battery replacement.
- All activities in the switchyard would be authorized through the main control room. The shift supervisor's permission would be required to enter the switchyard and begin maintenance activities.
- A plant manager standing order (PMSO-071) was written as an aid to assist the operators in re-establishing secondary containment boundaries during the outage. It required all hoses and cords that penetrated secondary containment boundaries to have quick disconnects and an identification tag with the responsible person, use, and placement date on it.

Based on this review, the inspectors concluded that the licensee implemented the guidelines contained in CPS Administrative Procedure 1151.04. Evidence of a conservative operating philosophy was observed in both the development and implementation of the guidelines. The inspectors will observe the licensee's implementation of the guidelines during RF-3 and will document their observations in a subsequent report.

No violations or deviations were identified.

8. Management Meetings

On February 18, 1992, Mr. J. S. Perry, Vice President and members of his staff met at Clinton Station with Mr. C. J. Paperiello, Deputy Regional Administrator and members of his staff to discuss the licensee's 1991 performance, 1992 strategic plan, and plans for RF-3.

9. Management Changes

On March 9, 1992, Dr. D. W. Miller, Director - Plant Radiation Protection was reassigned as the Illinois Power's chief, radiological scientist. Mr. L. E. Everman, former assistant Director - Plant Radiation Protection was promoted to acting Director. These actions were reviewed by regional specialist inspectors.

10. Unresolved item

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 6.a.

11. Exit Interview

The inspectors met with the licensee representatives denoted in paragraph 1 at the conclusion of the inspection on March 16, 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.