



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

Report Nos.: 50-280/85-31 and 50-281/85-31

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: September 9 - 13, 1985

Inspectors: *D. Falconer* 10/3/85
 D. Falconer Date Signed

H. Christensen 10/3/85
 H. Christensen Date Signed

Approved by: *B. Debs* 10/1/85
 B. Debs, Acting Section Chief Date Signed
 Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 64 inspector-hours on site in the areas of maintenance programs.

Results: One violation was identified - Violation 280, 281/85-31-06 - Failure to properly document monthly periodic checks on measuring and test equipment (M&TE) SQC-187, WWVB receiver oscillator.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *R. F. Saunders, Station Manager
- *D. Benson, Assistant Station Manager
- H. Miller, Assistant Station Manager
- *E. Grecheck, Superintendent, Technical Services
- *H. Kibler, Supervisor, Planning
- *J. Logan, Plant Licensing
- *R. Mudd, Supervisor, Maintenance Services
- *J. Patrick, Superintendent, Maintenance
- *J. Price, Supervisor, Quality Control
- *J. Wilson, Nuclear Specialist

Other licensee employees contacted included electricians, technicians, mechanics, and office personnel.

NRC Resident Inspectors

- *D. Burke, Senior Resident Inspector
- *M. Davis, Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on September 13, 1985, 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. The following inspector followup items were identified.

Inspector Followup Item 280, 281/85-31-01, Administrative Controls for Changes Affecting the Work Planning and Tracking System (paragraph 5).

Inspector Followup Item 280, 281/85-31-04, Preventive Maintenance Overdue Criterion and Management Review of Overdue Preventive Maintenance (paragraph 7).

Inspector Followup Item 280, 281/85-31-05, Review of Preventive Maintenance Program for Adequate PM Procedures as Recommended by Vendor Manuals (paragraph 7).

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*

Two unresolved items were identified during this inspection; they concern the licensee's quality maintenance team concept. The first concerns the use of team members as quality control inspectors and the second concerns the use of team members to perform radiation surveys and evaluations (paragraph 6).

5. Corrective Maintenance (62700)

The inspectors reviewed the licensee's corrective maintenance program to verify that the program had been established in accordance with regulatory requirements, industry guides and standards, and Technical Specifications. The review consisted of reviewing procedures and numerous maintenance requests, and interviews with various maintenance personnel. Surry's Administrative Procedure (ADM) No. 86, Operation of the Maintenance Department, revision dated February 14, 1985, and the ADM-79 series, Work Planning and Tracking System establishes the method and responsibilities for managing the initiation, planning, scheduling, execution, status tracking, and documentation of maintenance work. The inspectors identified the following concerns:

- ADM-79.5, Work Order Scheduling, requires a monthly audit of all printed work orders to verify accountability. The licensee conducts an audit of all work orders that are completed but not closed-out. A work order receives the "completed but not closed-out" designation when the craft foreman completes his section of the work orders. Subsequent stages of work order routing including post maintenance testing, system restoration, planning department review, engineering review, environmental qualification coordinator review, and quality assurance review are not tracked. The planning department will close-out a work order on the Work Planning and Tracking System (WPTS) computer after the maintenance is done, post testing if required is completed, operation coordinator or shift SRO review and acceptance is completed, and craft coordinator/supervisor has reviewed the package. At present, the computer tracking system does not track the engineering, environmental qualifications and quality assurance reviews. The licensee has identified work order tracking problems and plans have begun for the implementation of new status tracking codes to be added to the WPTS computer. At the present time, post maintenance reviews are not tracked, and there exists a possibility that a completed work package may not receive prompt reviews.

*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

- The inspector reviewed the last nine months of "work completed but not closed-out" audits. These audits indicated that there were a large number of work packages not being closed-out (e.g., 457 packages for August and 320 packages for September). A review of the September audit indicated that approximately 69 work packages have been in the "completed but not closed-out" status for over six months. The licensee informed the inspector that in the past, the audit report had not received much attention, but within the last month management had placed more emphasis on closing-out completed work orders. This is demonstrated by the reduction in the total number of work packages not closed-out for the month of September compared to August. ADM-79.6, Work Order Completion, requires the cognizant department head/coordinator to submit documentation to account for work orders deemed to be lost or unaccounted for by the planning audits, but the procedure has no timeliness requirements for submitting this documentation or for completing work order close-outs and post maintenance reviews.
- The inspectors reviewed Surry's work order backlog. At the time of the inspection, the licensee's backlog consists of 3249 work orders. Of this number, 35 are emergency and 475 are priority ones. The present number of work orders that can be worked for the plant's present mode of operation are 740. Of this number, 309 are in various stages of planning or awaiting material. The licensee has been making steady progress toward reducing the large work order backlog and over the past few months the backlog has been on a decreasing trend.
- During the review of the Work Planning and Tracking System, the inspector noted that the licensee has not established a formal method to ensure revision and updating of the Work Planning and Tracking System to reflect applicable plant procedure, policy or hardware changes. The licensee stated that administrative controls would be established in this area. Pending review of these administrative controls, this item will be identified as an inspector followup item (280, 281/85-31-01).

The inspectors reviewed a select number of completed work order packages to determine if the licensee's procedures were being properly implemented. The following items were noted:

- It was noted that in the section entitled "Describe Work Actually Performed" that the mechanics, electricians and I&C technicians were not documenting maintenance activities to the detail necessary to provide effective feedback for management review, equipment history evaluation, quality assurance audibility, and maintenance activity accountability. The licensee stated that an increased emphasis on maintenance activity documentation would be conveyed to maintenance personnel.

- Emergency Work Order No. 3801012096, Main Feed Pump - 1A Outboard Pump Bearing Over Heating, required the disassembly of the bearing housing to determine the cause of the overheating problem. At the end of the procedure, the feed pump required a post maintenance check out which included pump performance acceptance criteria. The documented performance data did not meet the acceptance criteria specified in the procedure; however, the plant shift supervisor signed-off the step as meeting this criteria. The licensee informed the inspector that the pump was tested under different conditions from the conditions stated for the acceptance criteria in the procedure, and that the data recorded on pump performance were acceptable for the actual test conditions. The inspector expressed concern that the differences in the procedure's acceptance criteria and the results recorded should have been documented as to the reasons for the differences and why the recorded performance data were considered acceptable.
- Emergency Work Order No. 3800022679, Source Range Instrumentation High Voltage Off Problem. A review of this work order indicated that only one section of the performance test procedure was needed and used. The procedure required the use of measurement and test equipment (M&TE), but since only one section of the procedure was used, the technician failed to record the M&TE serial number on the procedure or data sheets. This was considered an isolated occurrence.
- During an audit of orange work request tags placed on plant equipment to indicate maintenance items, the inspector identified the following discrepancies:
 - a. Work Order 129363 was issued on April 12, 1985, and subsequently voided on August 23, 1985; however, the orange tag was still on the component.
 - b. Work order 129907 was issued on February 20, 1985, and maintenance was completed on March 7, 1985; however, the orange tag was still on the component.

Discussions with the licensee revealed that the above deficiencies were indicative of a programmatic problem with the removal of voided or completed work order orange tags. This problem had been previously identified by the licensee and a systematic effort was underway at the time of the inspection to remove all non-active orange tags from plant equipment. Responsibility for the removal of completed and voided work order orange tags has been delineated by the licensee to correct this problem.

6. Quality Maintenance Team

The licensee is in the process of implementing a quality maintenance team concept at the Surry facility. This maintenance concept utilizes a team approach to achieve high quality maintenance work. The mission of the team is to perform all work assigned to the team in a high quality manner without

the involvement of additional support staff in the areas of health physics coverage and quality control inspections.

The responsibilities of the quality maintenance team are as follows:

- Perform examinations or inspections and sign off of quality requirements and QC Hold Points designated in the approved procedures being used for the work assigned to the Quality Maintenance Team.
- Perform radiological control functions to include all monitoring, dose protection, respiratory protection and altered hazard identification as specified by the approved Radiation Work Permit (RWP).
- Accomplish each assigned work order by a process which includes:
 - o Team research of the actual problem
 - o Pre-work briefing in accordance with established briefing forms
 - o Post work review in accordance with established briefing forms
 - o Follow-up action to correct faults or impediments to quality identified in the post work review
 - o Identifying quality problems
 - o Exploring opportunities for becoming more efficient and effective
 - o Being innovative by implementing improved methods, technology and work process
 - o Establishing appropriate monitoring criteria to allow team assessment of progress and feedback to improve the team progress toward Quality Maintenance.

The development of the quality maintenance team concept includes a formal training program which provides instruction in the fundamentals of the team approach, problem solving techniques, quality control training and inspector certification, and advanced radiation worker training. The licensee currently has one mechanical quality maintenance team trained and on-site performing maintenance activities. Preliminary results have been favorable. A second team of electrical maintenance personnel has begun the training and certification process.

The inspectors noted the following concerns regarding the quality maintenance team concept:

- The program provides for certification of team members as QC inspectors and allows the team to conduct their own quality control examinations and inspections including the sign-off of all inspection points and QC hold points. The individual actually performing the inspection must be a team member other than the person performing the work activity or the supervisor directly responsible for the work activity. While performing the QC functions, the team member is under the cognizance of the quality control organization and not under the supervision of the team supervisor. The licensee maintains that this separation of responsibility meets the intent of ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear

Power Plants, to which they are committed. The licensee plans to include the provisions for quality maintenance team members to conduct QC functions in a Quality Assurance (QA) Program Topical Report submittal to the NRC later this year. Pending approval of the QA Topical Submittal, this item will be unresolved (280, 281/85-31-02).

- The program allows quality maintenance team members to perform work without continuous health physics technician coverage in high radiation areas or on equipment or components containing radioactive materials which could cause levels in excess of 100 mr/hr. The advanced radiation worker training received by the team members gives them the skills and knowledge necessary to provide their own health physics monitoring. Health physics technicians are still required to perform the initial surveys and evaluations necessary to develop the radiation work permits to which quality maintenance team members are required to comply with. The licensee maintains that this division of radiation survey responsibilities relieves quality maintenance team members from the training and experience requirements for technicians contained in Section 4.5.2 of ANSI/ANS-3.1, Qualification and Training of Nuclear Power Plant Personnel, to which the licensee has committed. Pending a detailed review of the utilization of quality maintenance team members to provide radiation surveys and evaluations, by the NRC Region II Facilities Radiation Protection Section, this item will be identified as unresolved (280, 281/85-31-03).

7. Preventive Maintenance Program (PM)

The PM program at Surry is implemented by two procedures, ADM-100, Planned Maintenance System Manual, and ADM-110, Instrument Department Preventive Maintenance Program. The inspector conducted a review of these procedures and a select number of PM records to verify implementation of the program. The inspector noted the following:

- Mechanical and electrical craft PMs are under the guidance of ADM-100 and the Instrument Department PMs are implemented by ADM-110. The mechanical and electrical PM master schedule is a yearly schedule developed from a PM index. This index lists all PMs in the maintenance department and the required performance frequency. The yearly schedule is used to schedule monthly PMs and to track the completion of these PMs. ADM-110 is used by the instrument department to list all pertinent instrumentation procedures that are part of the PM program. These procedures include, periodic test, calibration and instrument maintenance procedures, refueling master work lists and the eighteen month calibration checklist. Each procedure lists what equipment it covers and what performance schedule it will follow.
- A review of the maintenance department's yearly schedule indicates that for the month of August, 14 PMs were not completed out of a total of 50 scheduled for that month. The PM planner informed the inspector that a PM is considered delinquent if it exceeds the scheduled frequency by 25 percent (i.e., if a monthly PM is overdue by a week or an annual PM is

overdue by three months). This delinquent criterion is not proceduralized. Additionally, there is no requirement for management review of incompleting PM activities. The lack of an overdue criterion and management review will be an inspector followup item pending establishment of administrative controls in this area (IFI 280, 281/85-31-04).

- Selected preventive maintenance procedures were reviewed. In general, the PM procedures were cryptic in the degree of instruction provided; however, they did appear to provide adequate guidance for the performance of the stated objectives.
- A review of instrument calibration records for Unit 1, Steam Flow Loop 3, (F-1-495), Unit 1 Narrow Range Steam Generator #1 (L-1-474) and cold loop one isolation valve temperature interlock (T-1-410) indicated that these instruments are included in the instrument department PM program. Their calibration history was kept up to date, the calibration was traceable to a nationally recognized standard, and approved procedures were used for their calibration.
- A review of the equipment history available on the containment instrument air system indicates that a chronic maintenance problem has existed on this system. Extensive corrective maintenance has been performed on the compressor and dryer units to repair various problems. In response to the high expenditure of corrective maintenance effort on the instrument air system, the licensee has requested vendor assistance in improving the reliability of the system.

Quality Assurance Audit 84-21 identified weaknesses in the overall preventive maintenance program and led to recent improvements in the preventive maintenance of the instrument air systems. During a review of the preventive maintenance program on the instrument air systems, the inspector noted that the licensee had not provided effective preventive maintenance on the containment instrument air system in the past. This appears to be a contributor to the chronic nature of the corrective maintenance necessary on this system. A review of the current preventive maintenance program which incorporates the corrective actions identified in response to the QA audit findings, indicates that the licensee has incorporated the majority of the vendor recommended periodic maintenance checks; however, these maintenance checks are not, in all cases, required at the vendor's recommended frequencies. In addition, the FSAR states that "Air exiting the dryer will have a dewpoint of +35°F," and furthermore that "The instrument air dewpoint has been selected to be below the lowest indoor temperature expected (50°F) at the station location." The licensee's program does not provide a check to verify the design basis dewpoint of the instrument air system.

The licensee stated that the above concerns would be evaluated to determine necessary modification of the preventive maintenance program. This item will be identified as an inspector followup item pending review during a subsequent inspection (280, 281/85-31-05).

8. Measuring and Test Equipment (M&TE)

ADM-84, Control of Measuring and Test Equipment, and ADM-84.1, Calibration of Test Equipment, are the implementing procedures for Surry's M&TE program. The inspector conducted a review of selected M&TE records to verify equipment calibration history, traceability to nationally recognized standards, and proper equipment identification and labelling of M&TE with calibration status. The inspector noted the following:

- The M&TE calibration history is documented in two places. The first is the calibration lab instrument history sheet. The sheet is also used as a cycle tracking tool. The instrument calibration technician will pull this sheet from the month calibration file and perform the required calibration. The calibration is documented on this sheet, then the sheet is placed in the calibration file under the month it is next due. The second place the equipment calibration history is maintained is on the test equipment history card, which is located in a file box. Both methods maintain a documented calibration history of the test equipment.
- The traceability of the test equipment to a national standard is documented on the calibration lab instrument history sheet. This sheet has a section provided that allows the technician to document which test standard was used in calibrating the test equipment.
- All M&TE have an identification serial number attached to the equipment. Additionally, when the equipment is calibrated, a label is attached to it, so that the user can determine if the equipment is overdue for calibration.

During a review of M&TE calibration history and its traceability to national standards the inspector determined that Surry's test standard, SQC-187, WWVB Receiver Oscillator, a time-frequency standard, which is used to calibrate M&TE that is used on safety-related components and equipment, had no documentation of calibration history. WWVB receiver oscillator, SQC-187, test and measuring equipment form 888.89 documents that the receiver is self calibrating but has monthly routine checks according to the manufacturer. A review of the test equipment history card and a check for the calibration due date sticker indicated that no information was recorded on the last instrument check or when the next check was due.

The WWVB receiver technical manual states that, for those users concerned about formal establishment of calibration traceability, the following monthly checks will be sufficient, especially if formally recorded in a log book. These checks are:

- a. Check to see that the green lock light is lit on the front panel of the receiver. This establishes that the receiver is phase locked to a 60 KHz signal being received via the antenna.
- b. Check to see that the hourly offset of approximately 2.1 microseconds is occurring at 10 minutes after each hour, returning to normal at 15 minutes after the hour. These offsets occur due to the 45° phase shift that is applied to the signal at the transmitter at 10 minutes after the hour, returning to normal 15 minutes after the hour. The presence of those offsets both identifies the station and gives hourly "time ticks" on a chart recorder trace of the phase comparator output. Their presence indicates that the chart recorder line can be coming only from the National Bureau of Standards.
- c. Move the front panel meter switch to the "lock voltage" position, and observe that the reading is at or near center scale. If this reading is reaching the outer boundaries of the middle one-third of the scale when the green lock light is on, a trimmer adjustment should be made on the A2 circuit board in the receiver to recenter the meter reading. To obtain a center scale reading, first verify that the green lock light is lit due to an antenna signal, then adjust A2C10 to obtain a center scale reading. This is a very touchy adjustment, and must be made very slowly in extremely small increments. The long time constant in the phase locked loop will prevent the meter reading from changing rapidly, and at least 30 seconds must be allowed between adjustments for the phase locked loop to settle down. This adjustment compensates for the longer-term aging of 10 MHz crystal A2Y1 which is phase locked to the WWVB carrier frequency. In a properly functioning receiver, this adjustment should not need to be made more often than every six months.

The instrument calibration technician informed the inspector that the above checks are performed monthly, but that they have not been documented.

ADM-84, Control of Measuring and Test Equipment, dated May 17, 1985, Section 4.3, states in part, that each supervisor responsible for one or more of the devices in the M&TE calibration program shall: be responsible for ensuring that the devices under his control are calibrated at the frequency established on the test and measuring equipment form. Additionally, Section 4.4, states in part, that the Instrument Supervisor or the supervisor of the individual performing the calibration shall maintain a maintenance history record for each device in the M&TE Calibration Program that is under the direct administrative control of the power station. This history record shall contain, among other information, the calibration date, the next calibration due date and whether the device required adjustment. This information is necessary to determine the adequacy of the calibration frequency assigned to that device.

Surry Technical Specification 6.4.A.2 and D, states in part, that detailed written procedures with appropriate check-off lists and instructions shall be provided for the following conditions: calibration and testing of instruments, components, and systems involving nuclear safety of the station. All procedures described in A and B above shall be followed.

The inspector informed the licensee that lack of proper documentation of the monthly WWVB receiver checks was a violation (280, 281/85-31-06).