UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-280/89-24 and 50-281/89-24

Licensee: Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060

Docket Nos.: 50-280 and 50-281 License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: July 30 - September 2, 1989

Inspectors: M. S. Lewis for — 9-26-89
W. E. Holland, Senior Resident Inspector — Date Signed

M. S. Lewis for — 9-26-89
J. W. York, Resident Inspector — Date Signed

M. S. Lewis for — 9-26-89
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Approved by: M V Sinkule for — 9-27-89
P. E. Fredrickson, Section Chief — Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine resident inspection was conducted on site in the areas of plant operations, plant maintenance, plant surveillance, licensee event report review, and followup on inspector identified items.

Certain tours were conducted on backshifts or weekends. Backshift or weekend tours were conducted on July 30, August 1, 6, 7, 13, 20, 25, 27, 31, and September 2.

Results:

During this inspection period, three violations were identified. The violations identified were:

- Failure to comply with the requirements of Technical Specification 3.0.1 with regards to the action statement (paragraph 3.f (4)).
- Failure to follow procedures as required by Technical Specification 6.4 when performing periodic test 1-PT-15.1C, involving the monthly operability test for the turbine driven auxiliary feedwater pump (paragraph 6.a).

- Failure to test station batteries within the specified intervals as required by Technical Specification 4.6.C (paragraph 6.b).

In addition, apparent violations were identified for:

- Failure of personnel to follow procedures regarding high radiation area access requirements (paragraph 3.b). This apparent violation will be reviewed by the NRC for appropriate enforcement action.

- Failure to take appropriate corrective action for past problems identified during performance of maintenance activities (paragraph 5.a). This apparent violation will be reviewed by the NRC for appropriate enforcement action.

One inspector followup item (paragraph 3.b) was identified for followup on licensee evaluation of differences in dosimetry readout.

One inspector followup item (paragraph 5.b) was identified for followup on licensee review of electrical contractor breaker overhaul practices.

One inspector followup item (paragraph 8) was identified for followup on the licensee's review of internal station communication issues.

A weakness (paragraph 9) was noted in the licensee's process for determining reportability of events as required by 10 CFR 50.72.

A strength (paragraph 3.d) was noted regarding the housekeeping and cleanliness condition of the Unit 1 safeguards valve pit and pump pit areas.

REPORT DETAILS

1. PERSONS CONTACTED

Licensee Employees

*W. Benthall, Supervisor, Licensing
*R. Bilyeu, Licensing Engineer
*R. Blount, Superintendent of Technical Services
*E. Brennan, Supervisor, Mechanical Maintenance
*D. Christian, Assistant Station Manager
*D. Erickson, Superintendent of Health Physics
*E. Grecheck, Assistant Station Manager
*M. Kansler, Station Manager
*J. McCarthy, Superintendent of Operations
G. Miller, Licensing Coordinator, Surry
*J. Ogren, Superintendent of Maintenance
*T. Sowers, Superintendent of Engineering
*A. Price, Site Quality Assurance Manager

Other licensee employees contacted included control room operators, shift technical advisors, shift supervisors and other plant personnel.

*Attended exit interview.

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Plant Status

Unit 1 began the reporting period in power operation. The unit operated at power for the duration of the inspection period.

Unit 2 began the reporting period in a cold shutdown condition. The licensee completed the majority of maintenance activities in preparation for heatup above 200 degrees F. Operation activities accomplished during this period included fill and vent of the RCS, establishment of proper primary plant chemistry, and drawing of a pressurizer bubble. In addition, special testing of the 2H emergency electrical bus was completed. At the end of the inspection period, the unit remained in cold shutdown.

3. Operational Safety Verification (71707)

a. Daily Inspections

The inspectors conducted daily inspections in the following areas: control room staffing, access, and operator behavior; operator adherence to approved procedures, TS and LCOs; examination of panels containing instrumentation and other RPS elements to determine that required channels are operable; and review of control room operator

logs, operating orders, plant deviation reports, tagout logs, jumper logs, and tags on components to verify compliance with approved procedures.

b. Weekly Inspections

The inspectors conducted weekly inspections in the following areas: verification of operability of selected ESF systems by valve alignment, breaker positions, condition of equipment or components, and operability of instrumentation and support items essential to system actuation or performance. Plant tours were conducted which included observation of general plant/equipment conditions, fire protection and preventative measures, control of activities in progress, radiation protection controls, physical security controls, plant housekeeping conditions/cleanliness, and missile hazards. The inspectors routinely monitored the temperature of the AFW pump discharge piping to ensure that increases in temperature were properly monitored and evaluated by the licensee.

During this inspection period, the licensee identified two problems associated with the radiological protection program at the station. Both problems were identified by the licensee as violations of TS 6.4.B. The license and regulatory requirments, a description of the apparent violations, and the licensee's corrective actions are as follows.

10 CFR 19.12 requires in part that all individuals working in or frequenting any portions of a restricted area shall be instructed to observe, to the extent within the workers control, the applicable provisions of the Commission regulations for the protection of personnel from exposure to radiation occurring in such areas.

TS 6.4.B.1 requires, in part, that control of entry of personnel into radiation areas greater than 1 rem/hr be provided by locked barricades to prevent unauthorized entry. The TS also requires that any individual or group of individuals permitted to enter a high radiation area be provided with a radiation monitoring device which continuously indicates the dose rate in the area.

TS 6.4.D requires that radiation control procedures be followed. The licensee's Radiation Protection Plan, Chapter II, Attachment II-1 requires, in item 2, that individuals obey posted, verbal, and written HP instructions.

HP procedure 5.3.20, Initiating, Using, Extending, and Terminating an RWP, Section 4.3.1.d, requires checkout of a survey meter and high radiation area keys for entry into a high radiation area, if required by a RWP.

On August 7, 1989, licensee personnel informed the inspector that an individual was observed on the excess letdown flats, a locked, posted

high radiation area in the Unit 2 containment. The individual was performing work in the area without authorization from HP to enter the area. Radiation levels in the area ranged from a 1.2 R/hr hot spot to 80 mrem/hr general area dose rate. When questioned by an HP technician, the individual related that he called the HP rover on the plant communication system but did not get any response. The individual then entered the excess letdown flats by circumventing the locked high radiation barrier (a ladder) via a charcoal filter bunker, and climbed into the area. The HP rover directed the worker to immediately exit the area and report to the HP control point. HP determined the worker's dose for the entry to be 3 mrem. Failure of personnel to follow the station radiation protection procedures by obtaining HP authorization and access keys prior to entering a locked, high radiation area, as required by 10 CFR 19.12 and TS 6.4.D, is identified as an example of apparent violation 281/89-24-04.

When licensee management became aware of the event, all work in the RCA was halted. On August 8, 1989, special 1 and 1/2 hour sessions were conducted with all radiation workers at the station concerning compliance with station HP requirements. During the meetings, senior station management made it clear to the station and contractor staffs that adherence to procedures and attention to detail in all areas were required. Those who believed differently were told to consider terminating their employment at the station.

The second problem, which occurred on August 9, involved two contract workers entering a high radiation area in the Unit 2 containment without a dose rate meter. After approximately five minutes, the workers realized their mistake and exited the area. Similar to the first instance, when the problem became known to HP personnel, immediate actions were taken. The licensee identified the violation in a deviation report and excluded the workers that were involved from the RCA. HP determined that the two workers' doses were 3 mrem and 5 mrem for the entry. Dose rates in the area ranged from 5 mrem/hr to 150 mrem/hr. Additional corrective actions included posting of watches at the entrance of each high radiation area to ensure that workers have proper instructions and radiological equipment prior to entering the area. Failure of personnel to have a dose rate monitoring device when entering a high radiation area, as required by HP procedure 5.3.20, 10 CFR 19.12, and TS 6.4.B.1 is identified as another example of apparent violation 281/89-24-04.

Both violations were immediately identified to the inspector and discussions were held with licensee management. In each case, the persons involved were terminated from working at the station. Licensee management made it known to all employees that termination would be the action taken for future violations of radiological requirements. These two events are a continuation of four previously identified NCVs (IR No. 280, 281/89-23). The inspector also noted

that a similar violation of high radiation access areas occurred in May 1988.

On August 17, 1989, the licensee informed the inspector that a maintenance worker received a radiation dose in excess of his assigned administrative limit when working on a check valve in the Unit 2 containment. The administrative overexposure was recorded on the worker's gonad dosimetry as being approximately 821 mrem. This dose, when added to the worker's previous exposure, totaled 1802 mrem for the quarter; 52 mrem higher than the assigned administrative limit of 1750 mrem. The licensee conducted an investigation into the administrative overexposure and concluded that all actions taken by the mechanics and HP technicians on the job were appropriate. The licensee further concluded that all personnel involved were familiar with the exposure rates in the area and responded proactively to stay time limits and SRD readings. However, the licensee was in the process of evaluating the differences between the readings of the SRDs and the TLDs when the report period ended. This issue will be reviewed by regional HP inspectors during subsequent inspections and is identified as IFI 280,281/89-24-06, followup on licensee evaluation of differences in dosimetry readouts.

c. Biweekly Inspections

The inspectors conducted biweekly inspections in the following areas: verification review and walkdown of safety-related tagouts in effect; review of sampling program (e.g., primary and secondary coolant samples, boric acid tank samples, plant liquid and gaseous samples); observation of control room shift turnover; review of implementation of the plant problem identification system; verification of selected portions of containment isolation lineups; and verification that notices to workers are posted as required by 10 CFR 19.

d. Other Inspection Activities

Inspections included areas in the Units 1 and 2 cable vaults, vital battery rooms, steam safeguards areas, emergency switchgear rooms, diesel generator rooms, control room, auxiliary building, Unit 1 and Unit 2 containments, cable penetration areas, independent spent fuel storage facility, low level intake structure, and the safeguards valve pit and pump pit areas. Reactor coolant system leak rates were reviewed to ensure that detected or suspected leakage from the system was recorded, investigated, and evaluated; and that appropriate actions were taken, if required. The inspectors routinely independently calculated RCS leak rates using the NRC Independent Measurements Leak Rate Program (RCSLK9). On a regular basis, RWPs were reviewed and specific work activities were monitored to assure they were being conducted per the RWPs. Selected radiation protection instruments were periodically checked, and equipment operability and calibration frequency were verified.

During the inspector's tour of the Unit 1 safeguards valve pit and pump pit areas, it was noted that these areas had recently been decontaminated and released as clean areas. Of particular note was the condition of the valve pit area where several safety-related MOVs are located. The inspector noted that all components appeared to be in good working order and that the general cleanliness in this difficult-to-access area was excellent. The inspector believes that the conditions observed during this tour is a positive indicator of improvements in working and material conditions.

On August 22, 1989, during a routine walkdown of the Unit 1 SI system, the inspectors noticed that the flow orifice for flow element FE-1946 was installed backwards. This is the flow element that measures discharge flow from the low head SI pump 1-SI-P-1B. The inspectors identified this discrepancy to the licensee and expressed concern over the operability of the pump and the method for installing flow orifices. The licensee declared the pump inoperable at 1535 hours on August 22 and entered a 24 hour LCO to reverse the orifice and test the pump. The pump was tested satisfactorily and returned to service at 0800 hours on August 23. Further discussion regarding the installation of this orifice is included in paragraph 5.

e. Physical Security Program Inspections

In the course of monthly activities, the inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities to include: protected and vital areas access controls; searching of personnel, packages and vehicles; badge issuance and retrieval; escorting of visitors; and patrols and compensatory posts.

f. Licensee 10 CFR 50.72 Reports

(1) On July 31, 1989, the licensee made a report in accordance with 10 CFR 50.72 concerning to the tripping of the auxiliary building normal ventilation supply and exhaust fans. These fans will trip on a SI signal so that the ventilation system is realigned to filtered exhaust (emergency alignment); however, no SI signal was present. The licensee initially determined that the fans tripped due to a decrease in air pressure in the fan's pneumatic control header caused by the opening of four air operated dampers. At the time of the event, the dampers were being opened by control room operators as part of a normal evolution. Additional engineering investigation revealed that the actuation occurred due to a combination of leaking mechanical connections on the pneumatic control header, and the operation of the four dampers, reducing the IA header pressure below the trip setpoint. An LER was submitted on this event on August 30, 1989. The inspectors will address the licensee's corrective actions during closeout of the LER.

(2) On August 13, 1989, the licensee made a report in accordance with 10 CFR 50.72 regarding an inadvertent ESF actuation of one of the two auxiliary building emergency ventilation fans. The actuation was due to improper landing of electrical leads on a pressure switch, causing the automatic operation of the "B" train emergency ventilation fan. Immediate corrective actions included proper retermination of the electrical leads and returning the emergency ventilation fan to service. The licensee initiated an HPES review of this problem and will address the resultant findings after management review. The licensee will also submit an LER. The inspectors will review the HPES findings and licensee's corrective actions during closeout of the LER.

(3) On August 14, 1989, the licensee made a report in accordance with 10 CFR 50.72 concerning an automatic start of the Unit 2 "B" charging pump (high head SI pump). The event was caused by a operator inadvertently bumping the pump start switch out of the "pull to lock" position (the switch was not properly engaged in that position). The pump auto-started due to low discharge header pressure. The low pressure indication was based on the fact that no other pumps were running due to the unit being in a cold shutdown condition. During the event, the charging pump discharge flowpath was isolated for other testing, preventing flow to the RCS. This event occurred on August 13 and was determined to not be reportable; however, a determination was made the next day that the event should be reported as an information call.

(4) On August 15, 1989, the licensee made a report in accordance with 10 CFR 50.72 concerning the failure to accomplish the required TS surveillance testing on the Unit 1 RPS permissive interlock P-10 prior to unit startup. The surveillance requirements are contained in TS 4.1.A.2 and TS Table 4.1-A. The licensee discovered the problem during an ongoing review of the TS surveillance requirements. After identification of the missed surveillance to the SNSOC, the licensee entered TS 3.0.1, which requires that the unit be placed in hot shutdown within the next six hours. The licensee prepared a JCO for the discovered condition; and, after review and approval by the SNSOC, the licensee exited TS 3.0.1. Testing on the P-10 interlock logic was completed on August 16, and at that time a SNSOC review determined that all required testing had been accomplished. The licensee made a followup call to the NRC.

After review of the event by the NRC on August 16, the licensee was questioned with regards to their exiting TS 3.0.1 without either taking the shutdown action required by TS 3.0.1, or completing the P-10 surveillance requirement of TS 4.1.A.2. The licensee concluded that after the JCO had been prepared and approved addressing compensatory measures, the appropriate

actions had been completed to exit TS 3.0.1. After further discussion of this issue with the NRC, licensee senior management agreed that incorrect action was taken and the correct action in the case would have been to comply with TS 3.0.1 or request discretionary enforcement. Failure to comply with the requirements of TS 3.0.1 is identified as violation 280/89-24-01.

(5) On August 18, 1989, the licensee made a report in accordance with 10 CFR 50.72 regarding an inadvertent ESF actuation of the Unit 2 "A" train Phase 1 recirculation mode transfer system. The actuation was caused by inadvertent touching of an electrical contact by an electrician while connecting a jumper to an adjacent circuit in accordance with a modification procedure. The licensee will submit an LER on this event.

g. Restart Readiness Assessment Review - Unit 2

During this inspection period, the inspectors monitored the licensee's management review of all functional areas associated with the return to operation of Unit 2. These functional areas included operations, maintenance, surveillance, engineering, radiological controls, safety assessment, and quality verification. The management team involved in these reviews included the Station Manager, the two Assistant Station Managers, the Quality assurance Manager, and the Assistant Vice President, Nuclear Operations. The initial reviews of each functional area were held on August 1, 1989. The reviews consisted of the superintendents of the functional areas addressing why their area of responsibility should be considered ready for restart.

The following items were reviewed in each functional area:

- Operations - Material condition walkdowns, housekeeping walkdowns, safety system lineups, chemistry control readiness, annunciator review, system status log requirements, action statement log requirements, temporary modification log status, post-maintenance testing, selected critical valve third checks, and required startup training.

- Maintenance - Material condition walkdowns, work order backlog, MOV issues, check valve issues, steam generator issues, preventative maintenance status, and electrical 4160V and 480V breakers.

- Surveillance - Periodic testing program, American Society of Mechnical Engineers Section XI program, erosion/corrosion program, and Type B and C testing.

- Engineering - EWR backlog review, Type 1 backlog review, technical reviews of DCPs and EWRs, MOV issues, snubbers, root

cause evaluations, applicable JCOs, electrical terminations, ESF testing, IA system, and drawings update.

- Radiological Controls - Contaminated area reduction, personnel contamination reports, exposure evaluation, hot spot reduction, contamination controls, lead shielding, HP technician availability and effectiveness, and radiological engineering controls.

- Safety Assessment - NRC commitments, commitment tracking system items, operational events, HPES recommendations, industry experience, North Anna startup issues review for applicability, TS changes, and SNSOC reviews of deviation report backlog.

The inspectors attended this meeting and agreed with the licensee's conclusion that, in general, there was too much work outstanding to allow an effective restart decision process. Presentations by the QA Manager and the HP Superintendent were noted to be thorough and comprehensive. Within the areas inspected, one violation and one apparent violation were identified.

4. Operational Readiness Assurance Program Review - Unit 2 (71710)

During the inspection period, the inspectors conducted a review of the licensee's QA organization's overview of activities associated with Unit 2 operational readiness assurance program implementation. The inspectors noted that the QA performance group conducted independent walkdowns on portions of the IA, SI, AFW, and CCW systems located in Unit 2 containment. All of these systems were previously walked down by the systems engineers. The QA walkdowns were performed to provide an assessment of the systems engineers walkdowns. A list of discrepant conditions found by QA, some of which had been identified by engineering, and others that appeared not to have been identified, was submitted to engineering for review. Some of the conditions noted by QA were as follows:

- Valves not labeled - Of the ten valves identified by QA as not having tags, one valve was missed by the systems engineer.

- Incomplete bolting thread engagement - During the walkdown of Unit 1, incomplete bolting thread engagement was also found on some of the components, but all of these were evaluated by design engineering as acceptable (full thread engagement is not required to develop the full strength of a bolt). The systems engineers used the experience gained on Unit 1 to determine that similar thread engagements found on Unit 2 were acceptable. Evaluations were made by the systems engineers but were not recorded on inspection documentation.

- Teflon tape on threaded connections in the IA system and at solenoid operated valves in the SI system - Engineering stated that the use of

teflon tape is not an operational concern and will not result in the failure of a component to perform its intended function.

- Material discrepancies such as leaks, missing bolts on junction boxes, broken electrical conduit connections, supports not painted, and rust on some components - Nine of the twenty-seven items identified by QA were also identified and recorded by the systems engineers. Most of the leaks and rusty areas were evaluated by the systems engineers during the walkdowns as not being significant and were therefore not recorded. Some of the other discrepancies were not part of the walkdown criteria, nor the walkdown boundary, or occurred due to work or some other activity after the systems engineers performed their walkdowns.

- Two 1/2 inch diameter lines and four level transmitters not appearing to meet seismic class I requirements - Instead of performing the calculations to determine whether the supports or lack of in certain areas would have been adequate in a seismic event, the decision was made to add or modify supports.

- Paint splatter on SI piping - Unit 1 also had paint splatter on some of the piping and the condition was evaluated as not being detrimental. The painting work procedure was recently revised to address splatter protection.

The systems engineers had been instructed to make some decisions during the walkdown based on the experience gained in the review and resolution of Unit 1 walkdown items. The QA engineers had conducted their overview walkdowns of selected systems based on original requirements stated in the engineering package. These original requirements were to identify all discrepancies and not to use engineering judgement in deficiency identification. EWR 88-584A, which was used for walkdowns, had a field change added to clarify the systems engineers instructions for the Unit 2 walkdown.

On August 18, 1989, QA, systems engineering, and an NRC inspector entered the Unit 2 containment to determine the status of the items identified in the previous QA walkdown. The items that engineering stated would be corrected before startup were either completed or in the progress of being completed. Another walkdown by QA and systems engineering was performed on August 21, 1989. This walkdown was performed on the CCW system from the containment penetrations to the reactor containment air recirculation coolers. This area was chosen because a QC inspector had written a station deviation on rusted piping penetrations in this area. No additional significant issues were identified during this walkdown. The inspectors concluded, based on review of the systems engineers and QA walkdowns, that appropriate resolution of disparities identified in the walkdowns for Unit 2 were adequate.

Within the areas inspected, no violations or deviations were identified.

5. Maintenance Inspections (62703 & 42700)

During the inspection period, the inspectors reviewed maintenance activities to assure compliance with the appropriate procedures. Additional effort was focused on verifying that previously identified problems had been adequately corrected.

a. Maintenance Corrective Action Issues

A review of several work packages revealed inconsistencies in maintaining system cleanliness and the methods for obtaining torque values for system fasteners. These are two areas that have been previously identified as being deficient. For example, IR 280, 281/88-28 issued a violation identifying a programmatic breakdown in the controls and procedures used to maintain system foreign material exclusion. In addition, several examples of improper torquing were identified during the service water SSFI inspection (IR 280, 281/88-32), and a violation was issued in a letter dated May 18, 1989. The inspectors focused on these two areas of inconsistencies and identified numerous examples, as detailed below, where the corrective actions taken in response to the above violations were ineffective. The inspectors also focused on installation of orifices after identifying a case where an orifice was installed incorrectly. Failure to take appropriate corrective actions for previously identified maintenance problems is identified as apparent violation 280, 281/89-24-05.

Near the end of the inspection period, the licensee implemented a new administrative procedure to address the cleanliness requirements. Also, a new maintenance procedure for orifice plate inspections was implemented. These procedures were identified to the inspectors; however, their effectiveness has not been determined and will be reviewed during future inspections.

(1) Cleanliness Control

The licensee opened and repaired several SI check valves during the inspection period. These check valves were worked because of identified internal and/or body to bonnet leakage concerns. Some of the valves identified as having internal leakage are interface valves between the RCS and the SI system. The inspectors reviewed the work associated with several check valves in the Unit 2 SI system. This work was performed on 6 inch Velan check valves in accordance with maintenance procedure MMP-C-SI-195. The specific valves and accompanying work orders reviewed by the inspectors are as follows:

- 2-SI-79 Work Order #3800084254

- 2-SI-88 Work Order #380084170

- 2-SI-91 Work Order #3800084320
- 2-SI-226 Work Order #3800071696
- 2-SI-241 Work Order #3800084253

During these reviews, the inspectors were informed that on August 14, 1989, a bolt was inadvertently dropped into the body of SI check valve 2-SI-79. The bolt was from a machine that was being installed and adjusted for lapping the valve seat. The bolt was later found and retrieved from the RCS primary loop piping.

As a result of the above incident, the inspectors reviewed the licensee's program for foreign material exclusion, including compliance with their response to an NRC enforcement action taken last year involving programmatic weaknesses in this area. The licensee's response, dated December 9, 1988, stated that the Superintendent of Maintenance issued a standing order to ensure that foreign material is prevented from entering a system or component during the performance of maintenance activities. The inspectors reviewed maintenance standing order 88-1, dated July 29, 1988, System Cleanliness, and concluded that implemen-tation of this order has been ineffective. Specific deficiencies noted are as follows:

- Item 4 of the standing order mandates that requirements be deviated into a procedure to either install a temporary cover on all openings or an individual be assigned to continuously monitor the openings and an inspection performed to ensure cleanliness immediately prior to sealing the opening. This was not accomplished in that MMP-C-SI-195 did not contain the specific requirements.

- Item 7 of the standing order requires that all personnel, including contractors, performing work that involves opening a system or component shall read and sign to acknowledge that they have read the standing order. Contrary to this requirement, personnel performing work inside the check valves did not read and sign to indicate an understanding of the standing order.

The inspectors concluded that the licensee has not effectively implemented the corrective actions developed in response to previous violations regarding foreign material exclusion. Discussions with maintenance department personnel and a sampling of other maintenance procedures indicates that this weakness was widespread in most work involving open systems. Additional examples of this weakness are discussed in paragraphs 5.a(3) and 5.a(4). Compliance with instructions specified in maintenance standing orders is further hampered by the fact that the main-tenance department does not have a procedure that defines the

implementation and use of standing orders. In addition, the maintenance department does not have a program in place to ensure that craft personnel are aware of the standing order requirements. Although it was evident that an effort was made to establish and maintain an accountability area for work on check valve 2-SI-79, a decision was made within the maintenance department to proceed with the job in lieu of developing an acceptable method of foreign material exclusion. The dropped bolt into check valve resulted in expending 2.735 mrem to find and retrieve it, and also required the RCS water level to be maintained for a longer period of time in a reduced inventory condition. The weaknesses in the implementation of the cleanliness program for maintenance activities associated with the preceeding check valve repairs are identified as an example of apparent violation 280, 281/89-24-05, for failure to take appropriate corrective action for past problems identified during performance of maintenance activities.

(2) Fastener Torquing Issues

During this inspection period, the licensee identified several problems associated with appropriate material identification/ torquing of the check valve fasteners. Based on these identified discrepancies, the inspectors reviewed the following work packages with regards to the licensee's program for indentification and torquing of fasteners:

- 2-SI-79 Work Order #3800084254
- 2-SI-88 Work Order #3800084170
- 2-SI-91 Work Order #3800084320
- 1-SI-FE-1946 Work Order #3800076509

The inspectors reviewed maintenance standing order 89-1, dated May 22, 1989, Torque Values. Upon examining the above listed work packages, the inspector noted that the following items of the standing order were not being adhered to in some of the packages:

- Item 1 of the standing order states that all torque values listed in procedures will be verified by maintenance engineering prior to torquing, and this individual will initial the torque value in the procedure. In the work packages for 2-SI-91 and 1-SI-FE-1946, torquing values for the flange bolts were not verified and initialed by maintenance engineering as required. It was later determined that the 2-SI-91 valve hinge bolts were overtorqued without any reference in the procedure of the required torque value.

- Item 5 of the standing order states that if a maintenance engineering representative is not available on site, torque value verification may be made by telephone and noted on the procedure or work order. In work packages for 2-SI-91 and 1-SI-FE-1946, torque value verification was not noted on the procedure or work order.

- In the package for check valve 2-SI-88, a maintenance transmittal form stated that if the hinge bracket bolts were ASTM SA 193 grade B6, to torque the bolts to 50 to 75 ft-lbs, but if the bolts were grade B8, to torque the bolts to 16 to 25 ft-lbs. The transmittal further stated that if the bolt material cannot be verified, torque to the lower range of values. Although the material for this valve was not identified in the package, hinge bracket bolts inside the valve were torqued to 50 ft-lbs.

A review of the above work packages revealed an inadequate implementation of the corrective actions specified in the standing order dealing with torque values. Inconsistencies were noted regarding the method for obtaining and documenting the necessary torque values. The inspectors selected additional maintenance flange and valve procedures and found numerous examples of inadequate implementation of the standing order. The licensee performed an engineering evaluation and determined that the applied torque was acceptable for 2-SI-88 and 91. The evaluation was documented in EWR 89-579 and reviewed by the inspector. The weaknesses in the implementation of the torquing requirements for maintenance activities associated with the preceeding check valves and orifice flange repairs is identified as an additional example of apparent violation 280, 281/89-24-05.

(3) Flow Orifice Installation

As noted in paragraph 3.d of this report, the inspectors discovered that flow orifice for flow element FE-1946 was installed backwards in the Unit 1 SI system. This orifice is a beveled-type plate that is used to measure the discharge flow from a low head SI pump. Installation of the orifice in a reverse orientation introduces an indeterminate error in the indicated flow value.

The licensee documented this discrepancy via station deviation S1-89-1869. The last time this orifice was worked was on June 12, 1989, per work order 3800076509, which invoked procedure MMP-C-G-201.1, Corrective Maintenance Procedure For Blank Flanges, Spectacle Flanges and Orifice Plate Flanges, dated June 10, 1988. Steps 5.4.6 and 5.4.7 of this procedure required the mechanic to obtain orientation information from operations and maintenance engineering prior to installation. The procedure

used on June 12 indicates that the mechanic obtained the correct orientation information. Step 5.4.9 of the procedure required the mechanic to install the orifice and document the orientation. This step was signed as being performed, but the orientation was not documented. The inspectors also noted that the maintenance procedure does not require an independent verification of the orifice installation.

While verifying the inspector's conclusion that the orifice was installed backwards, the licensee's systems engineer noted that flow orifice 1-SI-FE-1941 was also installed backwards. This condition was documented via station deviation S1-89-1880. The licensee implemented a walkdown of selected safety-related orifices and found one additional orifice installed backwards.

The licensee has had problems with properly installing flow orifices. The inspectors previously identified reversed orifices in the AFW system as documented in IR 280, 281/88-18. Further licensee inspections at that time revealed additional orifices in safety-related systems installed backwards and resulted in a violation documented in IR 280, 281/88-28, dated August 12, 1988. The weaknesses in the maintenance program for ensuring the correct installation of orifices are identified as an additional example of apparent violation 280, 281/89-24-05.

The inspectors also reviewed MMP-C-G-201.1 for compliance with the cleanliness and torquing standards, and found additional examples where corrective actions were inadequate. For example, the orifice flange was broken and remade without a visual inspection and verification to ensure system cleanliness as required by maintenance standing order 88-1. In addition, the torque values used were not verified by maintenance engineering as required by maintenance standing order 89-1. The weaknesses in this procedure with regards to cleanliness and torquing control are identified as an additional example of apparent violation 280, 281/89-24-05,

(4) PORV Block Valve Repair

The inspectors reviewed the failure of the pressurizer PORV block valve 2-RC-MOV-2536 that occurred on July 24. Mechanics had completed the installation of a new motor operator (Limitorque) and had turned the valve over to the electricians for wiring and testing. The wiring of the valve operator was performed and the work was independently QC-verified prior to clearing the tags for thrust testing. A subsequent attempt to cycle the valve resulted in the valve going hard into the seat, cracking the upper bearing housing. The cause was determined to be incorrect wiring that resulted in the torque switch being bypassed in the closed direction.

The inspectors reviewed the following documentation pertaining to this event:

- Work Order #3800083005, authorizing disconnecting and reconnecting the motor operator.

- Maintenance Procedure EMP-C-MOV-11, Disconnect and Connect MOV's.

- Station Deviation S2-89-672, identifying the failure.

- EWR 89-537, dated 8/6/89, Evaluate RC Valve (2-RC-MOV-2536).

- EWR 89-522, dated 7/29/89, Evaluate RC Valve Internals (2-RC-MOV-2536).

- EWR 89-137, dated 7/3/89, Evaluation/Standardization Of Rising Stem MOVS.

- Maintenance Procedure EMP-C-MOV-151, Testing MOVs Using MOVATS System.

The corrective actions performed by the licensee involved disassembly and inspection of the valve body. The valve is a 3 inch 1500 lb. Velan gate valve equipped with a SMB-00 Limitorque motor operator. Engineering estimated that the force exerted during this event was between 39,000 and 43,000 lbs. The valve has a one time allowable limit of between 19,000 and 20,000 lbs. for the temperatures the valve was experiencing at the time of overthrusting. The valve seats were liquid penetrant tested and the indications were removed by grinding and/or lapping. In addition, a new stem and wedge were installed. The motor operator was removed, diassembled and repaired by replacing the damaged parts. Station engineering, with concurrence from the valve manufacturer, concluded that a total valve replacement was not required.

The licensee was unable to determine a definitive cause of the wiring error. Interviews with the electrician and QC inspector involved did not reveal any defective technique or cause for the error. Both individuals believed that the valve operator was properly wired when they left the job site. The procedures reviewed by the inspector appeared to be correct with no apparent contribution to the problem. The inspector did note, however, that several additional problems were identified with the wiring during an as-found inspection following the event. Step 5.11.6 of procedure EMP-C-MOV-11 documented the as-found inspection, the findings of which included defective control wire lugs, excessive grease in the compartment, heat shrink markers not shrunk, annunciator wiring loose, and a motor lead connection less than hand tight. The inspector discussed the

specifics pertaining to these problems with the station engineers and maintenance staff, and concluded that the cause was predominantly a result of poor workmanship. The Superintendent of Maintenance agreed and offered comments that indicated that this is an isolated case involving the poor workmanship of a specific electrician. This is plausible given the large number of Limitorque overhauls performed over the last several months with relatively few problems noted. The inspectors will continue to monitor the performance of the electrical maintenance staff involved in MOV work.

The inspector reviewed the procedure (EWR 89-522) that inspected and repaired the PORV block valve for compliance with the system cleanliness requirements of maintenance department standing order 88-1 (reference paragraph 5.a(1) for information on this standing order). The valve is located above the pressurizer, just upstream of the PORV. Although step 4.2 of EWR 89-522 states that foreign material exclusion is important and requires temporary covers or constant surveillance, there was no evidence that an independent visual inspection was performed prior to system closure as required by item 3 of the standing order. In addition, documentation that all applicable individuals had read and understood the standing order prior to beginning work could not be produced as required by item 7 of the standing order. The weaknesses in this procedure regarding cleanliness control is identified as an additional example of apparent violation 280, 281/89-24-05.

b. 480 Volt Switchgear Failure

On August 13, the inspector witnessed starting of the Unit 1 outside recirculation spray pump 1-RS-P-2A in accordance with surveillance procedure 1-PT-17.3. The amber breaker disagreement light came on indicating a problem with the 480 volt breaker 1-RS-PMO-2A. This condition was documented via station deviation S1-89-1834, and work order 3800084724 was issued to investigate the failure. Results of this investigation indicated that the trip rod in the breaker control device was not adjusted in accordance with the vendor manual.

The licensee reviewed the procedures and technique used by an outside contractor that performed overhauls on the breaker and found them to be adequate. Discussions with the breaker manufacturer indicated that the trip rod adjustment is set and should not vary with age or breaker cycles. Corrective action performed by the licensee included randomly selecting five breakers from Unit 2 and verifying the correct trip rod adjustment. After inspection of three of the five breakers, the licensee determined that some misadjustment was apparent.

The licensee conducted a review in the training center of the steps involved in the adjustment process; the inspectors witnessed this

review. From the review, the licensee concluded that the misadjustment was not an immediate safety concern due to the large margin of tolerance available. The licensee further determined that if the misadjustment was in one direction, the breaker would still perform its function if it successfully passed post-maintenance testing. If the misadjustment was in the other direction, the breaker would not operate as required to make the adjustment. Although the licensee was able to demonstrate that safe breaker operation was not a concern, the inspector questioned the contractor's overhaul practices in assuring quality. The licensee was in the process of reviewing this issue when the inspection period ended. This issue is identified as IFI 280, 281/89-24-07, followup on licensee review of electrical contractor breaker overhaul practices.

Within the areas inspected, one apparent violation was identified.

6. Surveillance Inspections (61726 & 42700)

During the reporting period, the inspectors reviewed various surveillance activities to assure compliance with the appropriate procedures as follows:

- Test prerequisites were met.
- Tests were performed in accordance with approved procedures.
- Test procedures appeared to perform their intended function.
- Adequate coordination existed among personnel involved in the test.
- Test data was properly collected and recorded.

Inspection areas included the following:

a. AFW Testing

The inspectors reviewed the surveillance test performed on AFW turbine-driven pump 1-FW-P-2, on August 1, 1989. This test was conducted using periodic test procedure 1-PT-15.1C, Turbine Driven Auxiliary Feedwater Pump (1-FW-P-2), dated July 25, 1989. The inspectors expressed concern that the turbine speed was adjusted from 3965 RPM to 4200 RPM prior to obtaining test data. This situation was the subject of previous concerns because of the potential to overpressurize the downstream piping. For example, if the turbine speed is adjusted up during a pump run, the possibility exists that during the next pump start the turbine governor may allow enough overshoot to overpressurize the downstream components. Overpressurization is of particular concern when considering the type of governor used on the turbines and the lack of a relief valve in the discharge piping. Although it appears that the piping was not

overpressurized during the above case, the licensee is planning to replace the governor and add a relief valve. An additional concern of the inspectors was that the adjustment of speed prior to obtaining pump data may mask the existence of an inoperable pump.

The licensee agreed with the above inspector's concerns, and documented the problem via station deviation report S1-89-1791. The test was again performed on August 2 and determined to be acceptable. The adjustment of the turbine speed on August 1, is not allowed by procedure 1-PT-15.1C, and is identified as violation 280/89-24-02, for failure to follow procedures as required by TS 6.4. The inspectors discussed the issue with operations supervision and believe that appropriate sensitivity to concerns of this nature has been fully disseminated to the operations staff.

b. Battery Surveillance Testing

The inspectors reviewed the status of electrical battery surveillances and expressed concern regarding the number of surveillances performed outside the allowable grace period provided by TS. Discussions with the engineering group that tracks the performance of periodic tests indicate that from August 1988, until August 1989, 11 out of a total of 617 battery surveillances were not performed within the period allowed by TS. The inspectors reviewed other selected tests and concluded that the battery tests are an exception in that the remainder of surveillance tests are, as a rule, performed as scheduled.

On August 22, the inspector discussed the above concern with applicable maintenance management. It appears that although engineering is notifying the correct persons within the electrical maintenance department of pending tests, these key personnel are not ensuring compliance with the specified test intervals. TS 4.6.C.1 requires certain battery tests to be performed within specified time intervals (every week, month, 3 months, etc..). TS 4.0.2 further allows a 25 percent grace period for testing intervals to accommodate normal test schedules. The failure to comply with the allowable TS intervals for station battery tests is identified as violation 280,281/89-24-03.

c. Unit 2 "H" Bus Special Testing

During the last week of this inspection period, the inspectors witnessed performance of selected portions of special tests 2-ST-238, ESF Actuation with Instantaneous UV - H Bus; and 2-ST-240, ESF Actuation with Delayed UV (5 Min) - H Bus. The purpose of the tests was to verify loads sequencing onto the 2H electrical bus following the injection of an ESF signal along with a simultaneous and a delayed UV condition on the emergency bus. The inspectors reviewed the official copy of the test procedures prior to performance of the test and witnessed the actual testing, including the actions of the test directors. Testing was conducted in a satisfactory manner.

Within the areas inspected, two violations were identified.

7. Licensee Event Report Review (92700)

The inspectors reviewed the LER's listed below to ascertain whether NRC reporting requirements were being met and to determine appropriateness of the corrective actions. The inspector's review also included followup on implementation of corrective action and review of licensee documentation that all required corrective actions were complete. LERs that identify violations of regulations and that meet the criteria of 10 CFR, Part 2, Appendix C, Section V are identified as NCVs in the following closeout paragraphs. NCVs are considered first-time occurrence violations which meet the NRC Enforcement Policy for exemption from issuance of a Notice of Violation. These items are identified to allow for proper evaluations of corrective actions in the event that similar events occur in the future.

(Closed) LER 280/88-07, Control/Relay Room Chillers Inoperable Due to Inadequate Service Water Flow. The issue involved tripping of one of the subject chillers with a second chiller in a maintenance condition. This condition is contrary to TS 3.14. The immediate corrective action involved returning the chiller to service after manually adjusting the SW flow to the chiller condenser. The manual adjustment was necessary because the normal pressure control valves were out of service. Additional corrective actions included replacement of the SW pressure control valves. The inspector verified that the pressure control valves had been replaced and that the system was operating satisfactorily. This LER is closed.

8. Allegation on Gai-tronics Communication Paging System (RII 89-A-0056)

a. Background:

An anonymous individual, herein after referred to as the alleger, contacted a Region II inspector on June 10, 1989, and reported that 50 percent of the Gai-tronics (paging/communication system throughout the plant) does not work, and that the trend over the last few years has been to have more of the stations out of service.

b. Allegation Inspection:

The Gai-tronics system is a five channel public address and intercom system. The system is normally used in daily operational activities to communicate messages between individuals in the station. In the event of an emergency, the system is used to alert station personnel of any abnormal occurrence or emergency situation and to communicate emergency messages between individuals. There are a total of four communications systems, including Gai-tronics, that are used in the station. The inspectors reviewed a number of work orders related to the Gai-tronics system and the average number of days necessary to complete these orders. A discussion with the head of the electrical maintenance group (group responsible for the maintenance on this

system) revealed that a problem does exist in maintaining the system. Part of the problem is due to plant personnel stuffing rags in the speakers, damaging the handsets, etc. Currently, an effort is underway to improve both the Gai-tronics and the power telephone systems. A task group is evaluating locations for communications units and state-of-the art improvements for the Gai-tronics system. The task group will submit a report, along with recommendations, to corporate management within the next three months.

c. Conclusions:

Fifty percent of the Gai-tronics communication system being out of order could not be substantiated. However, the fact that problems exist in maintaining the system was admitted to by the licensee. The licensee has a task group that is scheduled to submit to corporate management within the next three months, a proposal for improving this communication system. This situation does not constitute an immediate safety concern nor is it a restart item for Unit 2. However, this item is identified as IFI 280, 281/89-24-08, followup on the licensee's review of internal station communication issues.

9. Action on Previous Inspection Findings (92701)

(Closed) URI 280/89-21-03, Additional review of reportability in accordance with 10 CFR 50.72 of two events which resulted in loss of safety-related components. The issues involved the tripping of the control room air conditioning units, and the air binding of the charging pump SW pumps. The loss of the charging pump SW pumps resulted in the charging pumps becoming technically inoperable. Additional reviews by the NRC concluded that these two events should have been reported in accordance with 10 CFR 50.72. Since identification of the issue, the licensee has redefined their reporting threshold. Therefore, the inspector believes that this issue is resolved. However, the item did identify a weakness in the licensee's past process for determining reportability of events in accordance with 10 CFR 50.72.

10. Exit Interview

The inspection scope and findings were summarized on September 5, 1989, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed below. The licensee acknowledged the inspection findings with no dissenting comments. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

The following violations were identified:

Failure to comply with the requirements of TS 3.0.1 with regards to the action statement (paragraph 3.f(4), 280/89-24-01).

Failure to follow procedures as required by TS 6.4 when performing periodic test 1-PT-15.1C, involving the monthly operability test for the turbine driven AFW pump (paragraph 6.a, 280/89-24-02).

Failure to test station batteries within the specified intervals as required by TS 4.6.C (paragraph 6.b; 280, 281/89-24-03).

In addition, apparent violations were identified for:

Failure of personnel to follow procedures regarding high radiation area access requirements (paragraph 3.b). This apparent violation will be reviewed by the NRC for appropriate enforcement action (281/89-24-04).

Failure to take appropriate corrective action for past problems identified during performance of maintenance activities (paragraph 5.a). This apparent violation will be reviewed by the NRC for appropriate enforcement action (280, 281/89-24-05).

One IFI (paragraph 3.b) was identified for followup on licensee evaluation of differences in dosimetry readout (280, 281/89-24-06).

One IFI (paragraph 5.b) was identified for followup on licensee review of electrical contractor breaker overhaul practices (280, 281/89-24-07).

One IFI (paragraph 8) was identified for followup on the licensee's review of internal station communication issues (280, 281/89-24-08).

A weakness (paragraph 9) was noted in the licensee's process for determining reportability of events as required by 10 CFR 50.72.

A strength (paragraph 3.d) was noted regarding housekeeping and cleanliness conditions of the Unit 1 safeguards valve pit and pump pit areas.

11. INDEX OF ACRONYMS AND INITIALISMS

AFW	-	AUXILIARY FEEDWATER
CCW	-	COMPONENT COOLING WATER
CFR	-	CODE OF FEDERAL REGULATIONS
CW	-	CIRCULATING WATER
DCP	-	DESIGN CHANGE PACKAGE
EMP	-	ELECTRICAL MAINTENANCE PROCEDURE
ESF	-	ENGINEERED SAFETY FEATURE
ESW	-	EMERGENCY SERVICE WATER
EWR	-	ENGINEERING WORK REQUEST
F	-	FAHRENHEIT
FT-LB	-	FOOT-POUND
HP	-	HEALTH PHYSICS
HPES	-	HUMAN PERFORMANCE EVALUATION SYSTEM

IA	-	INSTRUMENT AIR
IE	-	INSPECTION AND ENFORCEMENT
IFI	-	INSPECTOR FOLLOWUP ITEM
IR	-	INSPECTION REPORT
JCO	-	JUSTIFICATION FOR CONTINUED OPERATION
LB	-	POUND
LCO	-	LIMITING CONDITION FOR OPERATION
LER	-	LICENSEE EVENT REPORT
MOV	-	MOTOR OPERATED VALVE
MREM/HR	-	MILLIREM/HOUR
NCV	-	NON-CITED VIOLATION
NRC	-	NUCLEAR REGULATORY COMMISSION
OP	-	OPERATING PROCEDURE
PM	-	PREVENTATIVE MAINTENANCE
PORV	-	POWER OPERATED RELIEF VALVE
PSI	-	POUNDS PER SQUARE INCH
PSIG	-	POUNDS PER SQUARE INCH GAUGE
PT	-	PERIODIC TEST
QA	-	QUALITY ASSURANCE
QC	-	QUALITY CONTROL
RCA	-	RADIOLOGICALLY CONTROLLED AREA
RCS	-	REACTOR COOLANT SYSTEM
REM	-	ROENTGEN EQUIVALENT MAN
RPM	-	REVOLUTIONS PER MINUTE
RPS	-	REACTOR PROTECTION SYSTEM
RWP	-	RADIATION WORK PERMIT
SI	-	SAFETY INJECTION
SNSOC	-	STATION NUCLEAR SAFETY AND OPERATING COMMITTEE
SRD	-	SELF-READING DOSIMETER
SSFI	-	SAFETY SYSTEM FUNCTIONAL INSPECTION
SW	-	SERVICE WATER
TLD	-	THERMOLUMINESCENT DOSIMETER
TS	-	TECHNICAL SPECIFICATIONS
URI	-	UNRESOLVED ITEM
UV	-	UNDERVOLTAGE
VS	-	VENTILATION SYSTEM