

Evaluation  
Report

December 1981

Surry  
Power Station  
Virginia Electric and  
Power Company

11100

**EVALUATION**  
**of**  
**SURRY POWER STATION**

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Virginia Electric and Power Company

December 1981

## SUMMARY

### INTRODUCTION

The Institute of Nuclear Power Operations (INPO) conducted its first evaluation of Virginia Electric and Power Company's (VEPCO) Surry Power Station during the weeks of October 5 and 12, 1981. Surry consists of two 775 Mw net Westinghouse pressurized water reactors. The station is located on the south bank of the James River on a point of land called Gravel Neck in Surry County, Virginia. Unit 1 began commercial operation in 1972. Unit 2 began commercial operation in 1973.

### PURPOSE AND SCOPE

INPO conducted an evaluation of site activities to make an overall determination of plant safety, to evaluate management systems and controls, and to identify areas needing improvement. Information was assembled from discussions, interviews, observations, and reviews of documentation.

The INPO evaluation team examined station training, operations, maintenance, radiological and chemistry activities, on-site technical support, and organization and administration. The team also observed the actual performance of selected evolutions and surveillance testing. Corporate activities were not included in the scope of the evaluation, except as an incidental part of the station evaluation. As a basis for the evaluation, INPO used performance objectives and criteria relevant to each of the six areas examined; these were applied and evaluated in light of both the experience of team members and INPO's observations of good practices within the industry.

INPO's goal is to assist member utilities in achieving the highest standards of excellence in all phases of nuclear plant operation. Accordingly, the conditions found in each area were compared to best practices, rather than to minimum acceptable conditions or requirements.

### DETERMINATION

Within the scope of this evaluation, the team determined that the station is being operated in a safe manner by qualified personnel.

Certain beneficial practices and accomplishments were noted:

VEPCO has provided a plant-specific control room simulator at the site. The simulator is used effectively to train plant personnel and to test plant procedures.

The secondary chemistry program is particularly effective.

Operations Training Bulletins and synopsis reports of industry operating experiences prepared by the Safety Engineering Staff are used effectively to keep plant personnel informed of current safety and reliability issues.

Selection standards for entry-level operators are high. Operators are enthusiastic.

Assignment of an Operations Maintenance Coordinator and an engineering technician in the Operations Department has significantly reduced the administrative burden on the Operations Superintendent and the shift supervisors.

Improvements were recommended in a number of areas. The following are considered to be among the most important:

The plant material condition should be improved. A number of actions and increased management emphasis will be required.

Increased attention is needed to properly identify and resolve abnormal indications and conditions.

An effective non-licensed operator training program should be implemented to ensure proper qualification prior to assignment to shift responsibilities.

Improved methods are needed to ensure operator awareness of plant status.

Action should be taken to reduce liquid and solid radiological waste volumes.

Increased management emphasis is needed to improve radiological control practices.

In each of the six areas evaluated, INPO has established PERFORMANCE OBJECTIVES and supporting criteria. All PERFORMANCE OBJECTIVES reviewed during the course of this evaluation are listed in the APPENDIX.

Findings and recommendations are listed under the PERFORMANCE OBJECTIVES to which they pertain. Particularly noteworthy conditions that contribute to meeting PERFORMANCE OBJECTIVES are identified as Good Practices. Other findings describe conditions that detract from meeting the PERFORMANCE OBJECTIVES. It would not be productive to list as Good Practices those things that are commonly done in the industry since this would be of no benefit to VEPCO or to INPO's other member utilities. As a result, most of the findings highlight conditions that need improvement.

The recommendations following each finding are intended to assist VEPCO in ongoing efforts to improve all aspects of its nuclear programs. In addressing these findings and recommendations VEPCO should, in addition to correcting or improving specific conditions, pursue underlying causes and issues.

The findings listed herein were presented to VEPCO management at an exit meeting at the station on October 15, 1981. Findings, recommendations, and responses were reviewed with VEPCO management on November 17, 1981. VEPCO's responses are considered satisfactory.

To follow the timely completion of the improvements included in the responses, INPO requests written notification of status six months from the date of this report.

The evaluation staff appreciates the excellent cooperation received from all levels of Virginia Electric and Power Company.

E. P. Wilkinson  
President

**VIRGINIA ELECTRIC AND POWER COMPANY**

## Response Summary

The INPO evaluation of Surry Power Station is one of several industrywide appraisals designed to improve the operation of commercial nuclear power stations beyond established regulatory requirements.

Veeco fully supports this industry effort and the progressive criteria used to make the evaluation.

While the results of this evaluation showed that some areas at the station need improvement, INPO determined that Surry "is being operated in a safe manner by qualified personnel."

The INPO findings and improvement recommendations provided insights that will aid Veeco in improving overall operations of Surry and North Anna.

Veeco has taken a number of actions to improve the Surry plant material condition. Additional attention will be focused on this area, including a program of periodic plant inspections involving management and supervisory personnel. Individuals have been assigned specific areas of the station to monitor for housekeeping.

Proper attention to identification and resolution of abnormal indications and operating conditions will receive increased emphasis during shift operations and in training sessions. Weekly meetings are being conducted with supervisors in the Operations Department to discuss abnormal conditions that have been observed or detected at the station. A method has been established to deal with nuisance alarms. Tours and observations of plant operational activities will be used by management to ensure that the necessary improvements are achieved.

An effective training program will be implemented in 1982 to ensure proper qualification of non-licensed operators. Veeco has recently completed an extensive task analysis which will provide valuable input into this training program.

Veeco will be developing improved methods to ensure operator awareness of plant status. These methods will include improvement in turnover procedures and procedures for control of posted operating aids. Additionally, in the longer term, Veeco intends to perform a review of the control room design to identify needed human factors improvements.

The program of periodic plant inspections involving management and supervisory personnel will, as a part of the effort, monitor for liquid leaks that could increase the radioactive liquid waste volume. Additionally, a consultant was recently selected to evaluate Veeco's solid radioactive waste practices and recommend improvements. It should be noted that the recent steam generator replacement effort generated quantities of waste not normally associated with routine operation of the station.

A new exposure management system, when implemented in 1982, will provide a tool for supervisory personnel to improve radiological control practices. General Employee Training will be reviewed and enhanced to improve understanding of radiological controls. A number of actions will be taken to improve individual radiological control practices.

Veeco looks forward to the INPO evaluation of both of its nuclear stations in 1982.

TRAINING AND QUALIFICATION

## TRAINING FACILITIES AND EQUIPMENT

**PERFORMANCE OBJECTIVE:** Provide the training facilities, equipment, and materials for development and evaluation of knowledge and skills needed by nuclear plant personnel.

**Finding**  
(TQ.3-1)

The following Good Practice was noted: The on-site control room simulator is used to evaluate plant procedures prior to implementation.

## NON-LICENSED OPERATOR TRAINING

**PERFORMANCE OBJECTIVE:** Develop and maintain the skills and knowledge necessary for non-licensed operators to perform their assigned job functions.

**Finding**  
(TQ.4-1)

Training improvements are needed to ensure that non-licensed operators acquire the knowledge and skills necessary to perform their responsibilities effectively. Although qualification checkoff sheets are provided to guide and document achievement of skills, appropriate standards for completion of the individual requirements are not available, and the checkoff sheets do not include all appropriate requirements. A number of non-licensed operators have been assigned shift responsibilities before adequately demonstrating their ability. It is understood that extensive improvements to the non-licensed operator training program, including classroom instruction, were being planned.

**Recommendation**

Establish and implement an improved non-licensed operator training and retraining program. Include instruction and examination, as appropriate, on all of the knowledge and skills necessary for operators to perform their duties effectively. Improve the qualification checkoff system by establishing appropriate standards for the completion of each item. The INPO publication "Nuclear Power Plant Non-Licensed Operators - Guidelines for Qualification Programs" (GPG-04) should be used as a basis for determining program requirements.

**Response**

An extensive task analysis project for non-licensed operator training has been completed. Non-licensed training is now being restructured to accomplish the recommendations of the task analysis. It is management's goal to implement the restructured training program by May 1, 1982. In addition, a program of initial classroom training for non-licensed operators based on the recent

task analysis is currently under development and will be implemented in 1982. It is management's goal that all personnel entering the operator training program in the future will be graduates of the Memphis State Nuclear Skill Program or have prior experience. VEPCO is conducting a scholarship program to place outstanding high school graduates in the Memphis State program. Commencing in January 1982, an ongoing non-licensed operator classroom training curriculum is being implemented in conjunction with the licensed training schedule. Development of amplified qualification standards for the non-licensed qualification checkoff sheets is underway. These standards will be written and implemented by the end of 1982.

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### LICENSED OPERATOR REQUALIFICATION TRAINING

**PERFORMANCE OBJECTIVE:** Maintain the skills and knowledge necessary for licensed operators to perform their assigned job functions.

**Finding**  
(TQ.6-1)

Improved provisions are needed for retraining licensed operators with significant knowledge and skill deficiencies. Some operators who achieved below standard grades on requalification program examinations received no remedial training for several months. Discussions with and observations of a number of operators revealed weaknesses in understanding plant limits and operating practices.

**Recommendation**

The knowledge and on-the-job performance of licensed operators should be measured against job-related standards periodically. The requalification training program should be modified to ensure that timely remedial training is conducted whenever deficiencies or weaknesses are apparent. Provisions should be established for removing operators from shift duties if significant operational weaknesses are identified at any time during the requalification cycle.

**Response**

It is recognized that timely administration of remedial training in areas of weakness is important. Training Administrative Procedures are being developed to enforce the current policy providing accelerated retraining in a timely manner when deficiencies or weaknesses are apparent at any time during the requalification cycle. The procedures will also include provisions for removing operators from licensed duties whenever significant operational weaknesses are identified. They will be completed by April 30, 1982.

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**SHIFT TECHNICAL ADVISOR TRAINING**

**PERFORMANCE OBJECTIVE:** Develop and maintain the skills and knowledge necessary for Shift Technical Advisors (STA) to perform their assigned job functions.

**Finding  
(TQ.7-1)**

The Shift Technical Advisor (STA) training program needs improvement to enable STAs to make a more meaningful contribution to safe shift operations. STAs were not actively involved in surveillance of integrated plant operations during the evaluation. Lack of routine involvement in integrated plant maneuvers can detract from their ability to provide meaningful guidance to shift operations personnel during transients.

**Recommendation**

Modify the current STA training program to more strongly emphasize routine involvement in plant operations, particularly transients. Develop and implement techniques for evaluating the ability of each STA to contribute effectively to safe operation during transients.

**Response**

An STA training program modification has been developed to place stronger emphasis on involvement in routine plant operations and transients. It will include direct STA participation in simulator training activities. The modified program will be in place by January 30, 1982.

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**MAINTENANCE PERSONNEL TRAINING**

**PERFORMANCE OBJECTIVE:** Develop and maintain the skills and knowledge necessary for maintenance personnel to perform their assigned job functions.

**Finding  
(TQ.8-1)**

The qualification and requalification programs for mechanical and electrical maintenance personnel need to be expanded to provide more training in basic skills, plant systems, and work practices. It is understood that the step training program is being revised to address these concerns.

**Recommendation**

Expand mechanical and electrical maintenance training programs to include plant systems and nuclear plant work practices. The INPO "Guidelines for Mechanical Maintenance Personnel Qualification" (GPG-05) and "Guidelines for Electrical Maintenance Personnel Qualification" (GPG-07) should be used as a basis for determining program requirements.

**Response**

A formal classroom training/retraining program will be developed and implemented in 1982 for mechanical and electrical maintenance personnel. The training staff will be increased to provide more emphasis on mechanical and electrical maintenance training. An instructor for electrical maintenance training has been selected and is on staff. An effort is underway to acquire an instructor for mechanical maintenance training.

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## OPERATIONS

### OPERATIONS ORGANIZATION AND ADMINISTRATION

**PERFORMANCE OBJECTIVE:** Provide a clearly defined operations organization that is adequately staffed, assigns responsibilities, and delegates adequate authority for the accomplishment of required tasks.

**Finding  
(OP.1-1)**

The following Good Practice was noted: The administrative burden on the Operations Superintendent and shift supervisors has been reduced by assigning routine administrative duties, including processing of work requests, to an engineering technician and an Operations Maintenance Coordinator.

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### OPERATIONS FACILITIES AND EQUIPMENT

**PERFORMANCE OBJECTIVE:** Provide plant facilities and equipment that are operated and maintained at a level to support safe and efficient operation.

**Finding  
(OP.2-1)**

Plant valves, components, and systems are not clearly identified by permanent, distinguishable, and consistent labeling in some areas of the plant.

**Recommendation**

Increase emphasis on the labeling of important valves and components, and expand the existing labeling program to include the permanent marking of piping and equipment throughout the plant.

**Response**

It is recognized that valves, components, and systems require clear, identifiable labeling for effective operation. Valve lineup methods have been modified to ensure that labeling deficiencies are identified during valve lineups. Plant walkdowns by non-licensed operators and trainees will also be used to ensure that equipment and piping labeling deficiencies are identified. Operations work lists will be developed to ensure that needed labels are installed in a timely manner. The initial, comprehensive walkdown of Unit 2 has been completed. The walkdown of Unit 1 will be completed during the 1982 refueling outage. The program will then be continued on a routine basis to ensure ongoing correction of labeling deficiencies.

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**Finding**  
(OP.2-2) **Control room annunciators are difficult to read when viewed from the operator's normal station.** The small illuminated lettering on a black background is particularly difficult to read if one of the two illuminating bulbs is out.

**Recommendation** Implement planned modifications to improve annunciator readability.

**Response** Possible modifications to the annunciator panels are under consideration as a part of the control room design review. Pending completion of this review, a program to clean annunciator windows periodically and verify proper illumination of all annunciators has been implemented.

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### CONDUCT OF SHIFT OPERATIONS

**PERFORMANCE OBJECTIVE:** Ensure that shift operations are conducted in a safe and reliable manner.

**Finding**  
(OP.3-1) **Action is needed to reduce the number of control room annunciators that are normally in an alarmed condition and to reduce the incidence of nuisance alarms.** Operators were often distracted by rapidly repeated audible alarms, particularly in cases where the monitored parameter was at or near the alarm point.

**Recommendation** Implement an aggressive program to reduce the number of annunciators that are normally in an alarm condition during power operation. Reduce or eliminate the distraction of operators caused by repeated actuation of nuisance alarms. Consideration should be given to design changes that permit temporary silencing of the audible alarm for individual annunciators.

**Response** It is recognized that the nuisance alarms are distracting to the operator. Elimination of nuisance audible alarms will be addressed in the control room design review. In the interim, an administrative means for silencing nuisance alarms, with authorization of the shift supervisor, has been established. Documentation of temporary silencing is in the Jumper Log.

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**Finding (OP.3-2)**      **Operating and management personnel need to be more responsive to early signs of abnormal conditions. Increased efforts are needed to ensure that timely and effective corrective actions are completed.** Personnel were sometimes complacent about reporting and pursuing the causes of abnormal indications. More aggressive management attention to correction of reported deficiencies is needed.

**Recommendation**      **Aggressively pursue investigative action for plant abnormalities and take prompt corrective action where necessary. Emphasize the importance of believing instrumentation until objective evidence is available to the contrary.**

**Response**      The value of an aggressive program to investigate plant abnormalities and take prompt corrective action where necessary is recognized. This policy has been emphasized by management and is being implemented in weekly meetings conducted with all supervisors in the Operations Department. Other departmental representatives also attend for discussion of problems in their areas. These meetings provide a forum for discussing abnormal conditions and establishing priorities for resolution. During operator requalification training and while on shift, greater emphasis will be placed on the importance of shift personnel believing abnormal indications and pursuing their correction.

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**Finding (OP.3-3)**      **The following Good Practice was noted: The Operations Training Bulletins are an excellent means of disseminating safety- and reliability-related information to shift personnel.** These bulletins include synopses of pertinent Significant Operating Event Reports, explanations of design changes, and the bases for procedure changes.

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#### PLANT OPERATIONS PROCEDURES

**PERFORMANCE OBJECTIVE: Provide timely, effective guidance to operators in the form of written procedures.**

**Finding (OP.4-1)**      **Administrative procedures for incorporating temporary changes into existing operating procedures need to be developed.** Presently, when a procedure deviation is approved, no record of this deviation is retained with the working copies of the procedure.

**Recommendation** Implement administrative procedures to ensure that working copies of procedures are kept current until permanent revisions are issued.

**Response** Procedures will be revised when a Procedure Deviation indicates a permanent change is required before the procedure is used again. For frequently used procedures, copies of the Procedure Deviation will be attached to the storage supply of procedures, and the change request to correct the procedure deficiency will be expedited. These improved controls will be in effect by February 1, 1982.

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**Finding (OP.4-2)** **Emergency procedures are not uniquely and readily identified to allow rapid retrieval by the operator in emergency situations.**

**Recommendation** Provide a method for assisting operators in rapid location of individual emergency procedures.

**Response** Emergency procedures have been identified with conspicuous tabs to aid in ready access.

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**Finding (OP.4-3)** **Increased management emphasis on procedural compliance is needed.** Steps of some plant procedures were signed off as being satisfactorily completed although out-of-specification or abnormal conditions existed.

**Recommendation** Management should address the need for procedural compliance with all operating personnel. Abnormal conditions noted during the performance of procedures should be promptly reported to appropriate supervisors.

**Response** A procedure exists for notifying appropriate supervisors should out-of-specification readings be logged or should the situation arise where a step in a procedure cannot be completed as written. The need for prompt reporting and documentation has been emphasized to all operating personnel and will continue to receive increased management attention to ensure that appropriate procedure adherence is achieved.

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## PLANT STATUS CONTROLS

**PERFORMANCE OBJECTIVE:** Maintain plant status in a condition that ensures equipment and system availability as necessary for safe and reliable plant operations at all times.

**Finding (OP.5-1)** The methods for maintaining the status of non-safety-related equipment are informal and do not ensure that comprehensive plant status is communicated from one shift to another.

**Recommendation** Implement improved methods for maintaining the status of balance-of-plant equipment.

**Response** A task group has been assigned the responsibility to prepare a program to ensure that up-to-date status information for important plant equipment is available to operations personnel. The program will be developed and implemented by February 1, 1982.

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**Finding (OP.5-2)** Communications between control room operators and personnel performing testing and troubleshooting in the plant need improvement. Operators often employed repeated paging to obtain information on abnormal conditions or unexpected alarms associated with maintenance or testing.

**Recommendation** Provide guidance for operators in the use of more efficient communications techniques.

**Response** Reliable communications are available in the form of "Gai-tronics," radios, and sound power phones. Ongoing guidance will be provided to improve communications among plant personnel, particularly when dealing with abnormal conditions or unexpected alarms.

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**Finding (OP.5-3)** Inspection and testing of equipment following maintenance needs to be expanded to include important balance-of-plant equipment. Only safety-related equipment is currently required to be operationally tested or inspected following maintenance.

**Recommendation** Establish controls to ensure that all plant equipment is checked for operability before being returned to normal service after maintenance. The checks should include such items as a visual inspection

to determine that the equipment is properly assembled, visual checks of lubricant levels, lineup of associated valves and switches, and observation when first energized, as appropriate. For more important equipment, operational tests should be considered.

**Response**

Procedures for returning equipment to service will be reviewed and revised as necessary to include the appropriate checks stated in the recommendation. The improved procedures will be in effect by June 1, 1982.

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**Finding  
(OP.5-4)**

**Notes, portions of procedures, and drawings of a temporary nature are attached to control panels at various plant locations and used as operator aids.** No method is in use for updating, verifying, or reviewing these temporary messages for continued applicability.

**Recommendation**

Implement the proposed administrative procedure for written instructions and aids used by operations personnel. Include requirements for periodic reviews to keep instructions and notes current.

**Response**

Standing Order #12 guides the placement of notes in the control room. This administrative control will be expanded to include all temporary aids to the operators and to require periodic review of all posted aids. The expanded controls will be in effect by March 1, 1982.

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**SHIFT TURNOVER**

**PERFORMANCE OBJECTIVE:** Ensure a continuous and correct understanding of plant conditions at all shift operating positions through proper shift turnover.

**Finding  
(OP.6-1)**

**Shift turnover procedures need improvement.** Review of items such as defeated alarms, tagged-out equipment, and testing of annunciators and status lights should be conducted by appropriate personnel during the turnover process.

**Recommendation**

Expand existing turnover requirements to include reviews of all pertinent information for each shift position. Develop or expand checksheets as appropriate to help ensure thorough turnovers at each shift position.

**Response** Existing turnover procedures and requirements will be reviewed and revised to ensure thorough turnovers at each shift position. Improved procedures will be in effect by April 1, 1982.

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### TAGOUT PRACTICES

**PERFORMANCE OBJECTIVE:** Protect personnel and plant equipment by implementing effective tagout practices.

**Finding**  
(OP.7-1) **Independent position verification is needed for important or safety-related equipment that is repositioned following maintenance or testing.**

**Recommendation** Revise procedures to require an independent verification of the position of important or safety-related equipment that is repositioned following maintenance or testing.

**Response** Pumps and remotely operated valves of safety-related equipment are formally tested upon return to service following maintenance or testing. Manual valves that are realigned as part of testing are verified to be in their proper position by two people. The manual valves that directly affect or could directly affect safety systems are independently checked weekly. By February 1, 1982, improved controls will be implemented so that repositioning of manual valves following maintenance will be approved by a senior reactor operator (SRO), and those valves that affect system operation will be independently verified to be in the correct position.

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**Finding**  
(OP.7-2) **The training and qualification of persons assigned to perform system lineups and post tags need to be upgraded. Some of these personnel have not received formal system training or completed system qualification.**

**Recommendation** Implement controls to ensure that tagging of equipment and valve lineups are performed by operators who have received appropriate training on the system to be tagged.

**Response** Tagging of equipment is presently reviewed by an SRO before the system/component is removed from service. Operators undergo training on tag placement as part of their initial training. The front-end operator training program, which will be in effect approximately May 1, 1982, will provide them with appropriate

plant-system knowledge. Operators who perform valve lineups have now achieved the necessary basic understanding of the systems they line up.

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**Finding**  
(OP.7-3)

**The current review of active tagouts needs to be expanded to include a periodic formal audit of outstanding tags.**

**Recommendation**

Establish a system to periodically audit all active tagouts to ensure that tags are posted as desired and that tagged equipment is properly positioned. Establish a tagout index to track and aid in reviewing the status of active tagouts.

**Response**

A task team has been assigned responsibility to review the tagging system. A revised program, including periodic audit of physical tag placement and an index to allow for easy review by oncoming shift personnel, will be in effect by May 1, 1982.

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MAINTENANCE**MAINTENANCE FACILITIES AND EQUIPMENT**

**PERFORMANCE OBJECTIVE:** Support the performance of maintenance activities by providing adequate facilities and equipment.

**Finding**  
(MA.2-1)

The condition of the plant reflects a need for substantially increased management attention to the identification and correction of material and housekeeping deficiencies. Specific areas that need attention include the following:

- a. steam leaks in the secondary plant
- b. mechanical equipment packing leaks throughout the plant
- c. corrosion on pipes and equipment
- d. maintenance materials and equipment not removed after maintenance activities

**Recommendation**

Place more emphasis on prompt correction of steam and water leaks. Initiate action to increase management and supervisory involvement in identification and correction of material and housekeeping deficiencies. Emphasize to all plant personnel the need to identify and report material deficiencies on a routine basis. Establish a program of periodic, detailed plant inspections, involving management and supervisory personnel, to identify material deficiencies.

**Response**

A program of periodic, detailed plant inspections involving management and supervisory personnel has been established. This program, when combined with the actions taken in MA.3-1, will provide an appropriate level of management attention to identification and correction of material and housekeeping deficiencies.

**Finding**  
(MA.2-2)

**Mechanical and electrical shops were not maintained in a clean and orderly manner.** As a result, inefficient working conditions and personnel hazards were observed.

In response to evaluation team comments, substantial improvements were made in shop conditions during the period of the evaluation.

**Recommendation** Continue to promote greater involvement by supervisors to ensure efficient and hazard-free working conditions are maintained in the shops.

**Response** Extensive improvements have been made in shop conditions in order to provide more efficient working conditions as well as to eliminate any potential safety hazards in the shops.

Construction is currently underway on the Machine Shop Replacement Facility, which will house both the electrical shop and the mechanical shop. This new facility will provide more space and an environment more conducive to shop and department efficiency. The new facility will be fully operational by March 1, 1982. Continuing supervisory attention to housekeeping conditions will be emphasized.

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### WORK CONTROL SYSTEM

**PERFORMANCE OBJECTIVE:** Provide an administrative control system within which equipment problems can be identified and reported, and safely and efficiently dispositioned and documented.

**Finding**  
(MA.3-1) Numerous plant deficiencies identified during the evaluation were not reflected in the work control system. As a result, the work control system does not reflect actual plant conditions and the appropriate priority of corrective maintenance. Improvements are needed in the existing system for tagging deficient conditions that have been reported for maintenance action.

**Recommendation** Ensure that material and housekeeping deficiencies are documented, responsibility for correction is assigned, and progress toward correction is tracked. Emphasize the importance of attaching the "work request submitted" tags and of reporting deficient conditions that are not tagged.

**Response** Individual labor foremen have been assigned responsibility for housekeeping in designated plant areas. A checklist is used for periodically inspecting these areas and following corrective actions. A memorandum has also been issued, for all station employees, emphasizing the need to identify and report deficiencies. The proper use of "work request submitted" tags will be emphasized. The above actions, when combined with the management inspection effort presented in response to MA.2-1, should provide for timely identification and correction of housekeeping and material deficiencies.

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**Finding**  
(MA.3-2)

**Increased attention to the correction of valve packing deficiencies is needed.** Many packing leaks were noted that could have been prevented by early attention to repairs or by a more conscientious program to correct packing deficiencies during the recently completed outage. The lack of effective leak inspections when returning fluid systems to service contributes to this problem.

**Recommendation**

Implement a more aggressive valve packing maintenance program. It should include pre-outage inspection of glands so that repairs and preventive maintenance can be completed during outages. It should also include prompt inspection for leaks and adjustment of leaking glands when fluid systems are returned to service. Use the work control system to ensure that appropriate inspections are completed when repaired equipment is returned to service.

**Response**

A pre-outage inspection of glands was conducted prior to the Unit 2 November refueling outage. A formal program addressing the concerns above will be placed in effect by March 1, 1982. In the interim, assigned supervisors will conduct plant walkdowns to ensure prompt identification of leaks and adjustment of leaking glands. These walkdowns will be conducted on a regular basis and when fluid systems are returned to service to ensure no further degradation of valve packing.

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**Finding**  
(MA.3-3)

**Present work control procedures do not ensure the ultimate correction of temporary repairs.** For example, temporary on-line steam leak repairs had not been replaced with permanent repairs, and several of these were leaking again.

**Recommendation**

Establish a method within the work control system to identify temporary repairs and ensure permanent repairs are made as soon as practicable.

**Response**

A complete walkdown was conducted to identify and document all on-line repairs of an interim nature. Materials have been ordered to replace these with permanent repairs. The permanent repairs will be completed during scheduled maintenance outages based on material availability and outage requirements.

A formal work control program will be instituted by March 1, 1982 to ensure control and permanent correction of all temporary repairs.

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**Finding**  
(MA.3-4) **Improvements are needed in the control of maintenance activities associated with safety-related equipment and components.**

**Recommendation** Establish a system to ensure maintenance reports are reviewed to properly designate safety-related work and specify retest requirements. Modify procedures to ensure a conscious decision concerning designation of work as safety-related or non-safety-related is made in each case where work is authorized.

**Response** A program is in place to ensure a conscious decision is made concerning designation of work requests as safety-related or non-safety-related. In addition, the Inservice Inspection program is undergoing a major updating to ensure appropriate identification of testing requirements for all equipment following maintenance. The improved program will be in place by December 31, 1982.

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#### MAINTENANCE HISTORY

**PERFORMANCE OBJECTIVE:** Provide a complete and functional maintenance history supporting an evaluation program which contributes to improvements in equipment performance.

**Finding**  
(MA.5-1) **The present method of documenting maintenance history provides insufficient information for useful history analysis.** As a result, maintenance and engineering personnel do not use the maintenance history.

**Recommendation** Modify the maintenance report form to permit adequate information to be recorded. Ensure that meaningful history information is entered for transcription into the maintenance history.

**Response** An improved maintenance reporting program is being developed for Surry and North Anna. This computerized system will be operational by July 1, 1982. It will include provisions to record and retain adequate maintenance history information. In the interim, maintenance reports will be reviewed by supervisors to ensure more meaningful history information is recorded.

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**PREVENTIVE MAINTENANCE (PM)**

**PERFORMANCE OBJECTIVE:** Optimize equipment reliability and performance to enhance plant safety and availability.

**Finding (MA.6-1)**                      **The condition of some mechanical equipment reflects a need for improvement in the preventive maintenance program.** Presently the main feed pumps are the only non-safety-related equipment included in the preventive maintenance program.

**Recommendation**              Continue with current efforts to improve the preventive maintenance program. Determine which equipment or components, by virtue of their purpose, function, or design, should receive periodic routine maintenance to ensure reliability; then objectively establish the type and frequency of maintenance actions necessary to achieve the desired results.

**Response**                              The Mechanical Preventive Maintenance Program, which was in preparation at the time of the INPO evaluation, has been completed and issued to include safety-related and non-safety-related equipment.

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**Finding (MA.6-2)**                      **The following Good Practice was noted: Extensive vibration checks of rotating electrical equipment are performed to provide useful predictive maintenance information.**

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RADIATION PROTECTION AND CHEMISTRY

MANAGEMENT OF RADIOLOGICAL PROTECTION

**PERFORMANCE OBJECTIVE:** Provide effective management of the radiological protection program.

**Finding**  
(RC.1-1)

**Collection and dissemination of radiological control information needs improvement.** The plant presently has no system to keep individual exposure records updated for individual worker and supervisor use. Total radiation exposure for the year, the number of individuals with exposures greater than 5 rem/year, and the number of personnel skin contaminations cannot be readily determined. This impedes the analysis of significant radiological information and limits the effectiveness of efforts to improve radiological controls. It is understood that the Personnel Radiation Exposure Monitoring System (PREMS) will address many of these problems.

**Recommendation**

Implement the PREMS system as planned. Include the ability to maintain and analyze information such as personnel exposure records; bioassay data; respiratory protective equipment qualifications; training status; and exposure accumulation by job, component, or Radiation Work Permit (RWP).

**Response**

The Personnel Radiation Exposure Management System has been implemented. This system provides extensive capability in the areas of exposure tracking, training and qualification status, and job-related exposure information.

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**Finding**  
(RC.1-2)

**Adherence to radiation protection procedures needs more emphasis.** Personnel often do not monitor their hands, feet, and dosimetry devices for contamination, as required by posted instructions. Contamination monitoring speed is not always as slow as specified. Personnel were observed entering, exiting, and within contaminated areas without the protective clothing prescribed on the applicable RWP.

**Recommendation**

Enforce existing radiological protection procedures and requirements. Emphasize adherence to procedures by methods such as department meetings, training programs, posted instructions, and

on-the-spot correction of errors. Revise training programs and instructions to reflect the need to use sensitive beta detectors to check the trunk and extremities for contamination when leaving contaminated areas and to place particular emphasis on areas most likely to be contaminated.

**Response**

The general employee training program will be reviewed and evaluated by March 31, 1982 to determine those areas in which improvements can be made. Personnel monitoring requirements and techniques will be emphasized and practical knowledge enhanced by demonstrations. Additionally, health physics and supervisory personnel have been instructed to increase surveillance and identification of radiological procedures violations. Violations are reported to appropriate supervisory personnel for review and possible follow-up action.

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**RADIOLOGICAL PROTECTION TRAINING**

**PERFORMANCE OBJECTIVE:** Ensure that personnel on the site have the knowledge and practical abilities necessary to effectively implement radiological protection practices associated with their work.

**Finding  
(RC.2-1)**

**Practical abilities need greater emphasis during general employee training.** Personnel are not required to demonstrate a practical knowledge of frisking techniques or of donning and removing protective clothing and respiratory equipment. Personnel are not required to demonstrate the use of a radiation survey instrument they may be required to use.

**Recommendation**

Expand the general employee training program to require a satisfactory demonstration of practical radiological protection skills by trainees who have not had appropriate prior experience.

**Response**

The general employee training program will be expanded to include demonstration of practical skills related to radiation protection by trainees who have not had appropriate prior experience. The expanded GET program will be implemented by March 31, 1982.

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**PERSONNEL DOSIMETRY**

**PERFORMANCE OBJECTIVE:** Accurately determine and record radiation exposures.

<b>Finding</b> (RC.3-1)	<b>Improved guidance is needed for the use and placement of multiple personnel dosimeters.</b> The point of highest exposure for the whole body, skin, or extremities needs to be monitored. Location of multiple dosimeters has been left to the judgment of persons who prepare RWPs, even though comprehensive radiation surveys have not always been available to those persons.
<b>Recommendation</b>	Establish written guidance for the use and placement of dosimeters when detailed radiation surveys indicate that extremity, skin, or multiple whole body monitoring may be appropriate. Ensure that the point of highest exposure is monitored.
<b>Response</b>	Improved procedural guidance and more detailed criteria will be utilized to ensure adequate consideration of special or non-uniform external exposure situations. Implementation will be effected by June 1, 1982.

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**EXTERNAL RADIATION EXPOSURE**

**PERFORMANCE OBJECTIVE:** Minimize personnel external radiation exposure.

<b>Finding</b> (RC.4-1)	<b>Personnel radiation exposure reduction (ALARA) efforts need additional emphasis.</b> Extensive exposure reduction efforts were made for the steam generator replacement program, and similar efforts are needed for routine outages and during plant operation. For example, several workers were observed waiting for over 10 minutes in a 40 mrem/hr field, rather than waiting in an area with lower radiation levels.
<b>Recommendation</b>	Complete the development and implementation of the formal ALARA program, including instructions for preplanning jobs, following exposure trends, and initiating corrective actions if exposure accumulation is excessive. Establish exposure goals for specific jobs with significant anticipated exposures and overall annual exposure goals.
<b>Response</b>	Implementation of the ALARA program will begin in January 1982 and will be completed by the end of the year. The program will provide specific guidance with respect to the following:

- a. personnel responsibilities and training
- b. task preplanning and post-job evaluation based on estimated and actual exposure accumulation
- c. procedure and design modification reviews for potential exposure reductions

Exposure goals for specific jobs with significant anticipated exposures and overall annual exposure goals will be established. Performance toward meeting these goals will be evaluated frequently through use of the PREMS.

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### INTERNAL RADIATION EXPOSURE

**PERFORMANCE OBJECTIVE:** Minimize internal exposure due to radioactivity associated with the plant.

**Finding**  
(RC.5-1)

**The bioassay program needs to be strengthened.** Annual whole body counts are sometimes missed. More frequent counts need to be made when air samples show the presence of short-lived radionuclides such as iodine. The chair type whole body counter has computer software problems that have caused incorrect identification of radionuclides.

**Recommendation**

Revise the bioassay program to require more frequent bioassays when air samples or whole body counts show the presence of short-lived radionuclides. Perform follow-up bioassays and exposure circumstance evaluations when appropriate. Use ANSI N343-1978, "Internal Dosimetry for Mixed Fission and Activation Products," for guidance.

Correct the chair counter software problem and correlate results from the chair and bed whole body counters.

**Response**

The bioassay program is currently under evaluation to determine those areas requiring improvement. ANSI N343-1978 is being used as a guide for this evaluation. The need for improved and formalized evaluation guidelines to assess suspected internal exposures is recognized, and a more detailed procedural instruction will be developed and implemented by April 30, 1982. The current evaluation has identified the software problems associated with the chair type whole body counter. Further study to determine the capabilities and limitations of both the chair and bed counters will be completed by June 30, 1982.

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- Finding (RC.5-2)** **Eating, drinking, and smoking are not always prevented in radioactively contaminated areas.** Soft drink cans and cigarette butts were observed inside posted contamination areas. Technicians and supervisors were observed eating and smoking in the counting room.
- Recommendation** Establish and enforce a policy that prohibits personnel from eating, drinking, smoking, and chewing tobacco in radioactively contaminated areas of the plant. Incorporate these requirements into the general employee training program.
- Response** Established policies currently prohibit eating, drinking, and smoking in contaminated areas. General employee training currently addresses the requirements associated with radioactively contaminated areas. Additional emphasis will be placed on training of personnel and enforcement of the station policy regarding this matter. Observed violations will be reported to appropriate supervisory personnel for corrective action.
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#### RADIOACTIVE EFFLUENTS

**PERFORMANCE OBJECTIVE:** Minimize releases of radioactive effluents to the environment.

- Finding (RC.6-1)** **Generation of liquid radioactive waste needs to be reduced.** Liquid and steam leaks in the auxiliary building contribute to the volume of liquid waste that must be processed by ion exchange prior to release. Leaks within the reactor containments have generated large volumes of liquid waste.
- Recommendation** Place more emphasis on the isolation and repair of leaks that unnecessarily contribute to the volume of waste that must be processed prior to release to the environment.
- Response** The program cited in the response to Finding MA.2-1 will reduce steam and water leaks which contribute to liquid waste volumes. Repairs and design changes have been completed on the auxiliary feed system of both units to eliminate past sources of large volumes of leakage.
-

**SOLID RADIOACTIVE WASTE**

**PERFORMANCE OBJECTIVE: Minimize solid radioactive waste volumes.**

**Finding (RC.7-1)**                    **Additional efforts are needed to reduce the generation of solid radioactive waste.** While plant procedures exist that direct personnel to minimize the amount of material taken into controlled areas, observations indicate that such practices are often not being followed.

**Recommendation**            Enforce existing procedures to reduce extraneous material taken into radiologically controlled areas. Consider employing methods that segregate radioactive from non-radioactive material in controlled areas such as the auxiliary building. Review work practices in contaminated areas to identify where improvements in procedures or technique could reduce the quantity of material that becomes contaminated.

**Response**                      A consultant was recently selected to evaluate company practices relative to solid radioactive waste and to make recommendations for reducing solid waste generation. Pending receipt of those recommendations, the station will review current practices and by March 15, 1982 determine and implement interim measures to reduce solid radioactive waste generation.

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**RADIOACTIVE CONTAMINATION CONTROL**

**PERFORMANCE OBJECTIVE: Minimize contaminated equipment and areas in the plant and minimize personnel contamination.**

**Finding (RC.9-1)**                    **The number of areas in the plant requiring protective clothing needs to be reduced.** Contaminated areas in the auxiliary and turbine buildings need to be eliminated or reduced in size to minimize their impact on personnel mobility and on solid radioactive waste generation. Narrow passages between contaminated areas in the auxiliary building hamper personnel and equipment movement. Unused contaminated equipment impedes work inside contaminated areas in the auxiliary building.

**Recommendation**            Establish an aggressive program to eliminate or minimize sources of radioactive contamination and reduce, by decontamination, the number and size of controlled loose surface contamination areas in the plant.

**Response** Prior to the INPO evaluation, a major cleanup and decontamination effort was initiated in the auxiliary building. This ongoing effort is aimed at reducing the number and size of contaminated areas to a minimum and will include those potentially contaminated areas in the turbine building. Progress in this effort will be included in the six-month report to INPO. Controls to maintain cleanliness in controlled plant areas have been established and will be vigorously enforced.

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**Finding (RC.9-2)** **Some contaminated areas need to be more adequately posted and barricaded.** Some radioactively contaminated materials were not isolated and identified by barriers and postings. For example, condensate pumps in the Unit 1 turbine building were labeled "contaminated" but were not barricaded.

**Recommendation** Reinstruct technicians in the proper methods for posting and barricading radioactive materials. Establish a system of periodic inspection of all posted areas by designated personnel, and place more emphasis on supervisory inspections to ensure posting and barricading is adequate.

**Response** Individual health physics technicians are assigned specific responsibility for designated areas of the station. The condition of these areas will be inspected more frequently by supervisory personnel to ensure adequate surveillance is performed and required controls are established.

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**Finding (RC.9-3)** **The potential for spreading contamination to the environment needs to be reduced.** Large amounts of radioactive material are stored in outside work areas exposed to precipitation. A large concrete pad used to store radioactive material is exposed to the weather. Water was observed leaking onto the ground from a radioactive waste tank that was being worked. Dirt excavated to perform work on underground piping was being handled as radioactive.

**Recommendation** Provide additional protection for radioactive material that must be stored outside. Decontaminate as much of the material as possible.

**Response**

A program to decontaminate or dispose of the large volume of contaminated materials produced during the steam generator replacement project and other major design modifications was initiated in July of this year. This program utilized a wide array of decontamination techniques and has been successful in reducing the total volume of radioactive materials requiring disposal. It will continue into mid-1982.

Materials stored outside awaiting processing are wrapped or otherwise protected to minimize the potential for spread of contamination. The radioactive liquid leak was repaired. Surveys and monitoring are being routinely conducted to ensure against spread of radioactivity from the stored material.

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**Finding  
(RC.9-4)**

**Handling of liquid waste needs improvement to reduce the spread of contamination.** The radioactive liquid waste system periodically overflows through the drain in the protective clothing laundry room and the drain near the control point exit. This requires isolation of the area to prevent personnel and equipment from being contaminated. Two overflows occurred during the evaluation. Better coordination between operations and health physics personnel could prevent overflows.

**Recommendation**

Implement procedures that ensure laundry personnel know when the laundry drain line is isolated. Implement use of the new laundry waste collection tank.

**Response**

A new storage facility and system has been installed and is in operation. The increased capacity of this facility will alleviate the problem of having to shut down the laundry to release the Contaminated Drain Tanks. Improved communications between health physics and operations personnel is also being emphasized.

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**CHEMISTRY**

**PERFORMANCE OBJECTIVE:** Ensure accurate measurement and effective control of chemistry parameters.

**Finding**  
(RC.10-1)

The following Good Practice was noted: A corporate Quality Control Sample Program that provides spiked samples has been established to provide a timely and recurring check of the performance of chemistry laboratory equipment and the individual technicians.

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## TECHNICAL SUPPORT

### ON-SITE TECHNICAL SUPPORT ORGANIZATION AND ADMINISTRATION

**PERFORMANCE OBJECTIVE:** Have a clearly defined on-site technical support organization that is adequately staffed, assigns responsibility, and delegates adequate authority for the accomplishment of required tasks.

**Finding (TS.1-1)**                      **Training of on-site engineering personnel needs improvement.** Current training for engineers consists of an informal program limited to a tour through station departments, monthly lectures, and vendor seminars.

**Recommendation**              Evaluate the knowledge and skill requirements for station engineering personnel, and expand the technical support department training program to address development of appropriate engineering skills. Consider the need for training in plant systems and components and specialized engineering tasks.

**Response**                      Improvement actions have been identified and scheduled, including the following:

- a. formalizing the existing training program to include schedules and course content
- b. modifying the existing operator development program to establish accelerated training in plant systems for engineers
- c. developing engineering function descriptions and minimum training requirements for each function

Items a. and b. will be completed by June 1, 1982, and item c. will be completed by January 1, 1982.

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### PLANT EFFICIENCY AND RELIABILITY

**PERFORMANCE OBJECTIVE:** Optimize plant thermal efficiency and reliability.

**Finding (TS.2-1)**                      **The program for monitoring plant thermal performance needs improvement.** Some plant parameters are monitored by observation of control room instrumentation, shift log reviews, and required in-service testing of safety-related equipment. However,

the plant does not routinely collect, analyze, and trend comprehensive thermal performance data or utilize analysis results to improve plant thermal efficiency.

**Recommendation** Implement a more comprehensive plant thermal performance monitoring program. Consider the use of available computer programs, systematic evaluation of individual system and component performance, and trending of key plant parameters. Assign responsibility for implementation of the program to appropriately qualified individuals.

**Response** The performance engineer is responsible for monitoring plant performance. The existing monitoring program is not formalized in that the frequency of routine walkdowns, data analysis, and other activities is not specified, and the review of results and approval of recommended corrective action is not documented. The program will be formalized by August 1, 1982. This is intended to include adaptation and application of the Performance Evaluation of Power System Effectiveness (PEPSE) computer code to the Surry secondary plant.

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### NUCLEAR OPERATING EXPERIENCE EVALUATION PROGRAM

**PERFORMANCE OBJECTIVE:** Ensure industrywide and in-house operating experiences are evaluated and appropriate actions are taken to improve personnel awareness and equipment reliability.

**Finding (TS.3-1)** Action on some recommendations included in INPO Significant Operating Experience Reports (SOERs) has not been completed. Although the VEPCO operating experience review program has developed appropriate responses to most significant events, some further effort is needed to ensure that all the items identified in SOER recommendations are adequately addressed. SOER recommendation status for SOERs 80-1 through 80-6 and 81-1 through 81-14 is as follows:

<u>Number of Recommendations</u>	<u>Action Taken</u>
27	Satisfactory
39	Not Applicable
7	Pending
7	Need further review

The recommendations pending action are:

<u>SOER Number</u>	<u>Recommendation Numbers</u>
81-3	2
81-5	3, 4
81-9	1, 2a, 2b, 2c

The recommendations needing further review are:

<u>SOER Number</u>	<u>Recommendation Numbers</u>
80-2	1, 2
80-3	1, 2
80-4	1, 2, 3

**Recommendation** Initiate further review or complete action, as appropriate, on the SOER recommendations listed above. Advise INPO of the status of action on each of the listed recommendations in the response to this report.

**Response** The status of recommendations is as listed above. Additional status information will be provided in the six-month report, including projected completion dates for action on each listed recommendation, where known.

**Finding (TS.3-2)** **Evaluation of in-house events, other than those associated with Licensee Event Reports (LERs), needs improvement.** The operating experience program has not included screening non-reportable occurrences for possible lessons to be learned.

**Recommendation** Expand the operating experience review program to include significant plant events other than Licensee Event Reports.

The Significant Operating Event (SOE) program recently reinstated by the Operations Department, and the trip reporting systems being developed by the Safety Engineering Staff, appear to be major steps in meeting this objective.

**Response** Deviation Reports are initiated for all operating events which might be reportable as LERs. All Deviation Reports are now forwarded to the Safety Engineering Staff and will be screened for lessons learned as stated in this recommendation.

**Finding (TS.3-3)**      **Periodic evaluation of the effectiveness of the operating experience program review is needed.** As an example, although the current program addresses timeliness of Significant Operating Experience Report (SOER) review, five recent SOERs had not been reviewed by the responsible persons within the time period specified in the program.

**Recommendation**      Include periodic program effectiveness evaluations in the operating experience review program. The evaluations should address such questions as the following:

- a. Is the scope of the program appropriate?
- b. Are events being properly classified?
- c. Are reviews and determination of final actions being completed in a timely manner?
- d. Are appropriate personnel receiving all information pertinent to their duties and not receiving extraneous or duplicate information?
- e. Are actions resulting from the review process appropriate, and are they completed in a timely manner?

**Response**      Such a program will be developed and implemented in 1982.

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**Finding (TS.3-4)**      **The following Good Practice was noted: The synopsis reports generated by the Safety Engineering Staff are an effective tool for dissemination of industry experience information to appropriate staff personnel.**

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### PLANT MODIFICATIONS

**PERFORMANCE OBJECTIVE: Provide a program to implement plant modifications in a timely manner while maintaining the quality of plant systems and components.**

**Finding (TS.4-1)**      **The mechanism that ensures timely completion of as-built document revisions, procedure revisions, and operator training associated with plant modifications needs improvement. The station**

has implemented a mechanism to track progress on these items, but it does not ensure that work is completed before operation of the modified equipment.

**Recommendation** Incorporate the current station "Technical Review" into the design control program to ensure that as-built documents, procedures, and operator training are updated prior to placing modified systems in service.

**Response** This item was previously identified by VEPCO, and a change to the Nuclear Power Station Quality Assurance Manual (NPSQAM) was submitted. The improved controls will be in effect by March 1, 1982.

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**Finding (TS.4-2)** **Some documents are not revised in a timely manner to reflect plant modifications.** Such documents include the Final Safety Analysis Report (FSAR), system descriptions, and as-built drawings. Some final drawing revisions have been outstanding for more than six months. Efforts are underway to update the FSAR.

**Recommendation** Continue current efforts to update the FSAR. Monitor progress to ensure timely completion. Establish a method to ensure that other support documents described in the NPSQAM, such as system descriptions, are updated in a timely manner. Implement the in-house recommendation that final as-built drawing revisions be completed within 90 days after completion of a plant modification.

**Response** The FSAR update is continuing and is scheduled for completion in June 1982. A plan has been initiated to expedite the completion of all outstanding document reviews. The initial phase of this plan was completed October 1 with the completion of the drawing revisions for station design changes. The total document update effort will be completed in June 1982. Document reviews for design changes completed since October 1, 1981 are being completed as prescribed in the NPSQAM in a timely manner. Final review to determine the feasibility of completing changes to as-built drawings within 90 days will be completed by June 1982. The results of the review will be included in the six-month status report.

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<b>Finding</b> (TS.4-3)	<b>Management attention is needed to resolve long-standing problems with the reliability of the charging pump service water pump.</b> Lack of adequate suction pressure has caused service water inoperability on numerous occasions. It was reported that operators did not run charging pumps on some occasions when they were needed because the service water pumps could not supply cooling. Although design modifications were accomplished, the problem remains. It was reported that further design changes are planned, but the effectiveness of these changes is in doubt.
<b>Recommendation</b>	Conduct a thorough review of the reliability problems with the charging pump service water pumps to evaluate the effectiveness of the proposed design changes and to determine what other short- and long-term actions are necessary to achieve reliable performance.
<b>Response</b>	Such a review is underway. Recommended actions and a schedule for their completion will be established by February 1, 1982.

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### ON-SITE REACTOR ENGINEERING

**PERFORMANCE OBJECTIVE:** Optimize nuclear reactor operations without compromising design or safety limits and control nuclear fuel handling activities to ensure safety of personnel and equipment.

<b>Finding</b> (TS.5-1)	<b>The mechanism for updating important plant process computer variables, and routinely and independently verifying their accuracy, needs improvement.</b> Examples of parameters and programs that are considered important are power level (from secondary heat balance), control rod deviations, delta flux alarms, and the flux mapping data collection.
<b>Recommendation</b>	Improve the program for managing computer software and changes to it. Include the following elements: <ol style="list-style-type: none"><li>determination of the variables and calculations important to plant operation</li><li>review of each change to the computer software to determine potential significance</li><li>routine, independent verifications of engineering calculations</li><li>timely update of software to accommodate changes in plant or reactor core design</li></ol>

**Response**

Such a study will be performed and a procedure developed to ensure the continuing adequacy of computer calculations. It will include the recommended elements. The projected completion date is June 1, 1982.

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## ORGANIZATION AND ADMINISTRATION

### ORGANIZATIONAL OBJECTIVES

**PERFORMANCE OBJECTIVE:** Establish mission, goals, and objectives for the organizational units that improve plant activities or maintain them at high levels of safety and reliability, and establish the process to achieve the mission, goals, and objectives.

- Finding**  
(OA.1-1)                      **The management goals program needs improvement.** Although substantive management goals are used by the plant manager and several department heads, the Maintenance Department does not participate. Several goals provide targets for performance improvement (e.g., increase efficiency by 1 percent), but are not supported by trackable planned actions that describe management efforts to achieve the goal.
- Recommendation**                      Expand the management goals program to include trackable planned actions that support performance goals. Use the planned actions to track progress during the year and to encourage deliberate management action to achieve performance goals.
- Response**                                      The Maintenance Department has established performance goals and objectives for the remainder of 1981. The 1982 written goals and objectives will be expanded to include trackable planned actions. The 1982 goals will be finalized by January 31, 1982.
- 

### MANAGEMENT QUALITY PROGRAMS

**PERFORMANCE OBJECTIVE:** Provide management with accurate indication of the extent of adherence to policies, administrative controls, codes, regulations, and effectiveness in meeting plant mission, goals, and objectives.

- Finding**  
(OA.5-1)                      **The effectiveness of the quality assurance program needs improvement.** A review of inspection reports indicated that inspection findings and corrective actions often did not address the basic causes of the deficiencies noted. A lack of appropriate operational experience on the quality assurance staff appears to contribute to this problem.
- Recommendation**                      Increase the level of operational knowledge on the quality assurance staff. Consider operational training programs, such as rotation of personnel through positions on the plant staff and classroom training in Surry and Vepco operating practices. Periodically review inspection reports and the results of corrective actions to identify quality program weaknesses and to focus attention on identifying the basic causes of deficiencies.

**Response** Several changes have been implemented recently that should improve the overall level of operational knowledge on the quality assurance staff. One change is a substantial improvement in the training program for quality control personnel. A step training program for inspectors was implemented on June 1, 1981. This program just recently received endorsement by the Virginia Department of Education and the Veterans Administration. The other change is the recent transfer of a senior reactor operator to the staff. Additionally, consideration will be given to operational training programs by assigning quality control personnel to the reactor operator's course when practicable. These changes should add to the effectiveness of the quality assurance program by promoting meaningful inspection findings and analyses of corrective actions to ensure that the basic cause of a deficiency has been addressed. An assessment of the effectiveness of the program will be made during the Corrective Action Audit, which is conducted twice a year.

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### INDUSTRIAL SAFETY

**PERFORMANCE OBJECTIVE:** Provide an orderly working environment in which station personnel may carry out their work activities safely.

**Finding** (OA.7-1) **Administrative coordination of the on-site industrial safety program needs improvement.** Safety goals are not well defined or effectively pursued. Tracking of measurable objectives such as injuries and lost-time accidents is inefficient. Violations of published safety rules are not vigorously identified and corrected.

**Recommendation** Develop and implement improved systems for collecting and analyzing information on lost-time accidents and industrial safety practices that might need correction. Adopt a more aggressive management policy toward enforcement of approved safety practices and overall improvements in safety performance.

**Response** A program has been initiated to facilitate the tracking and trending of lost-time accidents. This program will provide department heads, on a monthly basis, a collection and analysis of accident facts spotlighting their areas of responsibility. Department heads will then be able to define their goals and concentrate their efforts on reducing the number of lost-time accidents and improving safety methods for their departments. This program became effective on November 1, 1981.

A program of education and enforcement in safety practices will be initiated for station supervisory personnel. The safety office will trend lost-time and selective duty accidents versus man hours worked by department and provide this information to supervisory personnel so positive corrective action can be taken. A positive and more complete use of safety bulletins and quarterly safety meetings will be accomplished to promote safety awareness throughout the station. This program will be in full effect by the end of February 1982.

Station management in conjunction with other management executives of the VEPCO Nuclear Operations Department have formed a safety activity committee. The objective of the committee is to monitor safety activities in the Nuclear Operations Department area of responsibility and to personally review all serious accidents with those involved and their supervisors. This more aggressive policy by management should assist greatly in achieving the goal of a better station record for safety performance. A lower lost-time accident record should be achieved. This policy became effective on October 1, 1981.

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APPENDIX

Performance Objectives Reviewed

TRAINING AND QUALIFICATION

TQ.1 Training Organization

Provide a clearly defined training organization staffed with qualified personnel capable of accomplishing all assigned training tasks.

TQ.2 Training Administration

Ensure that activities necessary to initiate and control personnel qualification programs are accomplished in a well-defined, coordinated, and effective manner.

TQ.3 Training Facilities and Equipment

Provide the training facilities, equipment, and materials for development and evaluation of knowledge and skills needed by nuclear plant personnel.

TQ.4 Non-Licensed Operator Training

Develop and maintain the skills and knowledge necessary for non-licensed operators to perform their assigned job functions.

TQ.5 Licensed Operator Training

Develop the skills and knowledge necessary for licensed operators to perform their assigned job functions.

TQ.6 Licensed Operator Requalification Training

Maintain the skills and knowledge necessary for licensed operators to perform their assigned job functions.

TQ.7 Shift Technical Advisor Training

Develop and maintain the skills and knowledge necessary for Shift Technical Advisors (STA) to perform their assigned job functions.

TQ.8 Maintenance Personnel Training

Develop and maintain the skills and knowledge necessary for maintenance personnel to perform their assigned job functions.

OPERATIONS

OP.1 Operations Organization and Administration

Provide a clearly defined operations organization that is adequately staffed, assigns responsibilities, and delegates adequate authority for the accomplishment of required tasks.

OP.2 Operations Facilities and Equipment

Provide plant facilities and equipment that are operated and maintained at a level to support safe and efficient operation.

OP.3 Conduct of Shift Operations

Ensure that shift operations are conducted in a safe and reliable manner.

OP.4 Plant Operations Procedures

Provide timely, effective guidance to operators in the form of written procedures.

OP.5 Plant Status Controls

Maintain plant status in a condition that ensures equipment and system availability as necessary for safe and reliable plant operations at all times.

OP.6 Shift Turnover

Ensure a continuous and correct understanding of plant conditions at all shift operating positions through proper shift turnover.

OP.7 Tagout Practices

Protect personnel and plant equipment by implementing effective tagout practices.

MAINTENANCE

MA.1 Maintenance Organization and Administration

Provide a clearly defined maintenance organization that is adequately staffed, assigns responsibilities, and delegates adequate authority for the accomplishment of required tasks.

MA.2 Maintenance Facilities and Equipment

Support the performance of maintenance activities by providing adequate facilities and equipment.

MA.3 Work Control System

Provide an administrative control system within which equipment problems can be identified and reported, and safely and efficiently dispositioned and documented.

MA.4 Maintenance Procedures

Ensure that adequate plant maintenance procedures exist and are utilized to achieve quality by the safe and reliable conduct of maintenance activities.

MA.5 Maintenance History

Provide a complete and functional maintenance history supporting an evaluation program which contributes to improvements in equipment performance.

MA.6 Preventive Maintenance (PM)

Optimize equipment reliability and performance to enhance plant safety and availability.

MA.7 Control of Measurement and Test Equipment (M&TE)

Control the use and calibration of measurement and test equipment to ensure the necessary accuracy for calibrated devices.

MA.8 Control of Special Processes

Ensure that the control and performance of special processes yields quality results.

RADIATION PROTECTION AND CHEMISTRY

RC.1 Management of Radiological Protection

Provide effective management of the radiological protection program.

RC.2 Radiological Protection Training

Ensure that personnel on the site have the knowledge and practical abilities necessary to effectively implement radiological protection practices associated with their work.

- RC.3 Personnel Dosimetry  
Accurately determine and record radiation exposures.
- RC.4 External Radiation Exposure  
Minimize personnel external radiation exposure.
- RC.5 Internal Radiation Exposure  
Minimize internal exposure due to radioactivity associated with the plant.
- RC.6 Radioactive Effluents  
Minimize releases of radioactive effluents to the environment.
- RC.7 Solid Radioactive Waste  
Minimize solid radioactive waste volumes.
- RC.8 Transportation of Radioactive Material  
Meet the requirements for transportation of radioactive material.
- RC.9 Radioactive Contamination Control  
Minimize contaminated equipment and areas in the plant and minimize personnel contamination.
- RC.10 Chemistry  
Ensure accurate measurement and effective control of chemistry parameters.

TECHNICAL SUPPORT

- TS.1 On-site Technical Support Organization and Administration  
Have a clearly defined on-site technical support organization that is adequately staffed, assigns responsibility, and delegates adequate authority for the accomplishment of required tasks.
- TS.2 Plant Efficiency and Reliability  
Optimize plant thermal efficiency and reliability.

TS.3 Nuclear Operating Experience Evaluation Program

Ensure industrywide and in-house operating experiences are evaluated and appropriate actions are taken to improve personnel awareness and equipment reliability.

TS.4 Plant Modifications

Provide a program to implement plant modifications in a timely manner while maintaining the quality of plant systems and components.

TS.5 On-site Reactor Engineering

Optimize nuclear reactor operation without compromising design or safety limits and control nuclear fuel handling activities to ensure safety of personnel and equipment.

ORGANIZATION AND ADMINISTRATION

OA.1 Organizational Objectives

Establish mission, goals, and objectives for the organizational units that improve plant activities or maintain them at high levels of safety and reliability, and establish the process to achieve the mission, goals, and objectives.

OA.2 Organizational Structure

Provide an organizational structure that supports the effective management of nuclear power plant operation.

OA.3 Manpower Resources

Ensure that qualified individuals are available to fill all job positions supporting plant safety and reliability.

OA.4 Administrative Controls

Provide well-defined, organized, and effective administrative controls to direct the tasks, responsibilities, and practices within the organization to meet the specified mission, goals, and objectives.

OA.5 Management Quality Programs

Provide management with accurate indication of the extent of adherence to policies, administrative controls, codes, regulations, and effectiveness in meeting plant mission, goals, and objectives.

OA.6 Surveillance Program

Provide surveillance programs to accomplish coordinated monitoring, inspection, and testing to ensure safe, reliable operation of plant equipment and facilities.

OA.7 Industrial Safety

Provide an orderly working environment in which station personnel may carry out their work activities safely.

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