

NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-373/91005(DRP); 50-374/91004(DRP)

Dockets No. 50-373; 50-374

Licenses No. NPF-11; NPF-18

Licensee: Commonwealth Edison Company
Opus West III
1400 Opus Place
Downers Grove, IL 60515

Facility Name: LaSalle County Station, Units 1 and 2

Inspection At: LaSalle Site, Marseilles, Illinois

Inspection Conducted: February 26 through April 16, 1991

Inspectors: T. Tongue
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Approved By:

B. L. Burgess, Chief
Reactor Projects Section 1B

Date

Inspection Summary

Inspection from February 26 through April 16, 1991 (Reports No. 50-373/91005 (DRP); 50-374/91004(DRP)).

Areas Inspected: Routine, unannounced safety inspection by the resident inspectors of licensee action on previously identified items; licensee event reports; regional requests; operational safety; monthly maintenance; monthly surveillance; training effectiveness; report review; events; OSHA; refueling activities; and meetings and other activities.

Results: Of the twelve areas inspected, no violations were identified in ten areas. In the remaining areas, two violations were identified, one regarding adequacy and use of procedures with multiple examples. This concern will continue to be monitored by the Resident and Region Staff. The other violation was issued for an excessive delay in correcting a fire protection issue.

Operations

Overall, the licensee's performance remains good. However, this period there were examples of procedural problems. The first was the failure to properly

use a procedure while swapping power sources to the "A" reactor protection system bus on Unit 1. The second was an inadequate procedure which resulted in the spill of approximately 100 gallons of suppression pool water onto the floor of the Unit 1 raceway through the "B" loop residual heat removal suction vents. Finally, there was a notable decline in turnover quality of the Nuclear Station Operators on Unit 2.

Maintenance/Surveillance

This area continues to do well with few exceptions considering the Unit 1 outage in progress. The only example of poor performance resulted from an inadequate work procedure which resulted in a break of Unit 2 primary containment for a period of less than 1 hour.

Radiological Controls

There were three radiological uptakes this period. There was also an overflow from the ultrasonic resin cleaning sludge tank which was caused by the inattention of a radiological waste operator. Two other spills of radioactive water occurred in the reactor building and turbine building. The causes were related to operating and engineering. The licensee's performance in this period is considered to have declined.

Emergency Preparedness

No assessment was made during this inspection.

Security

No assessment was made during this inspection.

Safety Assessment and Quality Verification

No assessment was made during this inspection.

Engineering and Technical Support

Several discussions were held this period with the corporate onsite engineering staff discussing the washers missing from the bolts on the Unit 1 safety relief valve downstream tailpipe. The analysis and corrective actions appeared to be adequate. The broken rotameter in the control rod drive flushing system, which spilled cycle condensate water in the Unit 1 reactor building, appeared to be due to a miscalculation in the required margin of safety. The licensee's performance in this area is considered average for this inspection period.

DETAILS

1. Persons Contacted

- *G. J. Diederich, Manager, LaSalle Station
- *W. R. Huntington, Technical Superintendent
- *C. W. Schroeder, Production Superintendent
- D. S. Berkman, Assistant Superintendent, Work Planning
- J. V. Schmeltz, Assistant Superintendent, Operations
- *J. Walkington, Services Director
- *J. Lockwood, Regulatory Assurance Supervisor
- *M. Santic, Assistant Superintendent, Maintenance
- *W. Betourne, Quality Assurance Supervisor
- *J. Atchley, Administrative Operating Engineer
- *J. Giesecker, Technical Staff Supervisor
- *M. Musser, Engineering and Construction Department
- *B. Wood, Nuclear Safety Administrator
- *P. Piet, Nuclear Licensing Administrator
- *R. Moravec, Project Manager, Engineering and Construction Department

*Denotes those attending the exit interview conducted on April 16, 1991, and at other times throughout the inspection period.

The inspectors also talked with and interviewed several other licensee employees, including members of the technical and engineering staffs, reactor and auxiliary operators, shift engineers and foremen, and electrical, mechanical and instrument maintenance personnel, and contract security personnel.

2. Licensee Action on Previously Identified Items (92702)

(Closed) Violation (373/86004-01; 374/86004-01(DRS)): Failure to install fire detection and alarm systems in accordance with their approved fire protection programs. Based on the licensee's letter dated March 30, 1990, NRC staff concluded that local fire alarm circuits at LaSalle are not required to have electrical supervision. Should future surveillances discover problems with these circuits, however, the issue should be reevaluated. The licensee committed to track spurious siren activations over the next five years to determine if the number of occurrences is significant and warrants any further action (i.e. design, device, or component changes). The licensee has initiated action to review all work requests on fire sirens for spurious actuations and to generate an annual report (licensee action item number 377-100-86-00401.3). The station generated the first annual report on February 19, 1991. This item is closed.

(Closed) Open Item (373/87006-02; 374/87006-03): Modification of the standby liquid control system to meet the requirements of 10 CFR 50.62. The licensee submitted its plan to utilize enriched boron to the NRC in a letter dated May 24, 1988. LaSalle had procedures in place to utilize the enriched boron. This item is closed.

(Closed) Unresolved Item (374/88014-01): (Note: Due to a typographical error, this item was erroneously identified as 374/88015-01 in Inspection Report 373/88015; 374/88014). This item involved requirements to provide updated emergency notification system (ENS) reports of the results of ensuing evaluations made after the initial report required by 10 CFR 50.72 (c). This issue was identified during followup of the reactor core oscillation event (Inspection Report 373/88008; 374/88008). Enforcement action regarding this event was issued in Inspection Report 373/88022; 374/88021 and a letter dated January 12, 1989. The licensee issued a memo to all the nuclear plant managers calling for accurate and complete ENS calls. LaSalle procedure for these notifications, LZF 1310-1, Revision 16, dated May 16, 1989, provided extensive guidance on notification requirements. This item is closed.

No violations or deviations were identified.

3. Licensee Event Reports Followup (92700)

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

- a. The following reports of nonroutine events were reviewed by the inspectors. Based on this review it was determined that the events were of minor safety significance, did not represent program deficiencies, were properly reported, and were properly compensated for. These reports are closed:

373/91001-00 Reactor Building Ventilation System Isolation Damper Closing Due to Relay Failure

In addition to the foregoing, the inspector reviewed the licensee's Deviation Reports (DVRs) generated during the inspection period. This was done in an effort to monitor the conditions related to plant or personnel performance, potential trends, etc. DVRs were also reviewed to ensure that they were generated appropriately and dispositioned in a manner consistent with the applicable procedures and the QA manual.

While reviewing Deviation Investigation Report 010191-001-00, "Valve 1V0047 Declared Operable Without Required Testing," a violation of 10 CFR 50, Appendix B, Criterion V was found. For further details, this violation is discussed in Paragraph 6.

4. Regional Request (71707)

Risk Management During Outage Activities (71707 R1)

By memo dated March 21, 1991, Region III, Division of Reactor Projects requested that the resident inspectors assess the licensee's ongoing outage and outage planning activities consistent with the outage schedule to determine if the licensee adequately plans for and consciously controls plant risk during outages.

The Inspector noted that the available line up for shutdown cooling is announced at the Plan of the Day meeting. It is also an administrative requirement at the LaSalle Station to have an available line up for injection into and draining the vessel, if necessary. Significant attention is paid to activities that may result in inadvertent draining of the vessel. The Unit 1 Nuclear Station Operator (NSO) was interviewed when the high pressure core spray system was being filled and vented and he demonstrated an excellent awareness of which valve movements could result in a draining of the vessel and, more importantly, who was responsible for authorizing the movement of those valves.

The licensee has a single individual acting as the dedicated Shift Engineer (SE) and another individual as the dedicated Shift Control Room Engineer (SCRE) on the shut down unit during the day shift for the duration of the outage. The SE will administratively hang out-of-service cards on valves that could cause an undesired draining of the reactor vessel during plant evolutions. This SE is also responsible for the control of construction evolutions and vehicle movements, outside the building in the protected area, that could potentially create problems with the electrical transmission equipment. This matter will be given additional review in the future.

No violations or deviations were identified.

5. Operational Safety Verification (71707)

During the inspection period, the inspectors verified daily, and randomly during back shift and on weekends, that the facility was being operated in conformance with the licenses and regulatory requirements and that the licensee's management control system was effectively carrying out its responsibilities for safe operation. This was done on a sampling basis through routine direct observation of activities and equipment, tours of the facility, interviews and discussions with licensee personnel, independent verification of safety system status and limiting conditions for operation action requirements (LCOs), corrective action, and review of facility records.

On a sampling basis, the inspectors daily verified proper control room staffing and access, operator behavior, and coordination of plant activities with ongoing control room operations; verified operator adherence with the latest revisions of procedures for ongoing activities; verified operation as required by Technical Specifications (TS); including compliance with LCOs, with emphasis on engineered safety features (ESF) and ESF electrical alignment and valve positions; monitored instrumentation recorder traces and duplicate channels for abnormalities; verified status of various lit annunciators for operator understanding, off-normal condition, and corrective actions being taken; examined nuclear instrumentation (NI) and other protection channels for proper operability; reviewed radiation monitors and stack monitors for abnormal conditions; verified that onsite and offsite power was available as required; observed the frequency of plant/control room visits by the station manager, superintendents, assistant superintendents, and other

managers; and observed the safety parameter display system (SPDS) for operability.

During routine observation of shift turnovers, it appeared that the quality of the NSO turnovers on the operating unit had declined due to the additional attention given to the non-operating unit. This was pointed out to the station management and the situation was quickly rectified.

During tours of accessible areas of the plant, the inspectors made note of general plant/equipment conditions, including control of activities in progress (maintenance/surveillance), observation of shift turnovers, general safety items, etc. The specific areas observed were:

a. Engineered Safety Features (ESF) Systems

Accessible portions of ESF systems and components were inspected to verify: valve position for proper flow path; proper alignment of power supply breakers or fuses (if visible) for proper actuation on an initiating signal; proper removal of power from components if required by TS or FSAR; and the operability of support systems essential to system actuation or performance through observation of instrumentation and/or proper valve alignment. The inspectors also visually inspected components for leakage, proper lubrication, cooling water supply, etc.

b. Radiation Protection Controls

The inspectors verified that workers were following health physics procedures for dosimetry, protective clothing, frisking, posting, etc., and randomly examined radiation protection instrumentation for use, operability, and calibration.

During the inspection period, on three occasions, personnel experienced uptakes of radioactive material while working on the Unit 1 outage. These were examined by a Region III Radiation Specialist and will be discussed in a separate report.

c. Security

Each week during routine activities or tours, the inspector monitored the licensee's security program to ensure that observed actions were being implemented according to their approved security plan. The inspector noted that persons within the protected area displayed proper photo-identification badges and those individuals requiring escorts were properly escorted. The inspector also verified that checked vital areas were locked and alarmed. Additionally, the inspector also verified that observed personnel and packages entering the protected area were searched by appropriate equipment or by hand.

c. Housekeeping and Plant Cleanliness

The inspectors monitored the status of housekeeping and plant cleanliness for fire protection, protection of safety-related equipment from intrusion of foreign matter and general protection of equipment from hazards.

On March 14, 1991, while touring the Unit 2 auxiliary building, oil was found dripping from the ceiling beams above the 242X 480 Volt A.C. electrical switchgear panel (non-safety related). The extent of the leakage was such that a 15 foot length of beam covered with fire retardant was soaked with oil. Oil was also dripping down on top of the electrical panel, onto nearby light fixtures, and onto the floor. A fire in this electrical bus could possibly have resulted in a trip of the unit or an unplanned transient.

The inspector also noticed that a work request ticket attached to the electrical panel identified this leakage and called for the replacement of the fire retardant on the beam overhead. The work request ticket was dated from 1987 and is still outstanding. The time period of over four years including two refueling outages since identification is sufficient to repair the oil soaked lagging. When this problem was brought to the attention of the licensee, the Unit 1 auxiliary building was inspected in the same respective area and the same problem was found to exist there to a lesser extent.

The leakage had been identified as coming from the 2A and 1A turbine driven reactor feed pumps. Licensee maintenance history showed that the oil leaks had been repaired, but the residual oil on the beam had not been removed. The Fire Protection System Engineer was consulted on the effect the oil would have on the fire retardant. The manufacturer stated that the oil would cause the retardant to behave as a wick should it catch fire. 10 CFR, Appendix B, Criterion XVI requires that conditions adverse to quality be promptly corrected.

The failure to promptly correct this potential fire hazard is considered to be a violation of 10 CFR 50, Appendix B, Criterion XVI (374/91004-01(DRP)).

In addition, during plant tours, the inspectors noted that the Underwriter Laboratory (UL) tags on fire doors had been painted over. The licensee stated that they had identified the problem and were going to change the painting procedure to state that these tags were not to be painted over. The licensee also stated that they would also clean the tags off under a blanket work request when the Technical Staff performs an upcoming door inspection.

The inspectors also monitored various records, such as tagouts, jumpers, shift logs and surveillances, daily orders, maintenance items, various chemistry and radiological sampling and analysis, third party review results, overtime records, QA and/or QC audit results and postings required per 10 CFR 19.11.

One violation was identified in this area.

6. Monthly Maintenance Observation (62703)

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

The following items were considered during this review: the limiting conditions for operation were met while components or systems were removed from service; approvals were obtained prior to initiating the work; activities were accomplished using approved procedures and were inspected as applicable; functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities were accomplished by qualified personnel; parts and materials used were properly certified; radiological controls were implemented; and fire prevention controls were implemented. Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may affect system performance.

The following maintenance activities were observed and reviewed:

Unit 1

WR L 99810	LMS-DG-01	1A Diesel Generator (D/G) Mechanical Inspection
WR L 99785	LES-DG-101	1A D/G Electrical Inspection and Applicable Repairs
WR L 00784	LES-EQ-112	EQ Inspection on HPCS Flow Bypass Valve
WR L 99817	LMS-DG-01	1B D/G Mechanical Inspection
WR L 99799		Hydrogen Recombiner Preventive Maintenance
LEP-MS-101	SRV Lift Indicating Switch Assembly Removal, Replacement and Calibration	

Unit 2

WR L 06187	2D Main Steam Line Rad Monitor
WR L 05456	Install and Remove Temporary System Change Per LLP-90-085 for Bus 141Y Outage

The inspectors monitored the licensee's work in progress and verified that it was being performed in accordance with proper procedures, and approved work packages, that applicable drawing updates were made and/or planned, and that operator training was conducted in a reasonable period of time.

On March 21, 1991, while performing preventive maintenance on the Unit 1 hydrogen recombinder, it was discovered that primary containment integrity on Unit 2 (operating at full power) had been lost to the secondary containment as a result of the way the maintenance had been performed.

Every five years the blower motor assembly on the hydrogen recombiner must be lubricated. After lubrication, the blower motor must be run for a period of ten minutes to ensure the grease was applied correctly. To observe this, the blower motor assembly cover was left off when the blower was run. The hydrogen recombiner has the capability to be lined up to either unit. Because work was being performed on the suction and discharge valves to the recombiner from the Unit 1 containment, the recombiner was aligned to the Unit 2 containment to run the blower. It was thought that the suction line was hard piped directly to the blower. In reality, the suction line runs to inside the cover of the blower motor assembly which acts as a receiver. This opened the containment of Unit 2 which was operating at 100% power, to the common secondary containment. The primary containment valves were opened at approximately 11:10 a.m. and shut at approximately 11:50 a.m. Technical Specifications require that primary containment integrity be restored within one hour or the unit must be shut down. Inspection inquiries into whether this condition existed in the past and for how long were inconclusive. This situation was not reportable per 10 CFR 50.72.

The root cause of this problem was the failure to adequately update the procedure as previously identified in other work packages. Work Package L75487 included a procedure change that required the blower cover to be installed while performing the ten minute blower run. Work Package L75487 was the previous performance of this maintenance on the Unit 2 hydrogen recombiner in 1988.

The safety significance of this event was that primary containment integrity was lost without the licensee's prior knowledge. In addition, the radiological ramifications to the workers in the area are unknown.

The corrective actions to be taken will be to change the procedure to require the the hydrogen recombiner only be lined up to the non-operating unit during future maintenance. This matter is considered a violation of 10 CFR 50, Appendix B, Criterion V (373/91005-01a(DRP)).

While performing a review of Deviation Inspection Report 010191-001-00, it was discovered that the licensee improperly prepared a work package. Technical Specification (TS) 4.8.3.3.1.b which requires a functional test of the overload bypass circuitry for valves listed on Table 3.8.3.3.1 following maintenance on the motor starter. The forward/reversing motor starter contactor for the Unit 1 drywell nitrogen make-up valve 1VQ047 was replaced on January 2, 1991. 1VQ047 is listed in TS Table 3.8.3.3.1. The contactor was to be replaced per the applicable portion of LES-EQ-115, "Klockner-Moeller Circuit Breakers and Related Motor Control Center (MCC) Equipment." Step E.3 of that procedure states, "For any repair or replacement work done on the 120 VAC control circuit of MCC cubicles that feed motor operated valves listed in TS Table 3.8.3.3.1, where a 120 VAC lead is lifted, a channel functional test of the overload bypass circuit must be performed." Step E.5 states, "The need for a channel functional overload bypass test shall be determined by the work analyst during initial preparation of the work package."

On January 2, 1991, at 11:50 p.m., 1VQ047 was energized and returned to service following scheduled EQ surveillance work and completion of the Work Request L04562 to replace the motor starter contactor. On January 3, 1991, at 7:45 a.m., the shift was notified that the required overload bypass functional test had not been performed. The valve was declared inoperable at 7:50 a.m. in accordance with TS action requirements. The valve was then closed and deactivated at 8:40 a.m. within four hours as required by TS 3.6.3. Overload bypass testing was performed satisfactorily during the afternoon shift on January 3, 1991, and returned to operable status.

The root cause of this incident was the failure of the work analyst to follow the procedure correctly and prepare the work package adequately. The safety significance of this event was small. The overload bypass test was performed satisfactorily on 1VQ047. If 1VQ047 had failed to perform its function, valve 1VQ048 which is in series would have closed to perform the primary containment isolation function.

The corrective action taken by the licensee was to counsel the electrical maintenance personnel involved and Electrical Maintenance Department personnel were trained on this matter. This matter is considered a violation of 10 CFR 50, Appendix B, Criterion V (373/91005-01b(DRP)).

During the removal, testing and reinstallation of the safety relief valves (SRV) on Unit 1, it was discovered that washers intended to be installed between the bolt head and the flange in the SRV discharge piping were not installed resulting in improper gaps between the flange faces. The licensee also determined through interviews with maintenance personnel that the washers had never been installed on any of the Unit 1 SRV bolts. On Unit 2, the washers were installed as indicated on the drawing.

The situation was noticed due to visible gaps between the bolt head and the flange when the bolts were torqued to the required value by mechanical maintenance workers.

The reason why the washers were not installed as per the drawing is unknown. The licensee conducted an investigation but the results were inconclusive. The safety significance of this discovery is considered to be small. The failure of an SRV discharge tailpipe is bounded by the plants design basis accident. To exceed this boundary would require the simultaneous failure of a significant number of SRV discharge tailpipes. The licensee performed a seismic loading analysis on the worst case valve and found it to meet Seismic Class I requirements. The valves are cycled after each refueling outage at operating pressure and there has not been any indication of leakage.

The corrective actions taken by the licensee were to perform measurements between the discharge piping and the valve flange faces to estimate the percentage of gasket crush. The manufacturer's response was that any gasket crush was sufficient to prevent leakage. The licensee chose 85% gasket crush as an acceptable level. Washers were installed on the

six valves that were removed and reinstalled. All the bolts that showed gaps were also removed and had washers installed. Any areas on valves where gasket crush was determined to be less than 85%, the bolts were removed and reinstalled with washers. Overall, out of 288 bolts, 207 were removed and were reinstalled with washers. The other 81 were considered not to be necessary for ALARA considerations in order to conserve man-rem. All the washers will eventually be installed during the next refueling outage.

No deviations were identified, however, two of six examples of a violation of 10 CFR 50, Appendix B were identified in this area.

7. Monthly Surveillance Observation (61726)

The inspectors observed surveillance testing required by Technical Specifications during the inspection period and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation were met, that removal and restoration of the affected components were accomplished, that results conformed with Technical Specifications and procedure requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

The inspectors witnessed portions of the following test activities:

Unit 1

LIS-C-401	MSIV Leakage Control Main Steam Line Pressure Functional Test
LTS-700-6	Division I Battery Discharge Test
LTS-700-4	125 Volt Division III Performance Battery Test Discharge
LIS-NR-103BA	Unit 1 Average Power Range Monitor Channels B, D, F Rod Block Scram Semi-Annual Calibration for Normal Plant Conditions

Unit 2

LIS-MS-203	Main Steam Line High Radiation Scram and MSIV Isolation Calibration
LIS-RI-412	Reactor Vessel High Water Level 8 RCIC Turbine Trip Monthly Functional Test
LRP-1820-17	Main Steam Line Process Radiation Monitor Calibration
LOS-RH-Q1	RHR (LPCI) and RHR Service Water Pump and Valve Inservice Test for Operational Condition 1,2,3,4 and 5

On March 16, 1991, while observing the performance of LIS-NR-103BA, "Unit 1 Average Power Range Monitor Channels B, D, F Rod Block and Scram Semi-Annual Calibration For Normal Plant Conditions," it was brought to the inspector's attention that a minor step, to reposition a meter scale

switch, necessary to perform the surveillance was missing from the procedure. Verbal authorization from the IM supervisor was required to complete the surveillance. This is an example of an inadequate procedure and is in violation of 10 CFR 50, Appendix B, Criterion V (373/91005-01c(DRP)).

No deviations were identified, however, one of six examples of a violation of 10 CFR 50, Appendix B was identified in this area.

8. Training Effectiveness (41400, 41701)

The effectiveness of training programs for licensed and non-licensed personnel was reviewed by the inspectors during the witnessing of the licensee's performance of routine surveillance, maintenance, and operational activities and during the review of the licensee's response to events which occurred during the inspection period. Personnel appeared to be knowledgeable of the tasks being performed, and nothing was observed which indicated any ineffectiveness of training.

On March 25, 1991, the inspectors attended the annual Nuclear General Employee Training (NGET) for recertification for access to all CECO stations. The inspectors also used the time to verify that the training was relevant to its intended purpose, that it met appropriate regulatory requirements and that the examination administered was appropriate to measure the student's knowledge. Radiation protection was not assessed as the inspectors were exempt from that portion of the training. Other subject matter covered was security, industrial safety, Quality Assurance/Control, equipment Environmental Qualifications (EQ), site specific information, and fitness for duty. The training was found to be acceptable.

No violations or deviations were identified.

9. Report Review (90713 and 92701)

During the inspection, the inspector reviewed the licensee reports and determined that the information was technically adequate, and that it satisfied the reporting requirements of the licensee, Technical Specifications and/or 10 CFR as appropriate.

The following reports were reviewed:

- ° The Monthly Performance Reports for February and March 1991, and confirmed that the information provided met the requirements of Technical Specification 6.6.A.5 and Regulatory Guide 1.16.
- ° LaSalle County Station Monthly Plant Status Report for January and February 1991
- ° Weekly Pro-Active Management Reports

- ° LaSalle Radwaste Error Free Operations Committee Report of February 22 and March 18, 1991
- ° Control Room Work Request Reports
- ° Event Frequency Reduction Committee Notes
- ° Monthly Work Request Reports
- ° Semi-Annual Radioactive Effluent Report for July through December 1990
- ° Annual Report for LaSalle County Station for January through December 1990
- ° The Fitness for Duty Report dated February 26, 1991

No violations or deviations were identified.

10. Events (93702)

Unit 1 Fuel Loading Bridge Solenoid Failure

On February 27, 1991, during fuel unloading activities on Unit 1, an apparent fire involving smoke and electrical sparks occurred in a solenoid assembly associated with one of the fuel grapple brake systems. At the time, there was no fuel bundle suspended from the grapple. After smoke was observed the fuel handling supervisor ordered the bridge operator to move the refuel bridge away from over the reactor vessel and core. At no time were actual flames observed from the failed solenoid.

The fuel handling bridge operator raised the fuel grapple until he received the "full up" light on the console. The bridge operator moved the refuel bridge northward away from the reactor core and toward the fuel pool. During this movement, the fuel grapple hit the front of the cattle chute above the northern most point of the reactor vessel. The fuel handling supervisor did not notice that this was going to occur because of his efforts at the time to extinguish the fire. The fuel handling supervisor verified with the bridge operator that secondary fuel grapple brake would fail safe then ordered the fuel handling bridge deenergized.

After extinguishing the fire, the refuel bridge fuel grapple was later raised manually and the Unit 1 bridge was moved over the dryer/separator pit to make repairs to the bent mast. Unit 1 defueling operations resumed on February 28, 1991, using the Unit 2 refuel bridge.

Preliminary investigation into why the grapple hit the cattle chute suggests that contactors in the grapple raise/lower switch were sticking or chattering in a position other than neutral. The faulty contactors resulted in the control circuit not remaining in the "off"

state. This resulted in the brakes not setting after the normal up limit indication was received. The root causes of the contactor failure and the fire have not yet been determined.

There was minimal safety significance to this event because the grapple was not loaded with fuel. However, the consequences could have been more serious had a fuel bundle been loaded on the grapple.

The corrective actions for this event to be taken are:

- a. The need for additional training on actions to take for a fire on the refueling bridge will be evaluated.
- b. Engineering will evaluate if an alternate replacement solenoid or one with higher reliability is available.
- c. Engineering will evaluate an alternate replacement for the grapple raise/lower switches.

Condenser Circulating Water Spill

On March 6, 1991, while chemically cleaning (descaling) the circulating water side of the Unit 1 main condenser, there was excessive spewing and release of cleaning solution and carbon dioxide to the condenser pit and heater bay area. Line blockage from two temporary vent tanks led to blowing off a hose upstream of a HEPA filter. As a precaution, the lower turbine building (Units 1 and 2) and the Unit 1 condenser pit and heater bay area were evacuated of unnecessary personnel until sufficient oxygen concentration could be verified. The licensee made a courtesy ENS phone notification. There was no safety significance to this event because the oxygen levels never became unacceptable.

Radioactive Liquid Spills

Several spills of radioactive liquid were experienced during the inspection period. On February 22, 1991, about 1,000 gallons of cycle condensate were released from an overflowing Turbine Building floor sump while draining feed water heaters.

On March 7, 1991, a glass rotameter in a Temporary System Change, designed to provide flow to the Unit 1 control rod drives, burst and spilled 3,100 gallons of cycle condensate in the Unit 1 reactor building. The deenergizing of an electrical bus for preventive maintenance caused a solenoid flow control valve in the temporary system to close 80%. The flow control valve closure caused the pressure in the temporary system to spike which caused the rotameter to break. Both the Temporary System Change that installed the rotameter and the evolution to secure power were administratively controlled in accordance with the licensee's procedures. The design system pressure rating of the rotameter was marginal but exceeded expected system pressure.

A third release occurred when the radwaste ultrasonic resin cleaning sludge tank overflowed and subsequently caused a turbine building sump to overflow. This was a personnel error.

In all three cases, the licensee took appropriate corrective actions varying from equipment modifications to disciplinary action. In each case, the cleanup was promptly completed.

Unusual Event Due To Ice Storm

On March 12, 1991, an Unusual Event (UE) was declared at 2:50 p.m. when a blizzard/ice storm disabled the wind speed direction instrumentation onsite. This affected the assessment capability of evaluating a radiological release should it have occurred. In addition, the Unit 1 offsite transmission line to the Braidwood Station was taken out by the storm. The UE was secured at 1:10 p.m. when alternate information sources were provided by a meteorological contractor. The storm caused some problems with travel to and from the site. The inspectors verified that sufficient operators and key personnel were available and that Technical Specification overtime requirements were met.

Primary Containment Isolation System (PCIS) Group IV Isolation During Surveillance

On March 18, 1991, Instrument Maintenance (IM) Technicians were performing LIS-VR-102, "Fuel Pool Exhaust Radiation Monitor Functional Test." During the performance of this surveillance, a full Division I PCIS Group IV isolation occurred. All plant equipment functioned as expected after the isolation occurred. The event was reported within four hours as required.

The root cause of the event is unknown. An investigation is in progress. The surveillance should not have caused the isolation if performed properly and currently there is no indication that it was not.

There is minimal safety significance to this event. The concern is the ability of the ESF system involved to self start during the performance of a surveillance. Corrective actions will be determined when the cause of the event is discovered.

Engineered Safety Feature (ESF) Actuation During Relay Calibrations

On March 19, 1991, while performing Unit I division 3 diesel generator 1B (DGLB) protective relay calibrations normal feed breaker ACB 1432 tripped open and Division 3 bus 143 was deenergized. This resulted in an ESF auto-start signal for the DGLB. Diesel generator 1B did not start because the DG was inoperable for planned maintenance. This event was reported within 4 hours as required. The root cause of this event was an inadequate procedure and the failure of those involved to recognize the result of tripping an over current relay. The procedure does not specify

which trips needed to be defeated to perform this surveillance. This is another example of an inadequate procedure in that it had insufficient detail and relied upon test personnel review and is in violation of 10 CFR 50, Appendix B, Criterion V (37C/91005-01d(DRP)).

There was minimal safety significance involved in this event in that the DGLB was inoperable and all the equipment powered from bus 143 was inoperable due to the refueling outage. All other plant equipment functioned as designed.

PCIS Group IV Isolation During Removal of Temporary System Change (TSC)

On March 26, 1991, while TSC 1-473-91 was being cleared, continuity was lost in the reactor building ventilation/fuel pool cooling radiation monitor group IV primary containment isolation trip logic. This resulted in a Unit 1 PCIS Group IV isolation. Proper notification was made within four hours as required.

The root cause of this event was personnel error. The Shift Engineer and the Instrument Maintenance (IM) Foreman discussed what was necessary to clear this TSC. Two jumpers were required in the circuit to prevent the group IV isolation. One jumper had already been removed and was so properly documented on the TSC. The fact that the jumper was already removed was not noticed by the IM Foreman, the Shift Engineer, the Shift Control Room Engineer, the NSO, or the EO, all of who had the opportunity to identify the error. Contributing to this event was the documentation of the TSC. Temporary alligator clips are listed in small print on the bottom of one page of the attachment to the procedure while other jumpers are listed on another page.

The safety significance of this event was small. The PCIS systems all operated as expected. The concern was the ability of this mistake to elude detection through so many layers of review. The final evaluation of this event and the corrective action will be conducted when the LER is reviewed.

PCIS Group IV Isolation During Reactor Protection System (RPS) Bus Transfer

On March 28, 1991, while transferring the power to the Unit 1 RPS A bus from its normal to alternate supply in accordance with procedure LOP-RP-03, a Unit 2 Group IV isolation occurred. The procedure called for the Unit 2 isolation signal to be jumpered out of the Unit 1 logic circuit. The Unit 1 isolation signal was jumpered out from the Unit 1 logic circuit incorrectly. Proper notification was made within four hours as required.

The root cause of this event was a personnel error. The procedure is clear as to what signals must be isolated. The procedure was premarked to ensure proper compliance. The extra Nuclear Station Operator (NSO) was dedicated to control of this evolution. The NSO made a transcription error while copying down the instructions for the Equipment Operators (EO)

to place the required jumpers instead of giving the procedure to the EOs. There were no other steps to be performed by the NSO until the EOs completed installation of the jumper. When questioned, the NSO had no explanation as to why he did not give the EOs the procedure.

The safety significance of the event itself was small. The Unit 2 isolation signal was jumpered out from the Unit 1 logic for approximately 15 minutes. All Unit 2 isolation signals from Unit 2 were intact. The safety significance comes from the continued trend of ESF actuations due to failing to follow procedures. This is considered a violation of 10 CFR 50, Appendix B, Criterion V (373/91005-01e(DRP)).

The following corrective actions have been or will be taken:

- a. A checklist will be developed for obtaining information from personnel involved in an event.
- b. The individuals involved were reprimanded with a letter in their personnel file.
- c. The event was tailgated to all crews by the individuals involved.

PCIS Group II Isolation During Maintenance On Trip Logic Circuit

On April 1, 1991, while installing electric connectors for sensing points (banana jacks) at points in the Division II PCIS isolation logic on Unit 1 in accordance with work request L94823 a partial PCIS Group II isolation occurred. Proper notification was made within four hours as required.

The root cause of the isolation is unknown. A fuse in the logic circuit blew causing the isolation. The cause of the blown fuse is unknown. It is suspected that a short occurred during the installation of the banana jacks in the circuit.

The safety significance of this event was small. The Unit is defueled. All systems responded as expected. Further evaluation will be conducted when the LER is received.

Spill of Suppression Pool Water From Residual Heat Removal (RHR) System

On April 5, 1991, approximately 100 gallons of contaminated water spilled onto the floor of the Unit 1 raceway. The water came from the Unit 1 suppression pool through the B RHR system suction line vent valves. The water was found coming out of the valves by an EO in the area who called the control room and stopped the evolution. The spill occurred during the return to service of the B RHR loop which had been drained. This event was not reportable.

This spill was thought to be caused by an inadequate procedure LOP-RH-03, "Draining the Residual Heat Removal System," which gave instructions to open the valves but no instructions to close the valves. However, subsequent investigation could not identify the individuals who had reopened the vent valves after they were shut for lifting the out-of-service. Apparently, the vent valves were reopened by persons unknown after the system was prepared for refilling.

The safety significance of this event is small due to the small amount of water spilled and the fact the water was from the suppression pool. The concern is the changing of system configuration without use of an authorizing procedure. This is considered another example of a violation of 10 CFR 50, Appendix B, Criteria V (373/91005-01F(DRP)).

The corrective action for this event will be to rewrite the procedure adding a step to close the vent valves upon completion of the evolution.

No deviations were identified, however, three of six examples of a violation of 10 CFR 50, Appendix B were identified in this area.

11. OSHA (93001)

On March 21, 1991, while performing a normal inspection tour of the station security fence, the inspector discovered that cables from a 480 Volt AC switch to several transformers were submerged under approximately six inches of water that had pooled from a recent rain. The 480 V AC switch and transformers were supplying power to several trailers designed to be used for contractors. The switch and the transformers were raised to prevent water intrusion. The inspectors informed plant management of the existing condition. Corrective actions were taken to pump out the water and fill in the low spots to prevent the water from pooling there again. A subsequent inspection after another significant rain indicated that the actions taken were effective.

12. Refueling Activities (60710)

Throughout the inspection period, Unit 1 was shut down for its fourth refueling (L1R04) outage. During the period, the inspectors monitored various maintenance and surveillance tests described previously in this report. Additionally, the inspectors verified that the refueling activities were being conducted and controlled as required by Technical Specifications and approved procedures. This was done on a sampling basis through monitoring planning sessions, through direct observation of activities and equipment, tours of the facility, interviews and discussions with licensee personnel, and independent verification of safety system status and limiting conditions for operation (LCO) action requirements.

No violations or deviations were identified in this area.

13. Meetings and Other Activities (30711)

Site Visits by NRC Staff

On March 27, 1991, NRC Chairman Carr was onsite accompanied by his Technical Assistant, L. Norholm, and C. J. Paperiello, Deputy Regional Administrator of Region III. During the visit, Commissioner Carr met with the resident inspectors and went on a plant tour with the station manager and senior corporate officials. Following the tour, the licensee made presentations on the past, present, and future status of the station, maintenance issues, engineering and technical support, and self assessments. The Chairman provided comments on his observations in the plant, on the information provided by the licensee, and on other timely and appropriate topics. He closed with a question and answer exchange period with the personnel present. He also expressed appreciation to all who participated in the preparation for his visit.

14. Exit Interview (30703)

The inspectors met with licensee representatives (denoted in Paragraph 1) during the inspection period and at the conclusion of the inspection period on April 16, 1991. The inspectors summarized the scope and results of the inspection and discussed the likely content of this inspection report. The licensee acknowledged the information and did not indicate that any of the information disclosed during the inspection could be considered proprietary in nature.