



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

Report Nos.: 50-280/88-11 and 50-281/88-11

Licensee: Virginia Electric and Power Company
Richmond, VA 23261

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: March 29 - April 1 and April 11-15, 1988

Inspector: *L. Mellen* 5/24/88
L. Mellen Date Signed

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Quality Assurance Programs Section
Operations Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, announced inspection was in the area of quality assurance effectiveness.

Results: Two violations were identified: Terminating an Unusual Event (UE) and Limiting Condition of Operation (LCO) prior to completing appropriate corrective actions; and Failure to follow Technical Specification (TS) 3-12.C. requirements.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *D. Benson, Station Manager
- *H. Collar, Quality Auditing Supervisor
- *E. Grecheck, Assistant Station Manager
- S. McKay, Plant Engineering Supervisor
- *G. Miller, Licensing Coordinator
- *H. Miller, Assistant Station Manager
- *D. Ogren, Superintendent of Maintenance
- *G. Pannell, Director Safety Evaluation and Control
- *J. Price, Quality Assurance Manager
- *R. Saunders, Manager of Nuclear Programs

Other licensee employees contacted included engineers, technicians, operators, mechanics, security force members, and office personnel.

NRC Resident Inspectors

- B. Holland
- *L. Nicholson

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on April 15, 1988, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

<u>Item Number</u>	<u>Status</u>	<u>Description/ Reference Paragraph</u>
280, 281/88-11-01	Open	Violation - Terminating an UE and LCO prior to completing appropriate corrective action (paragraph 9.d).
280, 281/88-11-02	Open	Violation - Failure to follow TS 3.12.C requirements (paragraph 9.d).

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Quality Verification (TI2515/78)

The objective of this inspection was to assess quality assurance effectiveness. For this report, quality assurance effectiveness is defined as the ability of the licensee to identify, correct, and prevent problems. The term quality assurance effectiveness is used in this application, but it is not meant to be limited to the licensee's Quality Assurance Department. It is the total sum of all efforts to achieve quality results.

This was a performance-based inspection. The principal effort was to determine whether the results that the Quality Assurance program was designed to accomplish were actually achieved. However, when problems were identified, appropriate regulatory requirements were enforced.

The inspection effort was divided into the following areas:

1. Quality Assurance
2. Design Control
3. Maintenance
4. Operations

Each area is addressed separately in this report.

6. Quality Assurance (35701, 40702, 40704)

The effectiveness of the licensee's Quality Assurance (QA) organization was assessed by examining and evaluating audit adequacy, corrective action effectiveness and timeliness, trend analysis, personnel qualifications, and procedures and practices. The licensee's QA organization consists of six supervisors (one administrative) reporting to the QA Manager. Two supervisors oversee auditing and surveillance functions, two oversee Quality Control (QC) inspection activities, and one oversees non-destructive examination (NDE) inspections. The majority of the inspector's effort was concentrated in the auditing and surveillance functions. Some QC functions were also evaluated.

The inspector evaluated the QA department size and experience level as well as seven auditors' qualifications. The organization appeared to be sufficiently structured to encompass the QA functions necessary in evaluating the adequacy of plant activities. Responsibilities and personnel reporting hierarchy were well delineated. The QA Audit group consisted of a Supervisor, a Staff Specialist, two Senior Quality Specialists, and four Quality Specialists, all of whom were certified as lead auditors. Most auditor's technical qualifications had been obtained through industry experience. The inspector noted a lack of degreed auditing personnel in the QA department. Six people in the department; however, are currently working toward degrees. Despite the lack of formal higher education, the

auditor's qualifications appeared to be adequate. An observation [in this area] was identified in that the audit participation requirement for newly certified lead auditors was met by having the auditors participate in short duration, procedure compliance oriented audits. The auditors were certified after participating in the minimum number of audits. This practice could possibly lend itself to certifying lead auditors that may need more audit participation experience before leading audits or performing audits on their own. The inspector reviewed the following audits in the areas of corrective action, maintenance, design control, in-service inspection, and operations.

<u>Audit Number</u>	<u>Title</u>	<u>Report Date</u>
S 86-15	Design Control Program	February 12, 1987
S 86-09	Corrective Actions	May 28, 1987
S 87-08	Corrective Action	August 5, 1987
S-87-22	Mechanical Maintenance and Welding	October 8, 1987
S 87-01	Operations Administration	December 8, 1987
S 87-07	Inservice Inspection	January 13, 1988
S 87-09	Corrective Action	February 23, 1988
S 88-20	Instrumentation Maintenance	March 17, 1988

Two weaknesses were identified in the licensee's auditing program, one of which the licensee had also identified. After reviewing the above audits, it appears that the licensee's audit program utilized procedural compliance verification as the key indicator in assessing department performance during an audit. The licensee acknowledged this concern and in fact, had identified this as a programmatic weakness prior to the inspection. The QA department is in a transitional period in this audit philosophy; however, the more recent audits and findings reviewed were still oriented toward procedural compliance.

The inspector reviewed QA's corrective action verification methodology, which included evaluating corrective action adequacy on audit findings. The inspector identified a weakness in this area, in that audit finding closure is often times based on procedure revisions or, in some cases where procedures are not followed, a reaffirmation by management that procedures will be followed. This practice in itself is not a problem; however, as part of the corrective action process, corrective action implementation must be verified. The inspector identified that there were at least two instances where audit findings were closed without verifying corrective action implementation where the condition identified in the finding still existed after finding closure. Audit finding S87-08-02 dealt with required QA notifications (i.e., audit finding responses, completion dates) not being sent to QA in a timely manner. The station manager issued a memo to cognizant station management stressing the need to meet procedural time frames in response to audit findings. This memo was cited as the basis for closing finding S87-08-02, without verifying effective implementation of this memorandum. This deficiency was not re-evaluated during the next Corrective Action Audit, S87-09.

Additionally, a memo on February 17, 1988, was issued from an auditor to the Auditing Supervisor that states in part: "... We should track the time it takes for QA to receive each response so that this information could be gathered to show Station Management that there is a serious problem with late responses." During audit S87-09, a finding (O2) was written concerning performing work on safety-related systems without the use of approved written procedures. As a result, SUADM-M-16, Operation of the Maintenance Department, was revised and stated that only work determined to be "minor maintenance" could be performed without written procedures, and the audit finding was closed (on April 4, 1988) without verifying implementation. Upon review of QC records on work packages reviewed from March 3, 1987 (date of SUADM-M-16 revision), until April 13, 1987, there were 83 safety-related WOs (Mechanical and Electrical Maintenance) reviewed by QC that had no procedures. The large majority of these WOs were probably completed before the effective date of the procedure revision; however, this was not evaluated by QA prior to closing the audit finding.

This weakness is offset, somewhat, by the fact that QA has in the past formally re-evaluated findings where corrective action implementation was not verified before finding closure. However, in the case of audit finding S87-08-02, corrective action implementation was not initially verified, implementation was not verified on the subsequent audit (S87-09), and based on the internal QA memorandum discussed above, the situation still exists. This situation was discussed with the Station Manager, and the inspector was told that unless QA keeps the audit finding open to verify implementation or re-verifies and writes a new finding, the station's responsibility for corrective action adequacy is complete upon initial finding. This combination of station philosophy and QA methodology on closing audit findings based on procedure revisions or reaffirmation of following procedures without verifying implementation, could allow a deficient condition to exist until possible reverification, if reverification occurs. This allows a situation to exist where the adequacy of steps to prevent recurrence of deficiencies may not be evaluated, in that QA has no formal mechanism by which to ensure this evaluation for all findings. This situation is exacerbated by the fact that revision to NODS-QA-01, Corrective Action, removed stringent requirements for escalation of corrective action response and resolution delays.

The QA department does not have a formalized trending program for corrective action documents; however, there are several seemingly effective informal methods used by QA to evaluate recurring deficient areas. A strength exists in the fact that if a known deficient area is to be audited, QA sometimes utilizes matrices to identify potential weak areas that enables an auditor to concentrate in those areas. The matrices were utilized in Audits S87-07 and S87-09 concerning weakness in the inservice inspection program and in the processing of Nonconformance Report (NCRs). It is a strength of the auditing group that these matrices are utilized, yet a formal trending program would encapture more recurring deficient area. The QA department has realized this and is in the process of implementing a "How To" program for audits as well as trending improvements.

This "How To" program consists of making a reference file for all QA audits which will include, but is not limited to, the following; past audit findings, NRC violations and concerns, surveillance findings, pertinent procedure revisions, and relevant documentation. This should be beneficial to the QA organization not only in implementing a more performance oriented audit program, but will also help identify adverse and positive trends in certain areas and be a helpful indication of performance history for a certain group or department. It appears that one other benefit will be the continued reduction in the excessive time it takes in conducting an audit. The time span has already been reduced from 107 man-days per audit in 1986 to 33 man-days for the four audits conducted in 1988.

Another strength evident in the QA department is the cross training of personnel within the department. Surveillance personnel are certified as auditors and many auditors have also had QC certifications in the past (VT, NDE, etc). This allows QA department needed flexibility in allocating manpower as needed. This enabled the QA department to remain stable with minimum use of contract personnel. Additionally, the department has implemented using system guidelines to familiarize surveillance and inspection personnel with system descriptions, transients associated with the systems, a review of component history, scope of work to be performed during outages, lessons learned, and surveillance scope and activities. These guidelines should be advantageous to any QA personnel monitoring plant activities.

The licensee's QA department appeared to be well organized and implementing improvements in deficient aspects. Considering the direction of this department and its current performance, with the exception of the weakness noted, the effectiveness of the QA department is adequate.

7. Design Control (37702)

The effectiveness of the licensee's QA program in the area of design control was assessed by reviewing design change packages (DCPs), engineering work requests (EWRs), QA audits, and by interviewing cognizant personnel.

Eight DCPs were reviewed to determine the adequacies of documents within the design package. The work requested on each DCP was completed and the design change package closed. All documents required by procedure SUADM-ENG-03, Design Change, were contained in each package reviewed. The technical review and safety analysis (10 CFR 50.59 and CFR 72.35) were provided when required. Each technical review and safety analysis reviewed were adequate.

Each design package reviewed required field changes in order to complete implementation. Several DCPs required greater than 20 field change revisions. DCP-84-53, Dry Cask Independent Spent Fuel Storage Installation, required 49 field changes to complete implementing the DCP. Each

field change was detailed and encompassed changes that resulted from implementing the DCP.

The inspector also reviewed EWRs and temporary modifications to determine the adequacy of the design control program and documentation. The following temporary modifications and EWRs were reviewed:

<u>Temporary Modification</u>	<u>EWRs</u>
2-87-81	85-207
2-88-2	86-162
2-88-3	87-337
2-88-10	87-400
2-88-17	

The documentation reviewed was completed as per plant procedures, SUADM-0-11 (AMD 29.5), Function Bypass and Temporary Modification Controls, and SUADM-ENG-01 (AMD-9), Engineering Work Request. A significant increase in the quality of the technical reviews and safety analysis provided with each temporary modification and EWR was noted for evaluations written after 1986.

The inspector concluded that there has been an increasing trend in the quality of DCPs and the design control program is adequate based on the material reviewed.

8. Maintenance (62700, 62702)

The inspector reviewed the maintenance area to make an overall assessment of the performance of the Operations group. The assessment resulted from direct observation of work activities, personnel interviews, and a reviewing records of past activities.

a. Quality Maintenance Team Program

The inspector examined the use of the Quality Maintenance Team (QMT) program during the 1987 and 1988 time period. Training requirements for the program, as outlined by licensee procedure SUADM-SP-02, ADM-113, "Quality Maintenance Team (QMT)", approved August 27, 1987, were reviewed. The licensee procedure does not state to what extent the program will be implemented; however, the maintenance supervisors interviewed stated that the goal is to have all electricians and mechanics, along with the foremen, qualified to a QMT. At present, all but the newer people have completed training as (QC) inspectors, per ANSI N45.2.6, Qualifications of Inspection, Examination, and Testing Personnel for Nuclear Power Plants. The majority of the personnel have completed training as advanced radiation workers. This training has enhanced the normal training and experience received by maintenance personnel, making them more aware of the requirements and bases for maintenance practices.

Per the licensee procedure, maintenance personnel utilized as QC inspectors must be approved by a QC supervisor and, during the duration of the task, report to the QC supervisor. The inspector interviewed numerous personnel that completed the training and were certified as Level 2 QC inspectors. The inspector concluded that the personnel interviewed had a thorough knowledge of the requirements for reducing problems which arise when both the workers and the inspector report to the same supervisor.

The inspector observed work in process and examined completed work and found that the work was completed in an adequate manner by maintenance department personnel.

The QMT program has effectively increased the knowledge and quality of the maintenance department and is considered a strength.

b. Equipment Tagging

Licensee procedure SUADM-0-13, ADM-29-7, "Operations Department - Operations, Maintenance and Tagging", approved November 23, 1987, outlines the process used to remove equipment from service to protect personnel and plant equipment during maintenance. Following the independent verification conducted by Operations Department personnel, the person directly in charge of the work must perform an in-field verification of the adequacy of the tagout prior to beginning work.

The inspector interviewed personnel in both the Operations and the Maintenance Departments and determined that the personnel were familiar with the purpose and requirements of the equipment tagging program. The maintenance personnel indicated that the maintenance verification does not consist of checking the compliance with the tagging order; it determines and verifies the safety of the condition of the equipment required for the maintenance task.

The inspector reviewed the Deviation Reports (DRs) for the 1987 and 1988 time period and did not identify any evidence of a history of tagging related problems. The equipment tagging program at Surry and its effective implementation is considered a strength in both operations and maintenance.

c. Predictive Maintenance Program

The inspector reviewed predictive maintenance utilization. Predictive maintenance has been incorporated into routinely scheduled equipment surveillances. A notation was present in the Control Room Surveillance Schedule indicating that predictive maintenance was scheduled to be performed concurrently with surveillances.

The Maintenance Engineering Supervisor was interviewed concerning the predictive maintenance program. Predictive maintenance has been included in daily activities on site. The program has successfully increased maintenance activity efficiency. There have been several

instances where predictive maintenance determined that the cause of high pump vibration was coupling misalignment, which prevented the need for pump disassembly for troubleshooting. This effective utilization of the predictive maintenance program is viewed as a strength.

d. Station Nuclear Safety and Operating Committee (SNSOC) Reviews of Procedure Deviations

Licensee Technical Specification 6.4.E requires that temporary changes to procedures receive an approval from the SNSOC within 14 days of the change. A review of station DRs determined that since January 1987 there have been approximately 60 DRs written on late SNSOC reviews of temporary changes to procedures.

The inspector reviewed 35 DRs and determined that each DR contained an average of three procedures which had received a late SNSOC review. Greater than 85 percent of these deviated procedures with late reviews were the responsibility of the maintenance department. The SNSOC identified this problem in meeting 87-335 on December 18, 1987;

"E. Discussion was led by the SNSOC Chairman concerning station deviations as a result of procedure deviations that had a late SNSOC review. This violates Technical Specification 6.4.E. The importance of timeliness in the 14-day review requirement temporary changes to procedures was emphasized. Each member agreed to ensure that this issue would receive additional attention in the upcoming year."

The inspector examined the rate at which the procedures were reviewed late since the problem was identified by the SNSOC and observed that it had not significantly changed. Site management is aware of this problem, and has made appropriate changes which have the potential of correcting the problem. Late procedure reviews are identified as a weakness.

Observations

Interviews conducted with personnel in both the maintenance and the operations departments, revealed that there exists a difference of opinion between the management and the line employees in several areas:

- 1) Second level managers and above consider the communications between themselves and their employees to be one of the main strengths at the site. Conversely, first line management and personnel below these position expressed the consensus opinion that poor communications between line employees and top level management was a major weakness at the site.

- 2) The training department considers the training given on modifications to licensed personnel to be a strength in the training area. The licensed personnel interviewed, both ROs and SROs, consider training received on modifications to be weak, lacking timeliness and accuracy.

These two items are offered as observations which resulted from the opinions received from various personnel interviewed on site.

e. Work Orders

The inspector noted several discrepancies in work order documentation for a small (five) sample of work orders reviewed for installing a vent rig on the charging system. Although the work performed in each of the five cases was essentially identical, the work orders were all documented differently. The following table indicates some of the differences noted:

WO #56144 EQ=yes, Nuclear Safety=no, Class 1E=yes, Tech Spec-3.2, Tagging Required-28 items, tools required - N/A, Drawing Required - 22448FM-88B.

WO #55695 EQ=no, Nuclear Safety=no, Class 1E=no, Tech Spec-N/A, Tagging Required-23 items, tools required-N/A, Drawing Required-N/A

WO #59597 EQ=yes, Nuclear Safety=yes, Class 1E=yes, Tech Spec-N/A, Tagging Required-N/A (OPS Standby), tools required-2, Drawing Required-N/A

WO #56845 EQ=yes, Nuclear Safety=yes, Class 1E=yes, Tech Spec-3.3, Tagging Required-23 items, tools required-3, Drawing Required-11448FM-88B.

WO #57778 EQ=yes, Nuclear Safety=no, Class 1E=yes, Tech Spec-3.2, Tagging Required-2 items, tools required-2, Drawing Required-11448FM-88B.

The inspector interviewed the appropriate Maintenance and Operations personnel and concluded the work had been consistently and correctly performed. Due to the fact the actual work was performed correctly, these are identified as a weakness in the inconsistency and inattention to detail in documenting of work orders.

f. Maintenance Documentation

The inspector reviewed three examples of completed Mechanical Corrective Maintenance procedure, NMP-C-G-227, Horizontal Rotating Equipment Alignment. Each of the completed procedures had errors in the final approved documents. The following are examples of the errors:

Mark Number 1-CH-P-2C dated January 15, 1988, step 3.3 required the entry of the name of the Maintenance Engineer or to N/A the step. Instead, the entry was a procedure number. Steps 5.5.2

through 5.6.2 require an entry of N/A for the opposite shaft but they were left blank. Step 6.2 required the entry of a work request number but it was left blank.

Mark Number 1-CH-P-2A dated November 30, 1987, step 5.7.5 required an entry for #2 Bar sag; this was left blank.

Mark Number 1-CH-P-2C dated November 13, 1987, attachment 1, page 1 of 2, the acceptance criteria given should have been .002. The method of inspection was listed as visual but was actually by dial indication. The final alignment of 1-CH-P-2C was left outside of the correct acceptance criteria.

The above examples are not all inclusive but represent a general lack of attention to detail in the completion of maintenance documentation. Upon discussions with the QC Supervisor, it was noted that several of these discrepancies should have been identified during the QA review and the documents should not have received QA approval. This inattention to detail in maintenance documentation is identified as a weakness.

g. Material Storage

The inspector noted several examples of category 1 materials which required level A and B storage that were left in the laydown area behind the maintenance shop. The licensee reviewed this practice and immediately corrected the deficiencies during the inspection. This is identified as a weakness in the storage of some category 1 materials.

9. Operations

The inspector reviewed the operations area to make an overall assessment of the performance of the operations group. The assessment resulted from direct observations of work activities, personnel interviews, and reviewing records of past activities.

a. Shift Turnover

The inspectors witnessed several shift turnovers. The turnovers were conducted in accordance with appropriate procedures. The thorough, well organized, and professionally conducted shift turnovers were considered a strength in the operational area and contributed to the overall effectiveness of the operations group.

b. Control Room Demeanor

During the direct observation of control room activities, the inspector determined that the professional attitude demonstrated during shift turnover represented the general daily control room demeanor. As in the case of shift turnover, the professional control room demeanor has contributed to the overall effectiveness of the operations group.

c. Post Trip Reviews

The inspector reviewed several post trip reviews. There has been an overall improvement in the review quality, with the most recent reviews delineating appropriate corrective actions and thorough definitive root cause analysis. The improvement in post trips reviews is considered a strength.

d. Inoperable Control Rods Due to Failed Phase Control Cards

At 0102 on March 5, 1988, while operating at 100 percent power, Unit 2 received a control rod urgent failure alarm. The control rod urgent failure resulted from a phase control card failure in the 1BD power cabinet. This failure prevented the normal movement of the B and D control rod banks. At 0302, the licensee began ramping down in power at 60 MWE/HR. At 0307 a Notification of Unusual Event (NOUE), as required by the Surry Power Station Emergency Plan which implements the requirements of 10 CFR 50 Appendix E, was declared due to a reduction in power required by a TS LCO. At 0409, the failed phase control card was replaced and the urgent failure alarm was cleared. The licensee stopped the power reduction ramp. At 0412, the licensee exercised the D control bank. At 0432, the NOUE was terminated. At 0437, the licensee attempted to perform surveillance testing (PT-06) on 1B control bank and received a second control rod urgent failure alarm. At 0445, the second failed phase control card was replaced. At 0530, the D control bank was realigned. At 0548, PT-06 was satisfactory completed on the B control bank.

The licensee terminated the NOUE prior to completing all testing for the circuitry affected by replacing the phase control card. After performing the appropriate tests on the affected circuitry, the B control bank was still inoperable. The card was replaced for a second time, and all subsequent testing performed was satisfactory. In a similar manner the LCO was terminated prior to completing the appropriate corrective action.

This is identified as violation 280, 281/88-11-01, Terminating an UE and LCO when, in fact, the condition still existed.

Additionally, Technical Specification 3.12.C.3 states that if more than one rod assembly in a given bank is out of service because of a single failure external to the individual rod drive mechanism (i.e., programming circuitry), the provisions of Specifications 3.12.C.1 and 3.12.C.2 shall not apply and the reactor may remain critical for a period not to exceed two hours provided immediate attention is directed toward making the necessary repairs. In the event the affected assemblies cannot be returned to service within this specified period, the reactor will be brought to hot shutdown conditions. The unit remained critical for the entire duration of this event (4 hours 46 minutes). The licensee did not comply with the requirements of Technical Specification 3.12.C in that the unit remained critical in excess of the time period. This is identified as violation 280, 281/88-11-02, Failure to Follow Technical Specification 3.12.C Requirements.

e. Logs and Records

The inspector noted a general disregard for the requirements of Administrative Procedure SUADM-0-09, Operations Department - Logs and Records, as it pertained to the required entries in the Control Room Log and the Shift Supervisors Log (Team Supervisors Log). Duplicate log entries were required in both logs; however, log entries frequently appeared in one log but rarely in both as required by SUADM-0-09. Since the events reviewed by the inspector could be reconstructed by using combinations of the existing log entries, the disregard of SUADM-0-09 is identified as a weakness.

f. Conclusions

The documentation of work activities does not reflect the professionalism or quality of the work the inspector observed in the Operations department. With the exception of those items noted above, the Operations department appears adequate.