U. S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 85-02 / 85-01

Docket No. 50-352 / 50-353

License No. NPF-27 / CPPR-107 Priority - Category C / A

Licensee: Philadelphia Electric Company

2301 Market Street

Philadelphia, Pennsylvania 19101

Facility Name: Limerick Generating Station, Unit 1 & 2

Inspection at: Limerick, Pa.

Inspection Conducted: January 1 - 31, 1985

Inspectors: J. F. Wiggins, Senior Resident Inspector — 2-7-85 Date

R. W. Borchardt, Reactor Engineer — 2-6-85 Date

J. E. Beall, Project Engineer — 2/14/85 Date

Approved by: R. M. Gallo, Chief, Reactor Projects Section 2A — 2/14/85 Date

Inspection Summary: Combined Inspection Report for Inspection Conducted January 1 - 31, 1985 (Report Nos. 50-352/85-02, 50-353/85-01)

Areas Inspected: Routine and backshift inspections by the resident inspector and region-based inspectors of: followup on outstanding inspection items; general walk-through inspections; review of special and routine reports; allegation followup; review of events occurring during the inspection; and surveillance and maintenance activities. This inspection involved 77 hours for Unit 1 by the resident inspector, 136 hours for Unit 1 and 2 hours for Unit 2 by the region-based inspectors.

Result: Two violations were identified. These violations indicate that increased management attention is required to improve the control and cognizance of the operability status of Technical Specification-related equipment.

DETAILS

1. Persons Contacted

Philadelphia Electric Company (PECo)

J. M. Corcoran, Field QA Branch Head
J. Doering, Operations Engineer
P. Duca, Technical Engineer
J. Franz, Assistant Station Superintendent
G. Leitch, Station Superintendent

General Electric (GE)

A. Jenkins, Operations Manager

Also, during this inspection period, the inspectors discussed plant status and operational readiness with other supervisors and engineers in the PECo, Bechtel and GE organizations.

2. Followup on Outstanding Inspection Items

2.1 Inspector Follow Items

(Closed) Follow Item 50-352/84-65-03: Review of licensee corrective actions regarding an inadvertent ECCS actuation and diesel generator startup on 11/14/84.

The inspector reviewed the licensee's corrective actions provided in Licensee Event Report No. 84-007. This corrective action included counseling of the I and C technician involved and a request for a modification to add head chambers on instrument racks to assist in backfilling the instruments on the racks after maintenance. This modification will be followed by the resident inspectors.

3. Plant Tour

3.1 Unit 1

Periodically during the inspection period, the inspectors toured the Unit 1 containment, the reactor enclosure, the control enclosure, the turbine enclosure, the diesel generator enclosures, the rad-waste enclosure, the off-gas enclosure, and the site perimeter outside the power block. The inspectors examined preventive and corrective maintenance, surveillance testing, tagging of equipment, housekeeping, radiological control practices, portal monitoring,

security, lighting, vehicular control, power block control points, security fencing, fire protection equipment, environmental controls, and general plant operations. The inspectors routinely toured the control room to verify proper control room manning, procedural compliance, safety system availability, and nuclear instrumentation operability. Operating logs, the jumper-bypass log, the temporary circuit alteration (TCA) log, operating orders and plant trouble reports were reviewed to verify that all technical specification requirements were met. Interviews and discussions were routinely conducted with licensee operators and staff concerning the status of off-normal alarms, compliance with technical specifications and general plant conditions.

Valve lineup verification checks were performed on the Reactor Core Isolation Cooling System, Control Room Emergency Fresh Air Supply System, 1B Diesel Generator, and the High Pressure Coolant Injection System. In addition, the inspector reviewed TCAs 186, 187, 188, 189 and 196 to verify their acceptability.

Except for the items discussed below, no problems were identified.

3.1.1 Review of Logs and Records

During daily tours of the control room, the inspector identified several concerns relating to the quality of operating logs. While the three instances discussed here did not result in a significant safety concern, they do indicate that these operator logs are not always receiving adequate attention by the control room operators. In addition, it was noted that the review conducted by shift supervision did not identify any of these discrepancies.

- During a routine tour of the control room on 1/11/85 the inspector noticed that the drywell air temperature indicator on panel 10C601 was close to exceeding the technical specification (TS) limit of 135^{o}F. Upon further investigation, the inspector found that the Daily Surveillance Log for 1/10/85 indicated that the average drywell temperature determined during the midnight to 8:00 a.m. shift on 1/11/85 was 137^{o}F. The licensed operator who had performed this calculation had not made the appropriate annotations on the daily log for an out of specification reading, nor had shift supervision initiated corrective actions. In addition, the inspector noted that some of the data points used to calculate the average temperature were process computer points which were known to be invalid.

The inspector notified shift supervision of his concern. The average drywell temperature was then recalculated without using the invalid computer points. In addition, a current average drywell temperature was also calculated. The results of both calculations were less than the 135°F TS limit.

- On 1/11/85 the inspector reviewed the completed surveillance test (ST) procedures performed on 1/10/85 to support the restart of the A and B reactor recirculation pumps after they had tripped in response to a loss of the B reactor protection system power supply. The inspector noted that all values recorded in the ST met their associated acceptance criteria, but that the values had been documented in pencil instead of pen. The STs were also reviewed and approved by the shift supervisor.

- On 1/23/85, during a control room tour, the inspector reviewed selected surveillance test (ST) results which had been previously reviewed and approved by the shift supervisor. The inspector noted some discrepancies in the procedure for ST-6-107-590-1, the Daily Surveillance Log for Operational Conditions 1, 2 and 3 for 1/22/85. The discrepancies included instances of write-over corrections made to the data in the procedure. In addition, there were three instances wherein the data did not meet the ST's acceptance criteria. For these instances, the discrepant data were circled in red as required, but the cover sheet to the ST was not annotated by the shift supervisor to indicate that steps in the ST were completed unsatisfactorily, and that adequate compensatory measures had been taken.

  Regarding the instances in which the ST data did not meet acceptance criteria, the inspector observed that either other records, such as the Shift Supervisor's Limiting Conditions for Operation Tracking Log, showed the inoperable status of systems involved or that the discrepant data were not indicative of violations of Technical Specifications.

The inspector discussed the problems described above with the Operations Engineer and the Station Superintendent. The inspector was informed of a planned program for overall improvement of the quality of operations logs and records. Further, the inspector was informed of the licensee's plans to staff an additional supervisory level person on each shift to decrease the administrative burden on the shift supervisor. The inspector informed the licensee that its program for general improvement in logs and records maintained by operations personnel would be reviewed in a future inspection. (50-352/85-02-01)

3.1.2 Loose Parts Monitoring System Status:

On January 24, 1985, the inspector noted that all high and low level alarm features associated with the reactor coolant system (RCS) loose parts monitoring system had been defeated. The inspector was informed by the shift supervisor that maintenance request form (MRF) 8501192 had been approved for implementation on 1/23/85 to authorize adjustments to the high and low signal filters in the loose parts monitor modules. Apparently, during the course of the work performed on 1/23/85, the technicians involved placed the alarm switches in the defeat position. However, shift supervision was not informed as indicated by the lack of entries to this effect in either the shift supervisor's log or the LCO Tracking log.

The inspector informed the shift supervisor that by placing the alarm switches in the defeat position, the monitoring system had been rendered inoperable because it was incapable of providing annunciation and alarms in the main control room in response to indications of loose parts in the RCS. Thus the LPMS was removed from service in conflict with the requirements of Technical Specification (TS) 3.3.7.10, without the knowledge and control of shift supervision as required by Administrative Procedures A-7 and A-41. The inspector informed station management that the uncontrolled removal of TS-related equipment from service was a violation of TS 6.8.1. (50-352/85-02-02)

The problem encountered with control of TS-related parameters and equipment described above was similar to other issues identified by the inspectors during this inspection period including the two described below:

(1) On 1/8/85: drywell pressure was indicated to be slightly less than 0 psig and the problem had not been identified and appropriate corrective action had not been taken until the inspector questioned the indication.

(2) On 1/16/85: the B train of the Reactor Enclosure Recirculation system was removed from service by placing it in the cooldown mode without identifying that the B train was inoperable while in that mode.

The corrective actions to the violation will be reviewed to assure the actions are also responsive to the two additional items described above.

3.1.3 Control Room Pressure Control

On 1/24/85, at about 10:00 a.m., the inspector noted that the control room was not being maintained at a positive pressure with respect to the turbine building. The inspector observed the control room differential pressure, as indicated on panel 00C681, and found that the indicator was on its lower peg (i.e., less than 0.1 in water vacuum) except during those times when either the east or west control room doors were open.

The inspector discussed this condition with the shift supervisor and shift superintendent. The inspector learned that, at about 9:30 a.m., 1/24/85, the control room normal supply and exhaust dampers had been tagged closed and the control room HVAC system placed in its recirculation mode to support work on dampers HV-78-021A and HV-78-021B which was being controlled by maintenance request forms (MRF) 8404428 and 8404429. However, the control room toilet exhaust fan and damper had not been closed. This resulted in a loss of positive pressure control in the control room and a rapid depressurization in the room due to the running toilet exhaust fan and possibly due to the HVAC air balance characteristics.

The inspector questioned whether a vacuum condition in the control room was analyzed during the control room habitability analyses for radiation, chlorine or toxic gas release accidents. The shift superintendent consulted with the Operations Engineer. The Operation Engineer directed the Shift Superintendent to manually initiate control room radiation isolation. The radiation isolation was initiated at about 11:30 a.m. and the control room was repressurized to greater than 0.4 in. water pressure.

The inspector reviewed the applicable sections of the FSAR to determine the bases for the habitability analyses. These included sections 9.4, 6.4 and 2.2.3. The FSAR indicated that, for the radiation isolation, the emergency fresh air system was required to maintain at least a 0.125 in-water positive pressure in the control room. Further, the analyses for chlorine and toxic gas release accidents assumed that the air inleakage into the control room would be less the 0.25 air changes per hour. The inspector determined that operation with the control room initially at a vacuum would create a time delay until the positive pressure was established during a radiation isolation and would result in increased air inleakage during chlorine and toxic gas accidents. On 1/24-25/85, the inspector discussed

his control room habitability analyses questions with the Station Superintendent and the Technical Engineer. Later on 1/28, the inspector was informed that the habitability analyses assumed an initial positive pressure in the control room, therefore, operation at a vacuum between 9:30 a.m. and 11:30 a.m. on 1/24 constituted an unanalyzed condition.

On 1/29/85, the inspector informed the Station Superintendent that operations with the control room at a vacuum without first performing an analysis to assure that control room post-accident habitability would be maintained was a violation of the requirements of 10 CFR 50.59. (50-352/85-02-03)

3.1.4 System Valve Lineup Verification

The inspector verified the operability of selected safety-related systems by performing system lineup checks which include check of valve positions, locked valve control, power supply availability, and electrical breaker positions. During this inspection period, verification checks were performed on Reactor Core Isolation Cooling System, Control Room Fresh Air Supply System, '1B' Diesel Generator, and the High Pressure Coolant Injection System (HPCI). Except for the item discussed below, no problems were identified.

On 1/22/85, the inspector questioned the position of HPCI Valve 55-1047 which is the "1B Safeguard fill pump inlet valve to HPCI pump discharge header". This valve was expected to be open according to P&ID M-55 and procedure check off list S55.1(COL) "Equipment Alignment for Automatic Operation of HPCI System" but appeared to be closed to the inspector. The inspector informed the shift supervisor of this question who then dispatched an operator to check the valve position. Valve 55-1047 was found to be closed and therefore the keep fill system was isolated from the HPCI discharge lines. This situation was not a technical concern because there was a backup method in service acting to keep the discharge pipe full at all times. In addition, an annunciator would alarm in the control room upon loss of this backup method. The licensee is conducting an investigation to determine why valve 55-1047 was in the shut position on 1/22/85. The inspector will review the results of this investigation in a future report. (50-352/85-02-04)

3.1.5 Diesel Generator Ventilation

During an inspection of the emergency AC power systems on 1/22/85, one of the ventilation fans for the D-11 diesel generator enclosure was found to be out of service. There was an equipment trouble tag on the fan switch which stated that the fan would not run continuously, but would trip off shortly after it was started. The tag was dated 12/14/84, over 5 weeks earlier. Section 9.4.6.2 of the Limerick FSAR states that the two fans per diesel generator enclosure are rated at 50% capacity each. No engineering analysis had been performed on the ventilation system with only one fan available to determine if the ventilation was sufficient for the D-11 diesel generator to be operable.

Shortly after this was brought to the attention of the licensee, an engineering calculation was performed which showed that one ventilation fan was adequate to support diesel generator operation as long as outside air temperatures were below 75°F. Due to the time of year, outside air temperatures remained below 75°F while the fan was out of service. The concern remains that licensee personnel including on-watch operators and supervisory personnel did not fully appreciate the potential significance of the out of service diesel generator enclosure ventilation fan. This omission is similar to items discussed in section 3.1.1 of this report.

No violations were identified.

3.1.6 Fire Barriers

During a routine plant tour, the inspector noticed several unsealed penetrations in the floor of the corridor outside the diesel generator enclosures down into the service water pipe tunnel directly below. The corridor is Fire Area (F/A) 124 according to the Limerick Fire Protection Evaluation Report which identifies the ceiling of the service water pipe tunnel (F/A 75) as a 3 hour rated fire barrier in section 5.4.24. When the unsealed penetrations were brought to the licensee's attention, an evaluation of the condition was performed by the licensee's engineering staff. The licensee's conclusion was that no fire barrier rating is required for the ceiling of Fire Area 75 and that the Fire Protection Evaluation Report would be revised to delete the fire barrier rating for the ceiling. The acceptability of the licensee's conclusion regarding the missing barriers will be reviewed in a future inspection. Pending this review, this issue is considered unresolved. (50-352/85-02-05)

3.2 Unit 2

The inspector periodically toured the Unit 2 reactor building, including the drywell and the Unit 2 side of the turbine building. These tours were conducted to verify adequate housekeeping and in-storage maintenance of equipment during the suspension of construction activities. No violations were identified.

4. Review of Special and Routine Reports

4.1 During this period, the inspector reviewed the Monthly Operating Reports for Limerick, Unit 1, for November and December, 1984 to assure their adequacy and accuracy.

No violations were identified.

4.2 Review of Licensee Event Reports (LERs)

The inspector reviewed the licensee event reports (LERs) listed below to determine whether: the information provided was accurate and submitted in a timely manner; the event cause was properly identified and corrective actions were appropriate; the report described a potentially generic issue; and the report satisfied the licensee's reportability requirements. These reports were found to be acceptable, however, those event reports annotated with an asterisk(*) required additional inspector followup and are discussed later in this paragraph.

* -84-012 Automatic Isolation of Reactor Water Cleanup System 12/15/84
-84-015 RHR Shutdown Cooling Isolation 11/26/84
* -84-016 Failure to Perform Surveillance Test Prior to Recirculation Pump Start 11/23/84
* -84-017 Improper Performance of a Chlorine Analyzer Surveillance Test 11/27/84
* -84-018 Failure to Sample Radwaste 11/28/84
-84-019 RHR Shutdown Cooling Isolation 11/26/84

-84-022 Inoperable Fire Penetration Seals 11/29/84
-84-023 Reactor Scram Signal during Hydrostatic Test 11/29/84
-84-024 Nuclear Steam Supply Shutoff System Isolation Signal 12/5/84
* -84-026 Reactor Water Cleanup High Ambient Temperature Isolation 12/16/84
-84-027 Failure to Sample Service Water Effluent Line 11/29/84
-84-028 Control Room Chlorine Isolation 12/9/84
-84-029 Automatic Isolation of Reactor Enclosure Ventilation System 12/20/84
-84-030 Automatic Isolation of NSSSS Outboard Valves 12/10/84
-84-031 Reactor Water Cleanup Isolation 12/11/84

-84-032 Reactor Water Cleanup Isolation 12/11/84
-84-033 Control Room Chlorine Isolation 12/11/84
*-84-034 Automatic Isolation of the Reactor Water Cleanup System 12/12/84
*-84-035 Reactor Water Cleanup Isolation 12/16/84
*-84-036 Reactor Water Cleanup High Ambient Temperature Isolation 12/17/84
-84-041 Reactor Enclosure HVAC Isolation 12/22/84

4.2.1 LERs 84-012, 84-026, 84-034, 84-035 and 84-036: discuss the automatic isolations of the Reactor Water Cleanup System as a result of an apparent defect in a temperature differential transmitter switch. The details of this defect and the licensee's corrective actions are discussed in inspection report 50-352/85-08.

4.2.2 LER 84-016: Inspection Report 50-352/84-65 item 3.1.2 discusses the inspector's followup of this event. The startup of a recirculation pump without performing the required surveillance test resulted in the issuance of violation 50-352/84-65-02. The licensee's response will be reviewed in a future inspection.

4.2.3 LER 84-017: Inspection Report 50-352/84-68 paragraph 4.1 discusses the inspector's followup of this event. As a result of this event, violation 50-352/84-68-03 was issued. The licensee's response to this violation will be reviewed in a future inspection.

4.2.4 LER 84-018: the failure to independently sample the liquid radwaste effluent line was cited as a violation in inspection report 50-352/84-65. A contributing factor to this violation was the misinterpretation of an annunciator in the radwaste control room by the operators. The annunciator window wording has been revised to more clearly describe the meaning of the annunciator. In addition, the Radwaste Operator must verify that the radiation sample rack is in service prior to each discharge. As an aid to the operators, annunciator response cards (ARC) are being prepared for each annunciator in the radwaste control room. The ARCs are designed to provide the operator with a quick and easy reference to help interpret annunciators and initiate corrective or compensatory actions.

5. Review of Allegation Concerning Bioshield Doors

NRC Region I received information on 12/29/84 which indicated that there may be hollow spots in the piping penetration doors in the bioshield between elevation 290 ft. and 300 ft.at azimuth 270^{0} in the Unit 1 drywell. In response to this allegation, the inspectors reviewed drawing C-950 to determine the penetrations potentially involved and reviewed Project Specification 8031-C-71 to determine the design of the doors.

The doors in question are used to fill piping penetrations through the bioshield to minimize radiation streaming from the reactor vessel into the drywell. The doors, constructed of a steel casing filled with concrete and borated concrete, lower the local radiation levels in the vicinity of the penetrations, thus minimizing the exposure levels of workers in the drywell during outages or operations and also minimizing the effects of radiation on the equipment located near the penetrations. The inspectors noted that these doors are not relied upon to reduce offsite doses during operations or accidents because the drywell wall would provide this function.

From review of C-950, the inspectors narrowed their concerns to the following penetrations located in the general area identified in the allegation: X2-H, X4-E, X16-D, and X20-B. On 1/16/85, the inspectors addressed the concern regarding the doors for the above penetrations to the Station Superintendent and the PECo Field Quality Assurance Branch Head. These licensee representatives agreed to investigate the matter and to describe the results of their investigation to the inspectors.

The inspectors reviewed Quality Assurance Check Report G-109 dated 1/16/85 which recorded the results of gamma and neutron surveys performed on and around the bioshield doors for penetrations X2-G, X2-H, X8-B, X2-J, X16-D, X20-B, X4-E and X5-B. These radiation measurements were taken completely around each door at approximately the average radius of the door. Additionally readings were taken directly on the bioshield in the vicinity of the penetrations. The results of these surveys were reviewed by the Senior Health Physicist and by the PECo Engineering Quality Assurance organization. The licensee's evaluations indicated that none of the doors contained concrete voids.

The inspectors reviewed the survey results and found the readings at each door to be consistent with those of other doors in the same general area of the bioshield. The inspectors had no further questions.

6. Review of Events Occurring During the Inspection

6.1 Loss of Jet Pump Flow Indication

At 11:00 p.m., 1/6/85, after reactor pressure had been increased by the operators to 600 psig, the operators noted that the individual jet pump flow indications in the Auxiliary Equipment Room and the total core flow indicator in the control room showed flow to be near zero. However, at the time, recirculation loop flow indications and jet pump flow through the 4 specially-instrumented jet pumps appeared to be as expected for plant conditions. The operators declared the jet pumps inoperable per Technical Specification (TS) 3.4.1.2. The TS action statement required the plant to be in Hot Standby in 12 hours.

Throughout the night, operators and technicians attempted to resolve the apparently anomalous indications for individual jet pump and total core flow. However, not specifically identifying the cause of the problem, the operators began driving in control rods at 5:44 a.m., 1/7 to commence a controlled shutdown. Power was decreased from about 4.2% to 1% and stabilized, and an ENS call was made. An Unusual Event was declared due to commencing a shutdown as a result of exceeding a TS Limiting Condition For Operation.

At about 7:00 a.m., senior station management and the Senior Resident Inspector arrived in the control room. Licensee management reviewed the problems and determined that the probable cause for the indicators showing near zero was a calibration problem with the individual jet pump differential pressure monitors. These monitors use jet pump throat pressure as a low pressure source and below-core-plate pressure as the high pressure source. However, there exists an approximately 12 foot elevation difference between the respective pressure taps which must be compensated to avoid erroneous d/p measurements. Apparently, during initial instrument calibration during the preoperational test program, the 12 foot water column correction factor had been calculated assuming 70^{0}F reactor coolant temperature instead of the temperature for pressurized conditions. Therefore, the correction factor overcompensated the measurements taken at temperatures higher than 70^{0}F. Review of the total flow chart (total flow sums the flows of the 20 individual jet pumps) indicated a flow decrease with each increment of pressure increase and this appeared to substantiate the licensee's analysis. Further, the licensee determined the 4 instrumented jet pump flows were unaffected because the elevation between their pressure taps is substantially less than that for the others.

To further verify its analysis, the licensee decreased reactor pressure to 400 psig. Jet pump flow indications were then observed to increase as expected. The licensee then declared the jet pumps operable and discontinued the plant shutdown. The Unusual Event was terminated at 10:50 a.m. 1/7. Pressure was maintained at 400 psig until corrective actions could be identified and implemented.

PORC met on 1/7/85 to discuss the corrective actions. PORC, with input from General Electric, decided to compensate the flow indications for the weight of water in the 12 foot column at saturation temperature for 1005 psig. RCS conditions were maintained stable at 400 psig while the instruments were recalibrated.

The inspector had no further questions and identified no violations.

6.2 Inadvertent Diesel Generator Start

At 8:52 p.m., 1/11, the D14 diesel generator inadvertently initiated and ran for about 3 minutes. Test equipment had been installed in the local control panel for D14. While technicians were removing the test equipment, the air starting system was actuated. The diesel achieved rated speed and its generator output reached rated voltage and frequency. However, because the D14 safeguard bus was energized from offsite power, the diesel generator did not close in to the bus. The systems involved were subsequently returned to their normal lineup.

6.3 Mispositioning of Fire Protection System Valves (LII)

The licensee identified on 1/21/85 that the fire protection sprinkler system isolation valves for the 304 ft. and 254 ft. elevation of the control enclosure had been closed between 1/10/85 and 1/21/85, in conflict with the requirements of Technical Specification 3.7.6.2. Upon becoming aware of the problem on 1/22/85, the resident inspector inquired about the event's causes and corrective actions. On 1/29/85, the licensee's Regulatory Engineer provided the following information.

Maintenance Request Form (MRF) 8500282 had been issued to implement design change MDCP-0157. This design change modified the piping configuration for several fire hose lines in the control enclosure. To support work under the MRF, permit 1-22-0083 was issued and tags applied to valves which would isolate the work area from other parts of the fire suppression system. The modification was implemented, then a hydrostatic test was performed by Bechtel Construction Inc. (BCI) personnel, invoking the controls of construction job rule JR-M-1. According to the job rule and to hydrostatic test procedure 1M-13A-104, BCI personnel were authorized to operate valves within the boundaries specified by blocking permit 1-22-0083 to establish the hydrostatic test boundaries. Consequently, valves HV 22-1055 and HV 22-1056 were closed to isolate their associated sprinkler headers from the piping undergoing the test. The test was satisfactorily conducted on 1/10/85, however, the valves which formed the hydrostatic test boundaries were not subsequently restored by BCI personnel because the test procedure did not discuss system restoration.

The MRF was returned to Operations following its closeout by the responsible maintenance organization. The Shift Technical Advisor (STA) onshift when the MRF was returned reviewed it to determine the operational verification requirements to be performed prior to returning the affected portion of the fire protection system to service. However, none were specified. Therefore, the only valve restoration checks were those associated with clearance of the work area boundary tags shown on permit 1-22-0083. The two closed sprinkler isolation valves remained closed until this condition was identified on 1/21/85.

Regarding corrective actions taken or planned, the Regulatory Engineer indicated that the licensee had issued a letter to BCI to restrain BCI personnel from operating plant equipment. Further, the construction job rule was to be no longer used for control of testing and was to be superceded by an operations-oriented Bechtel maintenance procedure. Additionally, the licensee had identified the need to further define the operational verification requirements to be applied to MRFs and to provide further guidance in this regard to the STAs.

The inspector considered the event described above as being a licensee identified item and will review the corrective actions taken by the licensee during a subsequent inspection. (50-352/85-02-06)

6.4 Recirculation Pump Speed Increase Transient

At 1:14 p.m., 1/25/85, a speed increase transient occurred on the B recirculation pump which caused the pump speed to increase from 28% to about 48% speed, the current setpoint of the recirculation motor generator (MG) scoop tube mechanical stop. The transient resulted after I and C technicians plugged a Gould strip recorder (Model number 2800W) into jacks used to monitor parameters in the recirculation MG speed control circuitry. The effect of the Gould recorder on the circuitry was that the sensed MG speed went to zero causing the speed demand signal out of the controller to go to 100% speed. Additionally, the loss of valid MG speed indication resulted in the 28% speed limiter not being able to limit MG speed.

An SRM period annunciator alerted the Unit 1 operator to the reactivity insertion caused by the pump speed increase who then noted the 100% demand signal decreasing. It is believed that the I & C technicians had removed the Gould recorder from the control circuitry which then resulted in the recirculation speed MG automatically recovering to its 28% limiter setpoint.

The licensee calculated the change in reactor power by applying the average percent change shown on the 6 IRM channels being recorded in the control room (i.e., 24%) to the average APRM readings obtained from the 6 channels indicated in the Auxiliary Equipment Room earlier in the morning (3.86%). The end result was then (3.86) (1.24)=4.786%.

The licensee performed a test subsequent to recovering from the event and determined that the Gould instrument design was such that the MG speed control circuitry was adversely affected (i.e., event resulted from a misapplication of the Gould instrument).

This event and the licensee's investigation will be reviewed in detail in inspection report 50-352/85-06.

6.5 Inadvertent Water Curtain Actuation

At about 6:25 p.m., 1/24/85, the fire protection water curtain which is directed at a combustible free zone in the south corridor of elevation 217 of the reactor enclosure was actuated. The water curtain actuation was alarmed in the main control room and operators responded to the scene. Finding no valid need for the water curtain, the operators terminated the actuation. It was estimated that the curtain had operated for about 5 minutes, releasing 2000-3000 gallons of water onto the floor at elevation 217.

In the vicinity of the combustible free zone are the A and C residual heat removal (RHR) pump access plugs. These plugs were installed at the time of the event, but, as designed, they did not provide a leak-tight seal at the floor. Consequently, the water which had accumulated on the floor leaked around these plugs and onto the A and C RHR pump motors located on elevation 177. No other important equipment on the 177, 201 or 217 elevations of the reactor enclosure were wetted down during this event.

The A and C RHR pumps were declared inoperable by Operations personnel, pending the results of an electrical megger check of their motors. These megger checks were completed satisfactorily and the pumps were returned to service at about 5:30 a.m., 1/25/85. The A RHR pump was subsequently run with the RHR system in the suppression pool cooling mode.

The inspector discussed this event with the Regulatory Engineer and the Administrative Engineer to determine the possible causes for the inadvertent actuation of the water curtain. Additionally, the inspector toured the areas in the reactor enclosure affected by this event. The inspector learned that the water curtain was designed to be manually initiated from a pull box located in the southwest reactor enclosure stairwell. The pull box was identified as a fire alarm on the box itself, however, a sign on the wall beneath the box stated that the box was a water curtain actuation control. Additionally, during discussions with the licensee's representatives, the inspector learned that the water curtain could have been actuated as a result of either intentional or accidental operation of the pull box. However, the icensee had not been able to determine the exact cause.

The licensee's representatives agreed to continue their review of this event to identify its cause and to prescribe corrective actions. The inspector will monitor the licensee's actions in this regard.

7. Monthly Surveillance Observation

The inspector observed surveillance test ST-2-001-604-1 "NSSSS-Main Steam Line Pressure-Low; Channel A (Line A) Functional Test (P1S-01-1N676A)"to verify that the test had been properly approved by shift supervision, control room operators were knowledgeable regarding the test, approved procedures were being used, test instrumentation was calibrated and test acceptance criteria were met.

No unacceptable conditions were identified.

8. Monthly Maintenance

The inspector periodically reviewed the status of selected maintenance request forms (MRF) to verify compliance with the station's administrative procedures and to track the status of maintenance on safety related equipment. Maintenance activities associated with the repair and installation of the High Pressure Coolant Injection System (HPCI) turbine governor servo (MRF #8501473) were discussed with licensee and vendor personnel. Paragraph 9 discusses this issue in detail.

No violations were identified.

9. Replacement of the Remote Servo For the High Pressure Coolant Injection (HPCI) Turbine Speed Controller

On 1/26/85, with HPCI in an inoperable status, the remote servo for the Woodward governor on the HPCI turbine was replaced with one from the Unit 2 turbine. The inspector reviewed the documentation available on 1/28/85 to verify that the environmental qualifications of the HPCI turbine had not been affected. Included in this review were General Electric Field Disposition Instructions (FDI) 107-73030 and 123-73030, which governed changes to the HPCI turbine made in 1984 to assure its environmental qualification and a draft Field Deviation Disposition Report (FDDR), which covered the replacement of the Unit 1 remote servo with that from Unit 2. Also the inspector discussed the work that had been accomplished with a General Electric Startup representative.

The inspector learned that, on 1/26/85, the Unit 1 remote servo, Woodward part number 9903-060, had been replaced with unit 2's, designated as Woodward part number 8250-079, because of difficulties experienced in tuning the speed controller. The replacement part was different in appearance and design from the Unit 1 part, but it was considered by GE to be functionally equivalent. The GE representative indicated that verbal approval had been obtained from an engineer in GE's San Jose office to use the replacement part. A maintenance request form was approved to control the work activity and the draft FDDR was initiated to document the change in the configuration of the HPCI system.

The inspector requested that GE or the licensee provide, for his review, an engineering analysis or qualification report that would show that part 8250-079 was an environmentally qualified replacement for part 9903-060. While GE and the licensee attempted to locate this information, the Station Superintendent directed that HPCI not be declared operable. The information requested by the inspector was later determined to be unavailable and subsequently the licensee and GE decided to refurbish the Unit 1 remote servo and reinstall it.

The inspector discussed the activities performed on 1/26/85 with the Station Superintendent and expressed a concern regarding the implementation of a change to a safety-related system using verbal authorizations as a basis for the acceptability of the change. The inspector informed the licensee that no violations of NRC requirements were identified in this instance because HPCI was considered to be inoperable throughout the period in which the unqualified part was installed.

The inspectors had no further questions at the time.

10. Unresolved Items

Unresolved items are matters about which more information is necessary to ascertain whether they are violations, deviations, or acceptable items. An unresolved item is discussed in paragraph 3.1.6 of this inspection report.

11. Exit Meeting

The NRC resident inspector discussed the issues and findings in this report throughout the inspection period and at an exit meeting held with Messrs. J. Corcoran and G. Leitch on February 4, 1985. At this meeting the representatives of the licensee indicated that the items discussed in this report did not involve proprietary information.

No written material was provided to the licensee during this period.