UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-280/93-15 and 50-281/93-15

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: June 6 through July 3, 1993

Inspectors:

M. W. Branch Senior Resident Inspector — Date Signed 7/29/93

S. G. Tingen, Resident Inspector — Date Signed 7/29/93

Approved by:

G. A. Belisle, Section Chief
Division of Reactor Projects — Date Signed 7/30/93

SUMMARY

Scope:

This routine resident inspection was conducted on site in the areas of plant status, operational safety verification, maintenance inspections, safety assessment and quality verification, Technical Specification review program, Updated Final Safety Analysis Report improvement program, Level I project tracking, and licensee event review. During the performance of this inspection, the resident inspectors conducted reviews of the licensee's backshifts, holiday or weekend operations on June 20 and 25.

Results:

In the operations area, the following items were noted:

URI 50-280,281/93-15-01, Use of probalistic risk assessment (PRA) for Unreviewed Safety Question Determination, pending further review by the NRC (paragraph 3.c).

Failure to test the low pressure carbon dioxide fire protection system per Technical Specification 4.18.D.1.b.2 was identified as part 1 to Non-Cited Violation 50-280,281/93-15-04 (paragraph 9). Failure to establish a continuous fire watch in accordance with Technical Specification 3.21.B.4 was identified as part 2 to Non-Cited Violation 50-280,281/93-15-04 (paragraph 9).

In the maintenance/surveillance functional area, the following items were noted:

Non-Cited Violation 50-281/93-15-02, was identified for failure to perform minor maintenance in accordance with VPAP-2002 (paragraph 4.a).

Non-Cited Violation 50-280,281/93-15-03 was identified for failure of personnel to sequence tie-in cleanliness and fit up/tack inspections in accordance with VPAP-0903 (paragraph 4.b).

In the safety assessment/quality verification area, the following items were noted:

The licensee's multi-tiered self-assessment programs collectively incorporate various levels of corporate and station management in ensuring safe operation. These programs are effective in contributing to problem prevention by monitoring and evaluating plant performance and following up with corrective action recommendations (paragraph 5).

The Corporate Nuclear Safety Independent Review Group provided effective safety evaluaiton independent review (paragraph 5.d).

The Integrated Trend Report identified recurring problems through adverse trends, provided various problem/event in-depth reviews and provided valid recommendations for corrective action (paragraph 5.d).

The Station Nuclear Safety Operating Committee was effective in evaluating proper substitution of manual operating action for automatic actions and consequently ensuring that corrective actions prevented recurrence of specific problems (paragraph 5.g).

Station Nuclear Safety's station deviation and trending review have improved identifying and correcting recurring problems (paragraph 5.h).

Although the Updated Final Safety Analysis Report improvement program is progressing, a date has not be determined for completing the program (paragraph 7).

The Level I Corporate and Station Project Tracking programs demonstrated management's involvement in activities critical to station performance and also provided an additional method for ensuring that adequate corrective actions are implemented (paragraph 8).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

* J. Artigas, Supervisor Quality Assurance
* R. Bilyeu, Licensing Engineer
  R. Blount, Superintendent of Engineering
* D. Christian, Assistant Station Manager
* J. Costello, Station Coordinator, Emergency Preparedness
* D. Erickson, Superintendent of Radiation Protection
  R. Gwaltney, Superintendent of Maintenance
* R. Gardner, Outage and Planning Department
* H. Hay, Supervisor, Quality Assurance
* R. Hayes, Supervisor, Corporate Quality Assurance
* M. Kansler, Station Manager
* A. Keagy, Supervisor, Nuclear Materials
* C. Luffman, Superintendent, Security
* R. MacManus, Acting Superintendent, Engineering
* J. McCarthy, Superintendent of Operations
* A. Price, Assistant Station Manager
* R. Saunders, Assistant Vice President, Operations
* E. Smith, Site Quality Assurance Manager
* D. Sommers, Supervisor, Corporate Licensing
* J. Swientoniewski, Supervisor, Station Nuclear Safety

NRC Personnel

* M. Branch, Senior Resident Inspector
* S. Tingen, Resident Inspector

* Attended Exit Interview

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

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 was at power at the end of the inspection period, day 143 of continuous operations.

Unit 2 began the reporting period in power operation. On June 20, the unit tripped during a manual turbine runback from 100% power that was initiated due to the A MFWP failure. This transient is discussed in detail in section 3.b. The unit was restarted the same day and since only one MFWP was available, the unit operated at reduced power (i.e., 65%) for the remainder of the inspection period.

3. Operational Safety Verification (71707, 42700)

The inspectors conducted frequent tours of the control room to verify proper staffing, operator attentiveness and adherence to approved procedures. The inspectors attended plant status meetings and reviewed operator logs on a daily basis to verify operations safety and compliance with TSs and to maintain awareness of the overall operation of the facility. Instrumentation and ECCS lineups were periodically reviewed from control room indication to assess operability. Frequent plant tours were conducted to observe equipment status, fire protection programs, radiological work practices, plant security programs and housekeeping. Deviation reports were reviewed to assure that potential safety concerns were properly addressed and reported.

a. June 20, Unit 2 Reactor Trip on Loss of the A MFWP

At 4:14 a.m., on June 20, Unit 2 tripped during a manual turbine runback initiated from 100% power as required by procedures when the A MFWP tripped. The MFWP tripped when one of the 2 electric driving motors shorted to ground causing the feeder breaker to trip. The reactor tripped on feed/steam flow mismatch consistent with a low SG level initiated from the A SG channels. A combination of steam dump actuation, SG shrink and swell from pressure swings, the loss of the MFWP, and the cold AFW injection caused the SG level instability. The licensee notified the NRC as required on this event.

The inspectors monitored the licensee's recovery actions subsequent to the trip and performed an independent review of plant transient and recorder charts. Based on this review, the inspectors determined that the plant responded as expected and that the ECCS and reactor protective systems actuated as designed. There were some plant equipment problems that required investigation and repairs prior to unit restart. The equipment problems and licensee's corrective actions included the following:

- The IRPI for rod M-10 indicated approximately 25 steps off of the bottom and the rod bottom light was not lit after the reactor trip. Approximately 40 minutes later after the RCS temperature stabilized the rod bottom light illuminated and the IRPI indication drifted toward 0. DR S-93-0799 was submitted and the licensee's research indicated that the IRPI for this rod had previously experienced sluggishness and this condition had been evaluated by engineering. The licensee performed a calibration of this IRPI prior to unit restart. All rods fully inserted into the core on the reactor trip.

- The B RCP high/low oil alarm annunciated. DR S-93-0804 was submitted and was resolved by draining a small amount of oil from the reservoir.

- Following the reactor trip the intermediate range NIs decreased off-scale low. DR S-93-0798 was submitted and the detectors were calibrated.

- Several additional BOP equipment problems were experienced during the transient and they were evaluated and resolved prior to unit restart.

The inspectors attended the MRB and SNSOC post trip review prior to unit restart. The inspectors also attended the operating crew debriefing after the trip and prior to their leaving the site. The licensee's post trip process appeared to be effective in evaluating and resolving important plant equipment issues prior to unit restart.

The unit was restarted at 6:47 p.m., on June 20 and was back on-line at 10:33 p.m., that same day. The unit operated at reduced power (approximately 65%) for the remainder of the inspection period.

b. Plants Readiness to Cope With Adverse Weather Conditions

The inspectors reviewed the licensee's procedures and programs to cope with adverse weather conditions if they should arise. The inspection considered the design basis of equipment and structures that would be exposed to wind forces from either a tornado or a hurricane to include emergency response and event assessment equipment. The inspectors held meetings with both site and corporate personnel knowledgeable in wind loading design. The inspectors used Surry drawing 11448-FY-1D Revision 17, Plot Plan Surry Power Station, as the basis for discussing the wind loading design for the major structures and equipment.

Equipment and structure design is described in sections 2.2.2 and 15.2 of the UFSAR. Table 15.2-1 list structures and equipment and their design basis. A tornado wind speed of approximately 300 mph and a hurricane wind speed of 137 mph were assumed in the UFSAR analysis. However, the design wind loading basis for all equipment and structures located at the plant are not described. New buildings such as the administration building and the new radwaste facility are also not included.

From the UFSAR review and discussions noted above, the inspectors determined that many structures and equipment exposed to the maximum winds from a hurricane or tornado could be damaged and may not survive. For example, non-safety related structures and equipment are generally designed to the BOCA code, which for the location and function of Surry as a power station would be designed to withstand a wind force of approximately 100 mph.

Examples of BOCA designed structures and equipment include but are not limited to the following:

- LEOF
- TSC
- New Security and Administrative Building
- OSC
- CAS/SAS
- New Radwaste Building
- Switchyard and Transformers
- Fire Tanks
- Above Ground EDG Fuel Oil Tank
- Meteorological Towers and Emergency Sirens
- Environmental Monitoring Stations

In addition to the above, the roofs and siding of several other buildings are also only designed for BOCA code winds. For example, the Auxiliary Building roof and some above ground siding are designed for 100 mph winds.

There is also semi-permanent installed equipment such as hydrogen tanks, water processing trailers and Sea-Vans that may not survive design basis wind forces. In addition, loose low level rad waste is stored in a metal storage shed within the protected area. This shed is designed for BOCA code winds.

The inspectors also reviewed abnormal operating instruction AOI 0-AP-37.01 revision 1, Abnormal Environmental Conditions, which provides guidance for operations to ensure safe plant conditions in the event of impending adverse weather conditions. This procedure established the licensee's philosophy for unit conditions based on weather forecast, time before land fall, emergency plan implementation, and management's heightened awareness or degrading conditions. The licensee's emergency declaration is described in EPIP-1.01 Attachment 1, Emergency Action Level Table (TAB L) Natural Events.

The inspectors also held meetings with the corporate EP manager and an OER person to discuss the status of the licensee's review of lessons learned from Hurricane Andrew and any corrective actions being implemented. The licensee's lesson learned review is being conducted through their normal OER process. The licensee indicated that the OER report will be finalized and issued to management in the mid-summer timeframe. The inspectors also reviewed an informal checklist that contained, in bullet form, many significant "What-To-Dos" but there was little or no "How-To-Dos". The licensee indicated that the checklist could be used if needed in the event of adverse weather. The inspectors concluded that although the licensee's program has not been completely formalized, the modifications that have been made represent improvement over their previous program.

c. Feedwater Isolation System Review

During a station deviation review, the inspectors became aware of DR S-93-0774 which described a possible unreviewed safety question associated with isolating the feedwater system. Feedwater isolation is needed to protect against the consequences of a steam line failure that could cause a pressurization of the containment or a RCS cooldown with a loss of reactor shutdown margin.

The feedwater isolation function is described in the UFSAR, section 14.3.2. A detailed description is not provided but the system consists of a safety related protective system that is actuated by an SI signal which causes automatic closure of all three pairs of air operated FWRVs and bypass FWRVs and the tripping of the MFWPs. Additionally, the tripping of the MFWPs through non-safety related breakers causes the non-safety related discharge valves (1 or 2-FW-MOV-150 or 250A&B) which are powered from non-safety electrical busses to close.

In the past, Surry has disabled (jacked) a FWRV in the open position to a specific SG; therefore, it would not automatically close on an SI signal. The licensee performed SEs (i.e., 10 CFR 50.59) reviews for this evolution since 1989. Recent SEs determined that jacking the valve open to perform maintenance on the control or feedback circuitry was an acceptable practice as long as the redundant tripping of the MFWPs was operable and compensatory actions were in place to close another non-safety feedwater isolation MOV (1 or 2-FW-MOV-154 or 254A, B, C) just up stream of the FWRV, from the control room if necessary.

DR S-93-0774 was issued because of the licensee's independent review group's assessment of the SE 92-173, dated September 24, 1992, which addressed placing a FWRV on its jack. The package reviewed included administrative control form (AC S2-92-807) and TS interpretation (TSI-014), including safety evaluation (SE 92-173B). The independent review group's report to the station, attached to the DR, indicated that for certain postulated cases, termination of feedwater flow during a steam line break accident may not be achievable with current compensatory actions and within the time frame assumed in the steam break accident analysis. The following information was taken from that report:

The safety evaluation (SE 92-173B) assumes that the feedwater isolation will occur within 30 seconds through closure of the feedwater isolation MOVs. For a total LOOSP, the MFWP and condensate pumps will shutdown due to a loss of electrical power thereby terminating feedwater within the required time. However, the SE did not address the impact of a partial loss of station service electric power. A potential scenario is that a loss of a 4160V station service bus with one FWRV jacked open could result in continuous feedwater flow to the SG that has experienced a MSLB. The combination of a feedwater isolation MOV and MFWP

discharge MOV loosing power, MFWPs tripped on the SI signal, and the condensate pump continuing to run (from the unaffected station service busses), results in continued feedwater flow. This scenario assumes a MSLB upstream of the MSTVs and the single failure being a loss of a 4160V station service bus. Feedwater flow would continue until the operators locally closes the feedwater isolation MOV or trips the condensate pump. The time required to perform these compensatory actions would be greater than the 30 seconds assumed in the safety analysis.

After being informed of the above potential unreviewed safety question item, the plant initiated actions to evaluate the condition and determine reportability. The station's review resulted in generating another SE (93-142) and a TS interpretation that allows plant operations to continue with an administrated 8-hour AOT for an inoperable FWRV (i.e., jacked open). The new SE was based on reliability and probability considerations which the licensee considered acceptable by NSAC-125, Guidelines for 10 CFR 50.59 Safety Evaluations. The licensee also considered that manual operator action to trip the FWRV off the jack and allow it to close within the 30 second time limit would be achievable and acceptable.

The inspectors questioned the use of probability assessment in making the decision that the modification (i.e., loss of automatic isolation of main feedwater) does not constitute an unreviewed safety question. It is clear that the inability to automatically terminate feedwater flow was not considered in the safety analysis described in the UFSAR. Therefore, the probability of occurrence or consequences of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report may be increased. The licensee's calculation (S-896) reviewed by the inspectors indicated that the combined increase in probability for the event described was insignificant if an AOT of 8 hours is used. The licensee, therefore, considered it acceptable to operate with the FWRV on the jack if an AOT did not result in an increase in probability of occurrence.

The licensee's recent SE (93-142) also indicated that the operators could close the jacked open FWRV within the 30 seconds needed to terminate feedwater flow for the steam break accident. However, the SE contained statements that the basis was limited risk associated with operating on the jack and not dependent on strict operator performance to close the FWRV within the 30 seconds assumed. If it could be demonstrated that manual action was addressed by a procedure and could be reliably performed within the values bounded by the accident analysis, it appears that the guidance of GL 91-18 could apply for future occasions.

The inspectors held discussions with NRC staff and were informed that the use of NSAC-125 has not been endorsed by the NRC. Therefore, the use of a probability assessment is in question.

This item is identified as URI 50-280, 281/93-15-01, Use of PRA for Unreviewed Safety Question Determination, pending further review by the NRC.

d. Housekeeping

In an effort to upgrade station housekeeping, the Assistant Station Manager is walking down areas of the station with the supervisors responsible for housekeeping in the area. On June 9, the inspectors accompanied the Assistant Station Manager and I&C Supervisor on a housekeeping tour of the auxiliary building 45 foot level. During this tour, general material condition and cleanliness were monitored and out of the way places such as under and behind equipment were inspected. Examples of items noted during the tour were red tape on cable tray covers, coat hanger wire dangling from conduit, damaged label plates, loose junction box covers, and loose fasteners on ventilation equipment. The inspectors noted that during the inspection period, the Vice President of Nuclear Operations conducted a similar walkdown of the auxiliary building basement. The inspectors concluded that housekeeping has improved and management walkdowns have contributed to the improvement.

Within the area inspected, one URI was identified.

4. Maintenance Inspections (62703) (42700)

During the reporting period, the inspectors reviewed the following maintenance activities to assure compliance with the appropriate procedures.

a. Leak Repair at Mechanical Joint

On June 14, the inspectors witnessed the licensee repairing a leaking mechanical joint in the piping/tubing to charging pump 2-CH-P-1B suction pressure gage 2-CH-399. The mechanical joint was disassembled, inspected and reassembled. This maintenance was considered minor maintenance and accomplished in accordance with deficiency card IC-93-0175. The maintenance was isolated utilizing operator standby and the joint was leak tested when placed back into service. The inspectors reviewed Attachment 13 of VPAP-2002, Work Request and Work Order Tasks, dated January 1, 1993. The attachment describes criteria for determining which tasks are considered minor maintenance and can be performed with deficiency cards. Maintenance accomplished per deficiency cards is generally simple in nature and does not require a WO or written instructions. Item (d) of Attachment 13 states that minor maintenance shall not effect the integrity of safety related components and disassembly of a safety-related component is not a minor maintenance activity. The inspectors concluded that disassembling the mechanical joint in the

piping/tubing to pressure gage 2-CH-399, a safety related system, per a deficiency card IC-93-0175 was not in accordance with Item (d) of Attachment 13. This was identified as NCV 50-281/93-15-02, Failure to Perform Minor Maintenance in Accordance With Administrative Procedure VPAP-2002. This NRC identified violation is not being cited because criteria specified in Section VII.B of the NRC Enforcement Policy were satisfied. As corrective action, a change to VPAP-2002 was initiated to allow disassembly of components in safety related systems in some instances.

b. Welding a Service Radiation Monitor

The inspectors reviewed part of a modification for the Unit 2 radiation monitor for the RS heat exchanger SW cooling lines. This radiation monitor's function is to detect any tube leak in the RS heat exchanger. The review was conducted on the documentation for welding on the line going to the C radiation monitor, mark number 2-SW-P-5C. There are approximately 16 welds in this piping section.

During the inspector's welding and inspection documentation review, the licensee stated that a contractor employee had questioned whether a hold point was being bypassed when the tie-in cleanliness inspection and the fit up/tack inspections were both performed at the same time. The licensee concluded that this was an acceptable practice. The inspectors performed an independent assessment of this conclusion.

The inspectors reviewed the weld data sheet and the appropriate procedures that were associated with welding and QC hold points. A typical data sheet review shows that the first QC hold point is the tie-in cleanliness and the second QC hold point is the one for fit up/tack. The inspectors reviewed administrative procedure VPAP-0504, Technical Procedure Writers Guide, revision 1. In the definition part of this procedure (paragraph 4.5), a required QC hold point is defined as a pre-selected location written in a procedure that identifies a portion or portions of the procedure which requires witnessing by the QC department personnel or the maintenance QMT personnel. The procedure also states that work shall not progress beyond the established hold point until the required inspection is performed.

Attachment number 14 of this procedure gives the criteria for QC hold points in procedures. Paragraph 6 of this attachment gives the required QC hold points for welding procedures pertaining to safety-related and seismic items. Part 6.d states in part that cleanliness inspection of piping and piping components may be a part of the fit up/tack inspection. This would allow the QC inspectors to perform both of these inspections at the same time. However, the statement that the cleanliness inspection may be a part of the fit up/tack inspection was not part of the procedure

VPAP-0903, Control of Welding, revision 0, which was being used for the weld inspection.

Administrative procedure VPAP-0903 was reviewed for a description of the attributes to be inspected for the welding process. Attachment 2 to that procedure states that the tie-in cleanliness inspection is intended to insure that nothing is left in the pipe before fit up. The cleanliness inspection as part of the fit up/tack inspection was not included in the procedure. Discussions with some of the licensee's QC inspectors revealed that they perform both inspections at the same time on occasions when no adverse affects are possible. The decision as to when to perform both of these inspections at the same time is made by the individual QC inspector.

The inspectors discussed this decision with the QC inspector that made the decision relating to the contract employee's fit up. The QC inspector stated that there would be no problem inspecting the attributes required by the cleanliness hold point since the length of the two inch diameter pipe was two inches with an open end. The inspectors agree that technically the inspection for cleanliness could have been performed at the time of the fit up/tack inspection, but VPAP-0903 did not have the words that would authorize the performance of both inspections at the same time. The inspectors disagreed with the licensee's original conclusion that it was acceptable to perform the tie-in cleanliness and fit up/tack inspections simultaneously when performing these inspections in accordance with VPAP-0903. Failure of personnel to sequence tie-in cleanliness and fit up/tack inspections in accordance with VPAP-0903 was identified as NCV 50-280, 281/93-15-03. This NRC identified violation is not being cited because criteria specified in Section VII.B of the NRC Enforcement Policy were satisfied.

The licensee is currently changing VPAP-0903 to include the option for performance of both the cleanliness and tie in/tack inspections at the same time as it is authorized in the VPAP-0504.

Within the areas inspected, two NCVs were identified.

5. Safety Assessment and Quality Verification (40500)

The inspectors reviewed the licensee's activities associated with safety policy implementation, station performance, safety review committees, and feedback from self assessment programs and QA activities. A multi-tiered program utilizing corporate and station resources are utilized to accomplish these activities. The specific areas reviewed were the Nuclear Business Plan, NOB, MSRC, CNS, Nuclear Quality Assurance, MRB, SNSOC, and Station Nuclear Safety. Some of these functions are specifically required by TS and other areas are performed in addition to TS requirements.

a. Nuclear Business Plan

The inspectors reviewed the Virginia Power Nuclear Business Plan Goal Performance for May 1993. The purpose of this report is to assess the performance of Surry and North Anna in meeting their established goals. The report assesses plant performance, nuclear/industrial safety, cost management and regulatory compliance. Items assessed in the report were categorized as significant strengths, satisfactory, improvement needed or significant weakness. Non-outage corrective maintenance back log and EDG reliability were examples of significant strengths. Several areas were considered needing improvement. Reactor trips was an area needing improvement. The goal for Surry is to have two or less unplanned reactor trips per year and, as of May 1993, the units have already had two reactor trips with over half a year in the assessment period remaining. The report did not identify any areas as significant weaknesses.

b. Nuclear Oversight Board

The purpose of the NOB is to provide an independent review and oversight role of nuclear activities at the senior management level. The Board advises the Senior Vice President, Nuclear and the eight members consist of senior nuclear utility executives and consultants. Board review and recommendation results are presented to the Virginia Power President and Chief Executive Officer.

c. Management Safety Review Committee

The MSRC function and activities are specified in TSs. The inspectors reviewed MSRC member qualifications and MSRC meeting minutes for 1992 and 1993. The inspectors concluded that MSRC committee members were well qualified and experienced and that meeting frequencies met TS requirements. IPE flooding and the increase in number of precursors to significant events in 1992 were examples of MSRC concerns. The inspectors verified that MSRC issues were being tracked and properly closed.

d. Corporate Nuclear Safety

CNS is divided into three groups, independent safety review, OER, and independent review. CNS also has general responsibilities that are shared between the three groups. These responsibilities include coordinating involvement with WOG, integrated performance trending, root cause evaluation, and DR/CDE data base.

The primary responsibilities of the CNS independent safety review group are to review events that occur at the station which includes identifying root causes and corrective actions, perform assessments of various station activities, and independently monitor station performance. The inspectors reviewed CNS event

reviews or assessments associated with tagging events, contractor events, shutdown management, and administrative controls of radioactive materials and radiation exposure. The inspectors concluded that these reports were comprehensive in that root causes and corrective actions were identified. In addition, to reviewing the actions associated with a single event, similar types of events are also reviewed in order to identify common or repetitive causes.

The primary responsibility of the CNS OER group is to evaluate industry events for significance and applicability to Virginia Power and recommend action to avoid similar occurrences. Examples of sources of industry events monitored by the CNS OER group are INPO SOERs and Nuclear Network, NRC Information Notices and Generic Letters, and Vendor 10 CFR 21 Notifications. The group also monitors Virginia Power LERs and NRC violations for common applicability and recommends corrective actions. In 1993, the group began to monitor NRC violations issued to other utilities for applicability at Virginia Power stations. During the previous SALP assessment period, a weakness was identified in the area of CNS follow up on corrective action for recommendations from older event reviews. This issue was reviewed during this inspection period and the inspectors concluded that this weakness was corrected in that CNS verified that these corrective actions were completed. During a previous inspection, a weakness was identified in that CNS closure summaries were not being completed with the suggested 90 day program guidelines. This issue was also reviewed during this inspection period and considered corrected in that there were no longer any overdue closure summaries.

The primary responsibility of the CNS independent review group is review SNSOC activities and to manage the Virginia Power 10 CFR 50.59 SE Program which includes reviewing all SEs prepared by the Surry site engineering group. The group has reviewed approximately 450 Surry SEs throughout the current SALP assessment period. Of the 450 SEs the group had written comments on 20 SEs, and 5 SE's were considered inadequate. Four of these five SEs were considered inadequate because they did not properly address contaminated systems and had minor safety significance. The fifth SE identified a potential unreviewed safety question associated with placing a FWRV on its jack. This issue was previously discussed in paragraph 3.c and was identified as a URI. The inspectors noted that SEs associated with placing FWRVs on their jacks were reviewed on four other occasions since 1989 prior to the recent review and did not identify any problems. The inspectors questioned why the potential unreviewed safety question was not identified on the previous reviews and were informed that in the past reviews the most severe events and most bounding analyses in determining the acceptability of this activity were considered. In this case, the most severe event considered, total loss of off site power, did not have the most sever consequences. The inspectors concluded that overall, the CNS independent review

group provided effective independent review of SEs. As a result of the comments generated during the CNS independent review of SEs, the station is in the process of developing a task team to develop methods for improving SEs.

One of the general responsibilities of CNS is to develop quarterly Integrated Trend Reports. The purpose of this report is to assess station issues and events at Surry and North Anna to determine if adverse trends exist and identify any adverse trends to senior management. If adverse trends are identified the report provides recommendations for corrective actions. The inspectors reviewed the Integrated Trend Report dated June 1, 1993. The report identified areas with sustained improving trends and areas with adverse trends. Examples of areas of improved trends were reactivity control, radiation releases, and overall human performance. Example of areas with adverse trends were radiation monitor failures, relay failures, and work practices. The report also identified and trended significant and precursor events. The report indicated that in the first quarter of 1992 the number of significant events associated with plant transients was abnormally high due to two reactor trips that occurred during that period. The inspectors verified that recommendations were tracked until completed. The inspectors concluded that the Integrated Trend Report identified recurring problems through adverse trends, provided in-depth reviews of various problems/events, and provided valid recommendations for corrective action.

e. Nuclear Quality Assurance

TS 6.2.h specifies audits and frequencies that are required to be routinely performed. In 1992, 20 audits were performed and 15 audits are scheduled to be performed in 1993. The inspectors verified that audit open items were being tracked and pursued. The QA audit tracking report listed four open 1991 audit items, 27 open 1992 audit items, and 11 1993 open items. The inspectors reviewed the 1991 items and concluded that audit items corrective actions were effectively implemented.

The QA department routinely performs assessments that are beyond TS requirements. The purpose of these assessments are to evaluate performance in specific areas. Approximately thirty assessments were performed in 1992 and twenty-one assessments have been performed or are in the process of being performed in 1993. Assessments are performed in areas where performance problems or need of enhancement have been identified on recently implemented programs, on followup on previous assessement findings, or on concerns in areas expressed by corporate or station management. Assessment findings are reviewed with station management and are tracked as open items until closed. The QA department also routinely observes maintenance activities at the station. Findings from these observations are documented and discussed with the Superintendent of Maintenance. These observations are also

utilized to trend station performance in the CNS integrated trend report.

Station QA personnel are encouraged to visit counterparts at other nuclear plants to compare programs and identify possible improvements. Corporate and North Anna personnel are utilized to perform Surry audits. Also, Surry personnel are used to perform North Anna audits. Assessments also utilize North Anna and corporate personnel. The department participates in an auditor exchange program with other utilities, participates in a utilities group that independently audit QA programs, and supervisors are required to visit INPO 1 or SALP 1 rated sites on a yearly bases.

f. Management Review Board

The MRB members are the Station Manager, two Assistant Station Managers, and Station QA Manager. The overall function of the board is to overview and coordinate station activities. The inspectors reviewed the 1992 and 1993 MRB meeting minutes. Typical items reviewed at the weekly MRB meetings were temporary modifications, JCOs, and compensatory actions. Other areas reviewed were deferred maintenance items, RCEs, plant equipment problems, plant events, Nuclear Safety Assessments Reports, station assessments, and DR Trend Reports. The MRB also determines the ratings of the quarterly Performance Annunciator Program windows. The MRB has been effective in reviewing station activities.

g. Station Nuclear Safety Operating Committee

TS 6.1.C.1 specifies the requirements for the SNSOC composition, meeting frequency, responsibilities, and authority. Throughout the current SALP assessment period the inspectors have monitored SNSOC performance. The inspectors concluded that TS were met with respect to SNSOC composition, duties, and meeting frequencies. The inspectors observed SNSOC meetings and concluded that the overall, in-depth review of areas important to safety were being performed and that the members were qualified and experienced in diverse disciplines. The SNSOC was especially effective in evaluating proper substitution of manual operating action for automatic actions and ensuring corrective actions prevented specific problem recurrence.

h. Station Nuclear Safety

Tracking and trending DRs is the SNS department's responsibility. The inspectors reviewed the results of the Station Deviation Trend Report for the first quarter of 1993. This report trended the failure mode/mechanism associated with DRs processed from January through March 1993. SNS issues a DR trend reports quarterly. The four major trend categories were human performance, system

performance, component performance and specific equipment performance. The DR trend report identified five recommendations based on the trend results. For example, one recommendation was associated with recurring spiking problems on the ventilation system Kamen radiation monitors. This recommendation included corrective action. Recommendations are assigned CTS numbers that are tracked until closure.

SNS also reviews DRs daily for recurring problems, and if the DR is associated with a recurring problem it is discussed during the morning supervisor meeting. During the previous SALP assessment period, examples were identified where the licensee indicated a willingness to live with several recurring problems. The SNS's review of DRs and DR trending has improved identifying and correcting recurring problems. During this SALP assessement period, recurring problems have been identified, components declared inoperable if applicable, and corrective action initiated. However, in some cases such as control room chillers and station radiation monitors, corrective actions are long term and problems will continue to occur until these long term corrective actions are fully implemented.

Preparing the quarterly Nuclear Safety Assessement Report is another responsibility of the SNS department. The inspectors reviewed the Surry Nuclear Safety Assessment Report for the first quarter of 1993. The report assesses plant performance in the following areas: past and current performance in key safety areas, events that challenge the operator and the plant, significant events and precursors, RCS and SG integrity, and material condition. Key INPO performance indicators are utilized to compare the performance of Surry performance to the industry. The report indicated that the state of nuclear safety in Unit 1 was considered degraded when compared to previous reports. Two reactor trips, safety injections, and forced power reductions contributed to the degraded performance. The state of nuclear safety in Unit 2 was considered high for the period. Three events that occurred in the first quarter of 1993 were considered reductions in the margin of safety. Two events were associated with turbine driven AFW pumps tripping due to degraded steam traps which was previously discussed in NRC Inspection Report Nos. 50-280, 281/93-07. The third event was associated with two main control room chillers being inoperable which was discussed in LER 50-280, 281/93-05.

The inspectors concluded that the multi-tiered programs discussed above collectively incorporate various levels of corporate and station management in ensuring safe operation. The licensee's self-assessment programs are effective in contributing to preventing problems by monitoring and evaluating plant performance and following up on corrective action recommendations.

Within the areas inspected no violations were identified.

6. TS Review Program (40500)

The inspectors assessed the licensee's TS review program results. The licensee implemented this program in September 1992, and the program is scheduled for completion in October 1993. This program reviews TS surveillances and verify that the surveillances were being properly performed.

This review identified examples where components important to safety were not being tested. In most cases TSs did not require testing. It was identified that the circuitry that prevents the RHR inlet MOVs from opening at a high RCS pressure as not being functionally tested. It was also identified that the manual SI actuation logic was not being fully tested. These findings are being tracked by the licensee and will remain open until resolved. The inspectors reviewed the applicable TSs and concluded that these components were not specifically addressed by TSs to require routine testing.

This review has identified the following components that were not being tested as required by TSs:

> TS Table 4.1-1, Item 28 requires that turbine trip inputs to reactor protection be tested prior to each startup. The review identified that the turbine trip signals were tested prior to startup but that the turbine trip signal to the reactor protection system was not being tested prior to startup. The input to reactor protection was being tested on a monthly basis after the units were at power. LER 50-280/93-07 was issued as a result of this finding.
>
> TS Table 4.1-1, Item 32 a, requires a refueling calibration of the steam generator lo-lo level AFW auto start signal. This calibration includes functional testing of the motor and turbine driven AFW pumps. The review identified that the turbine driven auto-start circuit was not being fully tested in Unit 2. When this was identified, a 24 hour LCO was entered in accordance with TS 4.0.3. The testing was completed satisfactorily within the 24-hour period. Addendum 1 to LER 50-280/93-07 is scheduled to be issued as a result of this finding. This testing had been satisfactorily accomplished in Unit 1.

Other less significant procedural errors have been identified and are also being tracked as open items until resolved. The inspectors will continue to monitor this review.

Within the areas inspected no violations were identified.

7. UFSAR Improvement Program (40500)

During the previous SALP assessment period, a weakness was identified in that the UFSAR was not accurate. The inspectors discussed the UFSAR

Improvement Program status with the corporate UFSAR coordinator for Surry. According to the coordinator, review of plant operation described in the UFSAR has been completed and appropriate revisions made, the UFSAR was reviewed and verified that there were no unresolved safety questions, and UFSAR changes have been incorporated such that there is no longer a backlog. The licensee has identified chapter 2, Site Description, as the current priority for review and is in the process of revising the chapter. Chapter 2 is currently scheduled to be completed by April 1994. The licensee currently plans to assign the remaining UFSAR chapters to various Virginia Power organizations for review and revision. Although the program is progressing, a date has not been determined for completing the UFSAR Improvement Program. Within the areas inspected, no violations were identified.

8. Level I Project Tracking (40500)

The Level I Project Tracking Program establishes process for management to track activities critical or essential to the success of the nuclear program. Corrective actions for INPO and NRC SALP deficiencies are examples of items tracked under Level I. The inspectors reviewed the open projects on the Corporate Level I Report dated June 21,1993. The CNS Integrated Trend Report, Maintenance Backlog Monitoring Data, Station Staff Visits to other plants to observe Industry Good Practices, and developing a Leadership Program for first and second line supervisors were examples of corporate Level Is. The inspectors also reviewed the open projects on the Station Level I Report dated June 29, 1993. TS review project, TPUP completion, 1993 INPO preparation, ground water intrusion program, and Post Trip review process were examples of station Level Is. The inspectors concluded that the Level I Corporate and Station Project Tracking Programs demonstrated management's involvement in activities critical to station performance and also provided an additional method for ensuring adequate corrective actions are implemented.

Within the areas inspected, no violations were identified.

9. Licensee Event Review (92700)

The inspectors reviewed the LER listed below and evaluated the adequacy of the corrective action. The inspectors' review also included followup of the licensee's corrective action implementation:

(Closed) LER 280/92-11, Incomplete Low Pressure Carbon Dioxide Fire Protection System Nozzle Testing Due to Procedure Deficiency and Lack of Continuous Fire Watch. TS 4.18.D.1.b.2 requires that operability of the low pressure carbon dioxide fire protection system be demonstrated every 18 months by verifying flow from each nozzle during a puff test. During the performance of a QA Fire Protection audit, it was identified that flow was not being verified at all discharge nozzles. As immediate corrective action, the low pressure carbon dioxide fire protection system was declared inoperable and a continuous fire watch was established in accordance with TS 3.21.B.4. Failure to test the low

pressure carbon dioxide fire protection system per TS 4.18.D.1.b.2 was identified as part 1 to NCV 50-280, 281/93-15-04. This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation met the criteria specified in Section VII.B of the Enforcement Policy. As corrective action, the licensee revised 1-PT-24.3b, Fire Protection Low Pressure Carbon Dioxide System Puff Test, on September 22, 1992, to require that flow from each nozzle be verified. The inspectors reviewed the procedure and verified that the corrective action was implemented. Also as corrective action, the licensee was in the process of performing a TS surveillance review to ensure that they are being properly performed. This review is discussed in paragraph 6.b.

When this condition was identified, a continuous fire watch was stationed per TS 3.21.B.4. During a subsequent fire watch turnover, the fire watch was inadvertently changed from continuous to hourly due to erroneous communication between shifts. When this was identified, a continuous fire watch was reestablished. Failure to establish a continuous fire watch in accordance with TS 3.21.B.4 was identified as part 2 to NCV 50-280, 281/93-15-04. This violation will not be subject to enforcement action because the licensee's efforts in identifying and correcting the violation meet the criteria specified in Section VII.B of the Enforcement Policy. As corrective action, the licensee revised the fire watch assignment sheet to clearly specify continuous or hourly fire watch inspection requirements. The inspectors reviewed the fire watch assignment sheet and verified the corrective action was implemented.

Within the areas inspected, one NCV was identified.

10. Exit Interview

The results were summarized on July 12, 1993, with those individuals identified by an asterisk in Paragraph 1. The following summary of inspection activity was discussed by the inspectors during this exit:

Item Number	Status	Description (Paragraph No.)
URI 50-280, 281/93-15-01	OPEN	Use of PRA for Unreviewed Safety Question Determination (paragraph 3.c).
NCV 50-280/93-15-02	CLOSED	Failure to Perform Minor Maintenance in Accordance With VPAP-2002 (paragraph 4.a).
NCV 50-280, 281/93-15-03	CLOSED	Failure of Personnel to Sequence Tie-in Cleanliness and Fit Up/Tack Inspections in Accordance With VPAP-0903 (paragraph 4.b).

NCV 50-280, 281/93-15-04	CLOSED	Failure to Test Fire Protection System and Failure to Establish a Continuous Fire Watch in Accordance with TSs (paragraph 9).
LER 50-280/92-11	CLOSED	Incomplete Low Pressure Carbon Dioxide Fire Protection System Nozzle Testing Due to Procedure Deficiency and Lack of Continuous Fire Watch (paragraph 9).

Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

11. Index of Acronyms and Initialisms

AFW - AUXILIARY FEEDWATER
AOI - ABNORMAL OPERATING INSTRUCTION
AOT - ALLOWED OUTAGE TIME
BOCA - BUILDING OFFICIALS AND CODE AUTHORITIES
BOP - BALANCE OF PLANT
CAS - CENTRAL ALARM STATION
CDE - CAUSE DETERMINATION EVALUATION
CFR - CODE OF FEDERAL REGULATION
CNS - CORPORATE NUCLEAR SAFETY
CTS - COMMITMENT TRACKING SYSTEM
DR - DEVIATION REPORT
ECCS - EMERGENCY CORE COOLING SYSTEM
EDG - EMERGENCY DIESEL GENERATOR
EP - EMERGENCY PLAN
EPIP - EMERGENCY PLAN IMPLEMENTING PROCEDURES
FWRV - FEEDWATER REGULATION VALVE
I&C - INSTRUMENTATION & CONTROL
INPO - INSTITUTE OF NUCLEAR POWER OPERATION
IPE - INDIVIDUAL PLANT EVALUATION
IRPI - INDIVIDUAL ROD POSITION INDICATION
JCO - JUSTIFICATION FOR CONTINUED OPERATION
LCO - LIMITING CONDITION FOR OPERATION
LEOF - LOCAL EMERGENCY OPERATIONS FACILITY
LER - LICENSEE EVENT REPORT
LOOSP - LOSS OF OFFSITE POWER
MFWP - MAIN FEEDWATER PUMP
MOV - MOTOR OPERATED VALVE
MRB - MANAGEMENT REVIEW BOARD
MSLB - MAIN STEAM LINE BREAK
MSTV - MAIN STEAM TRIP VALVE
MSRC - MANAGEMENT SAFETY REVIEW COMMITTEE
NI - NUCLEAR INSTRUMENTATION
NCV - NON-CITED VIOLATION
NOB - NUCLEAR OVERSIGHT BOARD

NRC	-	NUCLEAR REGULATORY COMMISSION
OER	-	OPERATIONAL EXPERIENCE REVIEW
OSC	-	OPERATIONS SUPPORT CENTER
PRA	-	PROBABILISTIC RISK ASSESSMENT
QA	-	QUALITY ASSURANCE
QC	-	QUALITY CONTROL
QMT	-	QUALITY MAINTENANCE TEAM
RCE	-	ROOT CAUSE EVALUATION
RCP	-	REACTOR COOLANT PUMP
RCS	-	REACTOR COOLANT SYSTEM
RHR	-	RESIDUAL HEAT REMOVAL
RS	-	RECIRCULATION SPRAY
SALP	-	SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE
SAS	-	SECONDARY ALARM STATION
SE	-	SAFETY EVALUATION
SG	-	STEAM GENERATOR
SI	-	SAFETY INJECTION
SNS	-	STATION NUCLEAR SAFETY
SNSOC	-	SURRY NUCLEAR SAFETY AND OPERATING COMMITTEE
SOER	-	SIGNIFICANT OPERATING EVENT REPORT
SW	-	SERVICE WATER
TPUP	-	TECHNICAL PROCEDURES UPGRADE PROGRAM
TS	-	TECHNICAL SPECIFICATION
TSC	-	TECHNICAL SUPPORT CENTER
UFSAR	-	UPDATED FINAL SAFETY ANALYSIS REPORT
URI	-	UNRESOLVED ITEM
VPAP	-	VIRGINIA POWER ADMINISTRATIVE PROCEDURE
WO	-	WORK ORDER
WOG	-	WESTINGHOUSE OWNERS GROUP