

APPENDIX A OPERATIONS CATEGORY TABLE OF REPORTS

Volume 3, Operations Category, consists of 73 separate reports -- one category report, 13 subcategory reports, and 59 element reports specific to Sequoyah Nuclear Plant. Each report within Volume 3 is identified below by title along with a part number corresponding to its Employee Concerns Special Program report number.

<u>PART</u>	<u>REPORT TYPE AND NUMBER</u>	<u>TITLE</u>
30000	Category Report 30000	Category Summary and Conclusions
30100	Subcategory Report 30100	Mechanical Equipment Reliability/Design
30101	Element Report 30101-SQN	Kerotest Valve Leakage/Corrosion
30102	Element Report 30102-SQN	Diesel Generator Reliability Problems
30105	Element Report 30105-SQN	Questionable Design/ Construction Practices
30107	Element Report 30107-SQN	General Paint, Reactor Building
30108	Element Report 30108-SQN	Steam Generator Manway Installation
30111	Element Report 30111-SQN	Valve Closure Problem
30112	Element Report 30112-SQN	Improper Operation of System 31
30114	Element Report 30114-SQN	Malfunction of Doors
30115	Element Report 30115-SQN	Improper Hardware Identification
30200	Subcategory Report 30200	Electrical and Communications
30201	Element Report 30201-SQN	Possible Lack of Watertight Conduit and Connections
30202	Element Report 30202-SQN	Low Line Voltage
30204	Element Report 30204-SQN	Ground and Electrical Shock Problems
30206	Element Report 30206-SQN	Transfer Canal Electrical Equipment
30300	Subcategory Report 30300	Instrumentation and Radiation Monitoring
30301	Element Report 30301-SQN	Difficulty of Obtaining Obsolete Equipment
30302	Element Report 30302-SQN	Location of Cold Leg Accumulator Level Transmitter
30303	Element Report 30303-SQN	Accuracy of Safety-Related Instrumentation
30305	Element Report 30305-SQN	Reliability and Maintenance of Radiation Monitoring Equipment
30400	Subcategory Report 30400	Cables and Conduit
30401	Element Report 30401-SQN	Procedure Problems
30402	Element Report 30402-SQN	Electrical Penetrations Breached
30403	Element Report 30403-SQN	Cable Problems in Manholes

30500	Subcategory Report 30500	Accessibility
30501	Element Report 30501-SQN	Accessibility Problems
30600	Subcategory Report 30600	Fire Protection
30601	Element Report 30601-SQN	Fire Protection Equipment Works Improperly
30700	Subcategory Report 30700	Nuclear Power Site Programs/Procedures
30701	Element Report 30701-SQN	POK-C Approval Process
30702	Element Report 30702-SQN	Handling of Safeguards Information
30704	Element Report 30704-SQN	Workplan Process
30705	Element Report 30705-SQN	Surveillance Program/Instructions
30706	Element Report 30706-SQN	Test Program/Procedures
30707	Element Report 30707-SQN	Radiological Emergency Plan
30708	Element Report 30708-SQN	Training Program for Employees
30711	Element Report 30711-SQN	Management Nonresponsiveness
30713	Element Report 30713-SQN	Configuration Control
30800	Subcategory Report 30800	Maintenance
30801	Element Report 30801-SQN	Adequacy of Procedures
30802	Element Report 30802-SQN	Preventive Maintenance
30803	Element Report 30803-SQN	Corrective Maintenance
30804	Element Report 30804-SQN	Program Deficiencies/Procedures Violations
30805	Element Report 30805-SQN	Training Program Deficiencies
30806	Element Report 30806-SQN	Subjourneyman/Journeyman
30807	Element Report 30807-SQN	Clam Control
30900	Subcategory Report 30900	Engineering
30901	Element Report 30901-SQN	Adequacy of Procedures
30905	Element Report 30905-SQN	Technical Training
31000	Subcategory Report 31000	Operations/Operational
31001	Element Report 31001-SQN	Operations Programs/Procedures Inadequate
31002	Element Report 31002-SQN	Operator Qualifications
31003	Element Report 31003-SQN	Operations Procedures Need Clarification (Rewritten and Used)
31100	Subcategory Report 31100	Health Physics
31101	Element Report 31101-SQN	Health Physics Staff Training
31102	Element Report 31102-SQN	Radioactive Material Control
31103	Element Report 31103-SQN	Exposure Limits/Records
31104	Element Report 31104-SQN	Health Physics Policy/Practices
31105	Element Report 31105-SQN	Alara
31106	Element Report 31106-SQN	Health Physics Facilities, Clothing, and Protective Equipment

31200	Subcategory Report 31200	Security
31201	Element Report 31201-SQN	Adequacy of PSO Uniform in Nuclear Plant Environment
31204	Element Report 31204-SQN	Management and Personnel Issues
31208	Element Report 31208-SQN	Security at Plant Entrances
31211	Element Report 31211-SQN	Security Design/Hardware
31300	Subcategory Report 31300	Miscellaneous
31302	Element Report 31302-SQN	Personnel Safety (Hardware)
31303	Element Report 31303-SQN	Housekeeping
31304	Element Report 31304-SQN	Environmental
31306	Element Report 31306-SQN	Questionable Concrete (Grout) Repair
31307	Element Report 31307-SQN	SNQ Insulation
31309	Element Report 31309-SQN	Plant Improvements/Suggestion

APPENDIX B

SUBCATEGORY REPORT OVERVIEWS

This appendix summarizes the findings and actions for each of the 13 subcategories in the Operations Category. The discussion includes, where applicable, examples of good performance found or areas where good performance could be inferred from the lack of problems found during evaluations of those areas. These specific examples and general areas of good performance were identified as the result of a category-wide assessment of evaluation findings conducted after all subcategory reports had been written. The information regarding good performance was collected for presentation in this report and is not necessarily clearly pointed out in the various lower level reports of this category.

Subcategory 30100. Mechanical Equipment Reliability/Design

This subcategory consists of 70 concerns that raise 44 issues about the reliability and design of mechanical equipment such as valves, diesel generators, piping, heat exchangers, steam generator manways, and plant fire doors. Twenty-one of the 44 issues either were not substantiated or were factual statements of situations that did not pose a problem requiring action. For 20 of the issues, action had been initiated by TVA management prior to the employee concerns evaluation. Three of the issues required action to be taken that had not been identified and initiated by TVA management prior to the employee concerns evaluation.

Several deficiencies were noted during the evaluation that either were or are being resolved adequately at the lowest level of the evaluation process and therefore did not require further consideration at higher reporting levels. These deficiencies were with respect to: (1) procurement control of Kerotest valves at all sites, (2) excessive vibration of a reactor feedwater pump line at Browns Ferry Nuclear Plant (BFN), (3) entering and exiting steam generator manways at Watts Bar Nuclear Plant (WBN) and Sequoyah Nuclear Plant (SQN), (4) accuracy of various system operating instructions at WBN, and (5) operability, reliability, and safety of Auxiliary Building air lock doors at WBN and SQN.

Kerotest valve specifications were revised throughout TVA to provide for better procurement controls. Prior to the ECTG evaluations, line management at the various sites had examined and refurbished previously procured valves as appropriate and had implemented a valve maintenance program. For the line vibration problem at BFN, plant management had the piping system modified and committed to monitoring the modified piping system during initial operation at the next heatup. To address the steam generator manway problem, WBN and SQN line managers had been working in close coordination and had ordered a new closure system for the steam generator manways at both sites. Inaccurate system operating instructions at WBN were revised and Auxiliary Building air lock deficiencies at WBN and SQN are being resolved through modifications.

Three findings from this subcategory were identified as most significant and were identified for further consideration in the broader scope of the category. These three subcategory level findings deal with instances of a lack of guidance, involvement, and control throughout the organization over:

- Implementation of design and construction standards and requirements into operations activities at WBN, SQN, and BFN relative to the integrity and maintenance of containment paint coatings.
- Maintenance and performance testing of diesel generators at all sites.
- Component identification at all sites resulting in (1) missing and incorrect equipment tags in the field and (2) drawing and data base deficiencies related to unique identifiers.

For the first subcategory level finding regarding containment paint coatings, the Division of Nuclear Engineering (DNE) revised the applicable construction specification to include requirements for periodic inspection and maintenance of containment paint coatings. Baseline inspections either have been completed or are in progress at the various sites to provide information for a corporate log on uncontrolled coatings. The various sites committed to revising applicable implementing instructions based on the recent revision by DNE of the construction specification. Actions are also being taken at the sites to establish formalized programs for coating maintenance and to repair deficient coatings as necessary.

For the second finding pertaining to diesel generators, the Office of Nuclear Power will develop a corporate standard providing guidance for the maintenance and performance testing of emergency diesel generators at all sites.

WBN is taking action related to diesel generator maintenance and testing in several functional areas. Mechanical maintenance personnel will accomplish the following: (1) issue a Field Change Request to direct as-designed leak off from diesel engine exhaust stacks to floor drains, (2) issue maintenance requests to repair existing diesel fuel and lubricating oil leaks, (3) write and schedule a preventive maintenance item for starting air dryers, and (4) implement a computer-based maintenance history/trending program for diesel generators as well as other plant equipment.

The Electrical Maintenance section is removing nonessential metal rimmed tags found inside one diesel generator control cabinet. Diesel generator "valid start" documentation will be revised for technical adequacy and proper implementation by Operations personnel. The DNE has made modifications to the cooling air system entering the diesel generator room to decrease dust and dirt and will be installing drip pans to collect condensate dripping from moisture separators and air dryers. The WBN Site Director is establishing a surveillance program to verify the reliability record of the diesel generators prior to fuel load.

At SQN, diesel generator control panels were cleaned of dust and grime, and preventive maintenance items were prepared to maintain equipment in a clean condition. Line management is also preparing a technical specifications change to incorporate items into the diesel generator starting and testing requirements.

BFN is evaluating its diesel generator air start systems to determine the need for installation of air dryers. The plant is also implementing a program for diesel generator reliability, including maintenance of a diesel generator start log.

Problems related to component identification are being addressed at all sites through adherence to recent DNE site-specific standards for plant component identification. Detailed and comprehensive programs either are being developed or are in progress at all sites to correct problems with tagging in the field and to revise drawings accordingly. DNE is updating corporate databases as corrections are made in the field and on drawings for the various sites.

During the investigation of mechanical equipment issues, it was noted that WBN and SQN have been coordinating efforts to identify and correct certain common mechanical problems unique to their plants. For the subcategory overall, there were 15 of 21 instances where corrective action taken prior to the employee concerns evaluations were considered adequate. Corrective maintenance was found to be adequate in both of the instances in the subcategory where it had been implemented. The Design Change Request/Engineering Change Notice process was properly used four times, and three cases of proper preoperational tests were noted.

Subcategory 30200. Electrical and Communications

This subcategory includes 21 concerns addressing 11 issues about design, construction, operation, and maintenance of electrical and communications equipment such as electrical busses, junction boxes, cable penetrations, splices, and telephones. Five of the 11 issues were found not to be substantiated. Two issues were found to be factually accurate but were not problems requiring action. For one issue, action had been taken by TVA prior to the employee concerns evaluation. Three issues were factual and presented problems for which action either has been or is being taken as a result of an employee concerns evaluation.

A deficiency regarding false ground indications was noted at SQN and was adequately resolved at the lowest level of the evaluation process. SQN had plastic tags made for mounting near applicable ground detectors. These tags provide instructions for operating and maintaining the ground detectors.

The other substantiated issues for the subcategory were identified for further consideration in the broader scope of the category. These issues dealt with problems in electrical hardware adequacy as follows:

- There was a corporate-wide lack of guidance and control over the receipt, processing, and use of Raychem products for covering cable terminations and splices and over accompanying instructions that impacted design, modification, and maintenance practices as well as the quality of application of Raychem products.
- There was a lack of control by Division of Nuclear Engineering and plant operations personnel over electrical bus operating voltages as regards design requirements, initial design, and implementation of design standards through operating procedures.

There were numerous quality-related deficiencies in procedures and practices regarding the use of Raychem products for covering cable terminations and splices. Procedures for selection and use of Raychem either were complex, were incomplete, or lacked clarity at SQN, BFN, and Bellefonte Nuclear Plant (BLN). Documentation of Raychem material control was very weak at SQN, and Raychem material traceability was difficult. SQN and BFN had numerous deficient applications of Raychem. Inconsistencies and gaps were identified in applicable construction specifications, standard drawings, and implementing instructions at BFN. Also at BFN, the vendor manual control program was inadequate in issuing updated information from revisions to the Raychem manuals. At BLN, plant instructions permitted use of vendor installation instructions and changes that were not routinely reviewed by the plant for adequacy and for impact on safety before use. There was a lack of a coordinated programmatic resolution by the Division of Nuclear Engineering for Raychem problems identified at these sites.

SQN committed to performing all of its actions prior to restart. These actions include (1) reevaluating Raychem application as part of the Environmental Qualification Program, (2) conducting training on material traceability requirements, and (3) performing reviews and revisions as appropriate on the Raychem installation instructions. Evaluations of Raychem applications will be conducted under the direction of the Division of Nuclear Engineering prior to restart.

BFN corrected weaknesses noted in design output document control and updated the training lesson plan on Raychem installation for maintenance personnel. BFN also committed to correcting several other items prior to restart, including (1) inconsistencies in acceptance criteria for Raychem splices, (2) minor errors in Raychem instructions, (3) deficient Raychem installations, and (4) the process for incorporating updated vendor information into Raychem instructions.

Operations personnel at BLN committed to ensuring that vendor instructions used to install Raychem sleeves receive the appropriate review and approval prior to use.

At WBN, the applicable plant instructions were found to provide sufficient direction for engineers and craftsmen to select and install Raychem applications properly. The instructions were found to provide a good example for the other plants to use in revising their respective procedures.

Electrical shutdown boards at all sites have been operated to varying degrees at voltages in excess of upper limits. This has created the potential for degradation of equipment, including safety-related equipment, powered from these boards. Deficiencies noted at all sites during the evaluation involved conflicting information in upper-tier documents, varying degrees of inadequate implementation of design requirements, and inadequate surveillance and operational controls to ensure that bus voltages are maintained within prescribed tolerances. There was a lack of a programmatic resolution by the Division of Nuclear Engineering for problems at all sites related to improper voltage conditions.

SQN has taken steps to establish proper design and operational controls for voltage conditions on shutdown boards prior to restart. Acceptance criteria for upper voltage limits on shutdown boards have been established based on guidance in industry standards. Studies have been conducted to establish proper transformer tap settings to step down the maximum and minimum grid voltages that feed into the shutdown boards. These actions will combine to keep shutdown board voltages within acceptable limits.

In addition, SQN has implemented a Corrective Action Plan to determine if equipment actually has been unacceptably degraded and to determine why undervoltage starts of the diesel generator have not occurred. The boards that have seen the highest voltages have been pinpointed, their maximum voltages have been calculated, and equipment most susceptible to overvoltage has been identified. A further determination of the need to replace specific equipment will be made after restart of unit 2. Any component found to have an unacceptable loss of life will be replaced before predicted failure.

WBN committed to making appropriate corrections in its upper-tier documents and implementing instructions to reflect acceptable voltage limits. The plant also committed to actions similar to those described above for SQN to determine if equipment actually has been unacceptably degraded due to overvoltage conditions.

BFN and the Division of Nuclear Engineering are coordinating efforts to assess the potential impact of overvoltage conditions.

BLN reported that accurate measurements of shutdown boards will be taken to confirm high voltage levels. The Division of Nuclear Engineering will be informed of the measurements for evaluation and determination of any needed action.

The Division of Nuclear Engineering committed through the Specifications Improvement Program to changing applicable upper-tier documents to reflect operating guidelines necessary to maintain shutdown board voltage within acceptable limits.

Subcategory 30300. Instrumentation and Radiation Monitoring

This subcategory is comprised of 16 concerns about the design, reliability, operation, maintenance, and calibration of plant instrumentation and radiation monitoring equipment. Of the 13 issues raised by the concerns, two were found not to be factually accurate and four

were factually accurate but did not require action. For two issues, action had been taken by TVA prior to the employee concerns evaluations. Evaluation of the remaining issues led to initiation of action by TVA.

Several deficiencies were noted in the subcategory that either were or are being corrected at the lowest level of the evaluation process. Instances of recurring failures of Cold Leg Accumulator and Refueling Water Storage Tank level instruments were found at WBN and SQN. Recurring failures of Target Rock Valve reed switches were also found at WBN. At WBN, SQN, and BFN, there were no maintenance instructions found for adjusting Target Rock Valve reed switches. At BFN, there was no capability to retrieve maintenance history before March 1983 for any particular plant component. There was a discrepancy between the WBN Final Safety Analysis Report and WBN Technical Specifications pertaining to minimum ice weight for calibration of ice condenser load cells. Also, not all housekeeping inspections had been performed and documented by the Office of Nuclear Power during the construction phase at WBN in accordance with TVA's Nuclear Quality Assurance Manual. Finally, problems were found at SQN with calibration of Particulate Iodine Noble Gas radiation monitors, and there was no clear distinction in the surveillance instructions between technical specification monitors and nontechnical specification monitors.

Actions are either in progress or completed for each of these problems. WBN is replacing faulty Cold Leg Accumulator and Refueling Water Storage Tank level transmitters under Design Change Requests. Appropriate procedure changes and training with respect to unclear or incorrect maintenance practices on the transmitters was also accomplished. SQN is aware of recurring problems with Refueling Water Storage Tank level transmitters and is taking action to ensure the transmitters meet technical specification requirements. This action includes verifying operability of sense line heat trace circuits, compensating for different head pressures at the transmitters, and trending transmitters' performance.

For discrepancies noted between the WBN Final Safety Analysis Report and WBN Technical Specifications on minimum ice weight, changes to the Final Safety Analysis Report were prepared to bring the report and technical specifications into agreement. Also, recent procedure revisions clarified housekeeping inspection frequencies and documentation requirements.

SQN committed to revising surveillance instructions associated with radiation monitors to clearly distinguish between non-technical specification and technical specification monitors. SQN also took action to have a factory representative for Particulate Iodine Noble Gas radiation monitors assist in correcting problems with the monitors and conduct training for instrument technicians.

The following subcategory level finding was identified for further consideration in the broader scope of the category:

- Processes have been lacking at WBN, SQN, and BFN for trending equipment performance and for subsequent root cause analyses of recurring hardware deficiencies to preclude recurrence of problems. These processes should include tracking of corrective action and follow-up to ensure that appropriate action is taken.

Corrective Action Plans from line management in response to the various problems identified in the subcategory indicate that adequate maintenance trending and maintenance history programs are now either under development or in use at WBN, SQN, and BFN.

Overall, the performance of instrument engineers and craftsmen relative to instrument maintenance activities was found to be good.

Subcategory 30400. Cables and Conduit

This subcategory consists of seven concerns raising six issues about electrical hardware deficiencies and problems with procedures related to electrical aspects of plant construction. One issue was factually accurate but did not present a problem requiring action. The remaining five issues were substantiated and required action as a result of an employee concerns evaluation.

Two of the five substantiated issues were adequately resolved at the lowest level of the evaluation process. These issues dealt with (1) controls and procedures for the use of steel fish tape for breaching electrical penetrations at WBN and SQN, and (2) the presence of loose conduit where it enters a particular cable tray at WBN. For the first issue, procedures were reviewed and revised as appropriate at both plants, and WBN also provided training for personnel involved with breaching of electrical penetrations and fire barriers. For the second issue, WBN took action to initiate the reinstallation and reinspection of a missing clamp for the cable tray conduit.

Findings raised to the category level for further analysis deal with instances of a lack of guidance, involvement, and control throughout the organization over:

- Design and maintenance activities associated with electrical manholes at all sites.
- Use of consumables at all sites.
- Design and construction standards and requirements and their use at WBN, SQN, and BFN.

For the first finding pertaining to electrical manholes at all sites, actions were developed by the Division of Nuclear Engineering and each of the sites. One set of actions dealt with the establishment of housekeeping and preventive maintenance programs for electrical

manholes at all sites. The other set of actions dealt with long-term evaluations of (1) the functional adequacy of cables found in standing water, and (2) the design of manholes to preclude recurrence of water accumulation and sump pump failures.

With respect to the first set of actions, Electrical Maintenance personnel at SQN committed to establishing a preventive maintenance program for electrical manholes. At WBN, the applicable administrative instruction will be revised to identify temporary cables installed in electrical manhole cable trays. At BFN, general cleanup of manholes will be accomplished and procedures will be written to establish regular inspections of manhole sump pumps. BLN will also add a requirement to the preventive maintenance program for periodic inspection of manholes.

With respect to the second set of actions, Electrical Maintenance personnel at SQN committed to accelerating their review of cables already underway. Division of Nuclear Engineering personnel at SQN committed to correcting manhole sump pump deficiencies and to determining the adequacy of applicable medium and low voltage power cables routed through manholes before unit 2 restart. Additionally, SQN committed to completing the following after unit 1 startup: (1) evaluating the functional adequacy of all applicable cables and splices, (2) determining the root cause of manhole flooding, and (3) determining action to prevent recurrence.

The Division of Nuclear Engineering developed a Corrective Action Plan that committed to an overall design requirements review and implementation of document verification under the Specifications Improvement Program. The issue of standing water in electrical manholes was specifically targeted for this review and verification effort.

In its response to the second finding pertaining to use of consumables, TVA disagreed with the statement that there is a lack of corporate and plant control over consumables. The response was accepted because there was only one example of loss of material traceability cited in the subcategory report. The response showed that an adequate program is defined for corporate control of consumables. However, the adequacy of the implementation of the corporate program was still questionable based on the numerous examples from other Operations subcategory reports where there was a lack of control over QA Level II items. Because these examples fell outside the scope of Subcategory 30400, however, the question of implementation of the corporate QA Level II program was not pursued further in this subcategory. It was escalated for further consideration in the overall assessment of the category.

The third finding regarding adequacy and use of upper-tier documents will be addressed as part of the Division of Nuclear Engineering's commitment to implement the Specifications Improvement Program. In this major program, design requirements will be assessed and site implementing documents will be reviewed for adequacy in meeting the requirements.

Subcategory 30500. Accessibility

This subcategory is comprised of 20 concerns which deal with the issue of difficult or limited access to systems and equipment for normal operation, maintenance, testing, and inspection. Evaluations of the concerns showed that access to various systems and equipment at all sites either was or is difficult or limited. However, for most of the concerns, previous action was found to have been taken by line management. There were no conditions identified which have an impact on the restart of SQN or BFN. Two conditions at WBN were identified by the evaluations as requiring action: (1) difficult access to auxiliary feedwater valve platforms, and (2) unsafe access in the north main steam valve rooms. WBN is preparing design change requests to address each of these two access problems.

The finding identified for further consideration in the broader scope of the category is as follows:

- There has been a lack of control over initial design activities and over modification activities relative to accessibility considerations for equipment operation, maintenance, and ALARA situations.

In its response to this finding, TVA stated that accessibility is a design input consideration and is reviewed as part of the design verification process. This review includes consideration of accessibility needed for maintenance and repair. It is anticipated that, even with appropriate procedural controls of the design process, accessibility problems will continue to occur due to changing regulatory requirements and the application of approved construction tolerances. Therefore, operations and maintenance personnel will need to continue requesting design changes to provide greater access in certain areas. Engineering changes to correct access problems are being implemented at BLN through two ongoing programs--the Accessibility Program and the Workplace Hazard Assessment Program.

There were numerous instances noted in the subcategory where current accessibility programs at WBN and SQN were identifying and fixing problems. Also, the operating records of SQN and BFN demonstrate that accessibility to systems and equipment is adequate for these plants to operate safely.

Subcategory 30600. Fire Protection

This subcategory includes 13 concerns raising nine issues about the adequacy of the design, operation, maintenance, and testing of fire protection equipment. Four of these issues were found not to be substantiated. Two issues were found to be factually accurate but were not problems requiring action. Three issues were factual and presented problems for which action either has been or is being taken as a result of an employee concerns evaluation.

Several problems were noted that were corrected at the lowest level of the evaluation process. Inconsistencies were identified between corporate upper-tier documents and between WBN site documents regarding quality assurance requirements for safety-related fire protection equipment. Deficiencies were noted in various procedures and instructions reviewed at WBN. Numerous problems were found with the design, operation, testing, and inspection of plant fire doors and their closure mechanisms at all four TVA nuclear sites.

Each of these conditions is being addressed by actions being planned or taken. A deficiency report was generated and issued to all sites to address the quality assurance inconsistencies for safety-related fire protection equipment. Applicable instructions are being revised at WBN to address inspections of fire hose station valves, weatherstripping, and fire doors. A deficiency report was issued to document a potential inconsistency between the draft WBN technical specifications and fire door inspection practices. A nonconforming condition report was written against several WBN fire doors that were not routinely inspected under a surveillance instruction. The Division of Nuclear Engineering initiated actions to clarify previous statements made to the Nuclear Regulatory Commission regarding actual action taken to resolve WBN fire door closer deficiencies.

WBN Modifications personnel will initiate an investigation of the door closers on various doors to verify that they meet design requirements. At SQN, Division of Nuclear Engineering personnel are addressing issues related to the effects of differential air pressure on the ability of fire doors to close properly. SQN Mechanical Maintenance personnel committed to determining what actual door closers are in place and to correcting drawing hardware schedules accordingly. BFN has reviewed fire doors in detail for compliance with the applicable National Fire Protection Association standard and is replacing some doors. In a design study at BLN, problems with fire door closure had been investigated, calculations had been performed, and actions had been proposed for implementation through an Engineering Change Notice.

The following finding was identified for further analysis in the category report:

- There has been a lack of control over the initial design, configuration, materials, and maintenance activities associated with fire protection systems in the TVA nuclear program.

In response to this finding, the Division of Nuclear Services has initiated a fire protection program assessment and improvement project. It will address procedure adequacy including content, implementation, and compliance with commitments as well as correction of identified deficiencies.

Also, a mechanical Design Standard has recently been established to quantify design requirements regarding fire barriers. This standard will be revised to address reasonably anticipated differential pressure conditions when specifying fire doors and related

equipment. Additionally, a Division of Nuclear Engineering policy memorandum will outline the requirements applicable to fire doors and will implement inclusion of these requirements into appropriate design input and output documents.

Subcategory 30700. Nuclear Power Site Programs/Procedures

This subcategory consists of 79 concerns addressing 50 issues about programs and procedures such as the Plant Operations Review Committee (PORC) process, handling of safeguards information, the workplan process, surveillance instructions, test procedures and programs, the radiological emergency plan, and management's implementation of these programs. Twenty-one of these issues were found not to be substantiated. Five issues were found to be factually accurate, but they were not problems requiring action. Eight issues identified a problem; however, actions for the problems were initiated before the employee concerns evaluation. Thirteen issues were factual and presented problems for which action either has been or is being taken as a result of an employee concerns evaluation. Three issues were not identified as a problem; however, as a result of the employee concerns evaluation, a problem was discovered for which action was initiated.

Several conditions were identified at the lowest level in the evaluation process as requiring action. At WBN, deficiencies noted included an isolated incident of mishandling safeguards information, insufficient coverage of emergency preparedness procedures in General Employee Training, unavailability of personnel at PORC meetings, lack of documentation for problems identified in review of workplans, instances of failure to adequately control the workplan process, less than fully adequate orientation of personnel to workplan implementing procedures, lack of testing on radiation area door status alarms and on the Auxiliary Building Secondary Containment Enclosure door interlock system, and lack of a design basis document for single failure criteria. Deficiencies were found at SQN in regard to trending of equipment failures associated with excessive testing, lack of procedures for conduit re-use, and the unawareness of system status by unit operators due to a procedural change.

At BFN, deficiencies were found with respect to use and documentation of temporary supports to piping systems. Several deficiencies were considered non-plant specific and were in regard to aspects of the program for conditions adverse to quality, status of the Nuclear Procedures System program, instances of failure to incorporate experience review program requirements in site Standard Practices, the quality control of the corporate chemistry program, and the definition of single failure criteria.

To address the isolated incident of mishandling safeguards information at WBN, the WBN Drawing and Document Control Unit has implemented a document log, and the Division of Nuclear Construction is revising the applicable Standard Operating Procedure to improve document identification. WBN will include background information on federal and regulatory criteria for emergency preparedness and on the Radiological Emergency Plan in General Employee Training. WBN procedures will be revised to clarify PORC attendance requirements and to improve PORC traceability of instruction changes. Also, the WBN

PORC will review several items and procedures which previously received illegitimate PORC review. With regard to workplan problems, the WBN Quality Improvement and site QA sections are currently reviewing conditions adverse to quality on the workplan control process. WBN Preoperational Test Staff will prepare a nonconforming condition report to document identified workplan problems which are unrelated to their current workplan review. Regarding generic applicability reviews for workplan nonconformances, future reports of conditions adverse to quality at WBN, as well as those nonconforming condition reports dated after January 1, 1985, will receive a generic applicability review.

WBN will prepare maintenance instructions or preventive maintenance procedures to address problems with lack of testing on radiation area door status alarms and on the Auxiliary Building Secondary Containment Enclosure door interlock system. Finally, the Division of Nuclear Engineering will develop single failure design criteria for WBN.

At SQN, the component failure trending program should discover repetitive or generic failure trends caused by excessive testing. The applicable instruction for conduit installation is being revised to address re-use of electrical conduit. Also, the applicable maintenance instruction will be revised to ensure unit operator awareness of system status.

To address procedural and workplan documentation inadequacies with respect to pipe supports, BFN will initiate a corrective action report and will revise a modifications procedure.

TVA also responded to problems that were considered non-plant specific. The program for conditions adverse to quality will be revised to address the sending of generic review results to the organization responsible for root cause determination. It was noted that the Nuclear Procedures System Program is currently in the development stage. Its structure was established in an Office of Nuclear Power directive approved November 5, 1986. The policy for management programs encompassed in the NPS was established in the Office of Nuclear Power Policy and Organizational Manual on December 31, 1986. The Manager of Nuclear Procedures Staff will develop the NPS program schedule. Requirements of the experience review program will be incorporated into the various plants' standard practices. Regarding the resolution of chemistry program deficiencies, a chemistry program manager's position was established at the corporate level to develop, implement, and maintain a state-of-the-art chemistry program at TVA. The program is presently under development. Finally, the Division of Nuclear Engineering will revise the Final Safety Analysis Report for BLN prior to fuel load to incorporate a definition of single failure criteria for BLN main steam isolation valves. The need for similar action at WBN will also be evaluated.

Findings identified for further analysis in the category are as follows:

- There is a lack of corporate guidance, control, and oversight of the PORC process at WBN, SQN, and BFN.

- The workplan process has not been implemented consistently at WBN, SQN, and BFN.
- There have been weaknesses in configuration control at WBN, SQN, and BFN.

The last two findings are specifically addressed in the TVA Nuclear Performance Plan. For the first finding, TVA committed to developing and implementing applicable corporate-level procedures to ensure appropriate standardized practices in the PORC process at the various sites. Actions will also be taken to reduce the extraneous PORC workload and to improve the effectiveness of corporate-level audits and oversight of PORC activities.

Numerous examples and areas of good performance were noted in this subcategory. Overall, the initial design requirements with respect to operational readiness were met. Also, proper quality assurance documentation was accessible and retrievable with minor exceptions. Line managers demonstrated good overall compliance with regulatory required items in their technical specifications once they had agreed on the best course of action to take for plant operability. In addition, surveillance instructions were adequate for implementation of surveillances required by technical specifications. Performance was found to be adequate at the corporate level and at all sites for the Radiological Emergency Plan and for the safeguards information program. The process at WBN and BLN for transferring systems responsibility from construction personnel to operations personnel was found adequate. The plant technical support functions were effective at all sites. With respect to preoperational testing and surveillances, sufficient prerequisites were generally in place and personnel performing the tests were qualified. This led to the actual conduct of preoperational testing and surveillance being good in general, although a breakdown did occur in the review of the test results to ensure compliance with acceptance criteria.

Subcategory 30800. Maintenance

This subcategory contained 76 concerns addressing 59 issues associated with plant support personnel and how they perform their tasks. The concerns were about the adequacy of procedures, plant maintenance, training, program deficiencies, and the use of unqualified personnel to perform plant work. Twenty-seven issues were found to be not factually accurate. Four issues were factually accurate but did not require action. Seventeen issues were factually accurate but the problems were being addressed before the employee concerns program evaluations. Eight issues were factual and presented problems for which action either has been or is being taken as a result of the employee concerns program. Three issues did not present a problem in themselves; however, as a result of the employee concerns evaluation, a problem was discovered for which action was initiated.

Several conditions were found to exist that required measures to be taken at the lowest level of the evaluation process. At BFN, a problem in regards to safely rigging the main steam relief valves was identified, and at BLN the lack of inspection requirements for grease hardening in Limitorque valve operators was a deficiency. Updating and proper

incorporation of vendor manuals were determined to be deficiencies at WBN and SQN. Possible deficiencies have been discovered at BLN with the BIF valves resulting from dry layup and also with shelf-life of replacement parts. Problems with fire door, containment door, and security door maintenance at BFN and potential problems with door repair at WBN were noted. The performance of crane side pulls was noted at all sites. Problems were identified at BFN for controls over the removal and re-installation of pipe supports.

Corrective Action Plans have been developed for these deficiencies noted during element evaluations. At BFN, specific procedures are being implemented and additional equipment is being installed to assist in the removal of main steam relief valves. The BLN preventive maintenance program data base will be revised to include requirements for lubricant inspection in the limit switch gears of the Limitorque valve operators. At SQN, a vendor manual program plan is being developed to identify pre-restart and post-restart items and scope and implementation schedules for the plan. WBN will correct specific vendor manual deficiencies, and the site director will coordinate with the Divisions of Nuclear Construction, Nuclear Engineering, and Nuclear Support in order to evaluate the integrated vendor manual program underway at SQN and BFN for possible implementation at WBN. BIF valve problems with seat leakage and replacement parts at BLN have been documented and are being tracked and worked. All valves which are active or which perform critical functions will be tested in accordance with their respective design function requirements before being placed in service. At WBN, seven of the most used fire doors are being replaced with a more durable type door, and a maintenance history record is being established for fire doors to identify continually recurring problems. Replacement parts are being installed for doors at BFN that are chronic problems, and a preventive maintenance program for doors is being started. With respect to crane side pulls, the Crane Consistency Program evaluating the use of cranes throughout TVA has identified side pulls as a significant part of its charter. The program's manager committed to issuing a bulletin to each site identifying the danger of side pulls. All sites either have re-emphasized by way of memorandum or have retrained their personnel on the importance of avoiding side pulls. In addition, SQN has corrected problems with crane side pulls by certifying its personnel and by establishing a long-term Corrective Action Plan to keep operators' qualifications up-to-date. BFN reported that instructions are either in place or are being developed for pipe support removal and reinstallation.

The following findings were identified for further analysis in the category:

- The overall maintenance program, including preventive, predictive, and corrective aspects, has no specific direction or overall policy to identify the goals and objectives the program should satisfy.
- The overall maintenance program has several procedural weaknesses, including (1) upper-tier requirements not always being incorporated, (2) maintenance request instructions not containing recommended step signoffs or acceptance criteria, and (3) work instructions not being technically sufficient.

- The as-constructed configuration of plant equipment does not always reflect the vendor technical manuals controlled at the plants.
- Maintenance personnel have not been adequately trained in (1) specific areas of specialized equipment or processes, and (2) how to adequately document all work performed under the maintenance program.

No Corrective Action Plans were requested for these findings at the subcategory level because they were determined to be targeted adequately by the Nuclear Performance Plan and by the Nuclear Manager Review Group's 1986 report on maintenance activities at BFN, SQN, and WBN. Actions being taken under these two documents are being kept at the proper level of management attention through current tracking systems until completion of all actions.

For the finding regarding configuration management and vendor manual control, it was determined that upper-tier documents adequately address the requirements for and use of vendor manuals. The process for implementing these requirements at all sites has led to the establishment of a new position within the Office of Nuclear Power - Manager, Vendor Manual Control. This manager is overseeing the development of appropriate plant procedures and the identification of interfaces with the Division of Nuclear Engineering for technical reviews and processes to control the use of vendor manuals and drawings.

Several areas of good performance were noted related to maintenance activities as a result of the evaluation of this subcategory. Corrective maintenance activities were found to be implemented effectively. Instrument and mechanical maintenance activities were being done well. Plant clearance programs seemed adequate. Since no evaluation identified a significant equipment problem, it was concluded that the overall condition of major installed equipment was good. Throughout the evaluations accessibility to documentation was good, particularly at BLN.

Subcategory 30900. Engineering

This subcategory consisted of 11 concerns raising 11 issues about the adequacy of engineering programs, adherence to procedures, and the adequacy of engineering training. Of the 11 issues evaluated, three issues revealed problems for which action was taken at the lowest level in the evaluation process. WBN had two potential problems in the implementation of plant specific systems training for corporate site technical support engineers. These problems were believed to be generic to SQN and BFN as well. Weaknesses were found at WBN pertaining to the potential for loss of configuration control in implementing the maintenance request process. All sites had deficiencies which allowed Teflon thread sealing tape to be used in violation of General Construction Specifications.

With respect to systems engineering training, each site director has been requested to revise his respective training procedures to include the requirement of Program Manual Procedure 0202.17, "Technical Staff and Manager Training for Nuclear Plant Site

Personnel." The Division of Nuclear Training will develop a schedule for conducting the training following restart of SQN Unit 2. The division directors of Nuclear Safety and Licensing, Nuclear Construction, Nuclear Quality Assurance, and Nuclear Engineering either have identified or will identify the personnel from their divisions who must attend the training.

With respect to implementation of the maintenance request process, it was determined that the administrative instruction is explicit in how the maintenance request process is to be conducted and that the process provides for returning equipment to normal status as required. Implementation of the administrative instruction, however, was weak. WBN committed to documenting any mistakes discovered in the process by way of a Corrective Action Report, Deviation Report, or Conditions Adverse to Quality Report when applicable.

With respect to teflon tape, SQN committed to revising procedures and to issuing a memorandum in order to clarify the restrictions on teflon tape application. WBN, BFN, and BLN were found to have already reviewed the use of teflon tape and to have restricted its use. The Division of Nuclear Engineering has been requested to revise the division procedure manual relative to teflon tape control. The Division of Nuclear Engineering is also currently negotiating a test program with Oak Ridge National Laboratory to determine acceptable thread sealant materials.

A collective assessment of the findings for this subcategory showed that the findings reflected upon plant-wide programmatic deficiencies and maintenance practices more fully addressed in Subcategory Report 30700, "Nuclear Power Site Programs/Procedures," and Subcategory Report 30800, "Maintenance." It was determined that a meaningful assessment of the findings presented in Subcategory 30900 could not be accomplished without also examining the findings in the other two subcategory reports. Therefore, no subcategory-level conclusions were made in Subcategory 30900. The findings regarding systems engineering training, the maintenance request process, and teflon tape were considered in the analysis of the overall category conducted for preparation of this category report.

The evaluations of this subcategory presented many opportunities for problems to be found in the plant technical support area. The lack of problems in the plant technical support area implied that performance in this area has been good.

Subcategory 31000. Operations/Operational

This subcategory is comprised of 57 concerns addressing 30 issues about operator training and performance and operations procedures. Twenty-two of the 30 issues were not substantiated. Three issues were factual as stated but were not problems requiring action. Four issues were substantiated, but action had already been taken prior to the employee concerns evaluation. One issue presented a problem for which action is being taken as a result of the employee concerns evaluation.

With respect to conditions adequately resolved at the lowest level in the evaluation process, at SQN the Operations Section Instruction Letters on Quality Assurance training requirements had not been reviewed for consistency. This was evidence that some periodic reviews of Section Instruction Letters were not being performed. At WBN, a Nuclear Safety Review Staff recommendation had not been fully implemented regarding training and retraining of craft/construction personnel on the plant clearance procedure. A WBN Corrective Action Report initiated in April 1985 had noted numerous equipment misalignments and deviations with respect to operational status. Finally, there was a lack of procedural controls at all sites for root valves to tygon tubing being used for temporary level indication.

SQN committed to reviewing and either revising or deleting Operations Section Instruction Letters on Quality Assurance training. WBN committed to developing and conducting training for craft/construction personnel on the plant clearance procedures. With respect to WBN operation configuration control program deficiencies noted in a Corrective Action Report, WBN stated that the deficiencies had been corrected and that actions to prevent recurrence had been taken. A surveillance will be performed before licensing as part of WBN's operational readiness verification to ensure the effectiveness of the actions to prevent recurrence. With respect to tygon tubing procedural controls, WBN had made the necessary revision to a General Operating Instruction before the current evaluation. SQN reviewed the applicable System Operating Instruction for tygon tubing and committed to revising an instruction, issuing a caution order, and reflecting proper tygon tubing controls in work requests. BFN also committed to revising a standard practice to institute proper controls on tygon tubing utilized for temporary level indication.

The only significant findings for this subcategory dealt with problems with operational procedures and with plant system status at WBN. Because these operational findings were identified at WBN, whose status is preoperational, the findings were not escalated to the category level for further analysis. During the evaluations for this subcategory, TVA's plant operators were found to be well trained. Also, adequate performance was found in several areas, including the rotation of operating shifts, shift staffing, operator conduct, the Reactor Operator selection process, and the program for independent verification of system alignment.

Subcategory 3i100. Health Physics

This subcategory contains 72 concerns about Health Physics requirements and practices. The 42 issues raised by the concerns deal with Health Physics staff training, radioactive material control, exposure limits and controls, and the various practices and equipment designed to provide radiation protection. Twenty issues were found to be not factually accurate. Six issues were factually accurate but did not require action. Eleven issues were factually accurate, but the problems were being addressed before the Employee Concerns program evaluations. Three issues were factual and presented problems for which action

either had been or is being taken as a result of the employee concerns program. Two issues did not present a problem in themselves; however, as a result of the Employee Concerns evaluation, a problem was discovered for which action was initiated.

Deficiencies at WBN were identified in regard to missing or unclear text in the Final Safety Analysis Report (FSAR), biannual feedback questionnaires for training, current status and scheduling of modifications made to steam generator platforms, Panel O-L-14 relocation, replacement of high maintenance instrumentation in high radiation areas, the installation of permanent barricades, and the new design for accumulator instrumentation. Additionally, the deficiencies found in an ALARA (as low as reasonably achievable) walkdown were identified for tracking. The possibility of using contaminated hoses for connecting breathing air manifolds to Service Air was another deficiency identified at WBN. At SQN, deficiencies that were identified included the resolution of some feedback questionnaires for training, incorrect distribution of Radiological Incident Reports, instances where Radiation Work Permits were not treated as QA documents, instances of inadequate implementation of the ALARA suggestion and preplanning programs, instances of late submittal of annual ALARA reports, inadequate maintenance of some radiological safety-related documents, and instances where damaged contamination zone clothing was reused. BFN had some deficiencies in the implementation of their ALARA suggestion program. While each of the above deficiencies was determined to be plant-specific, a deficiency found during a BFN evaluation that is not plant-specific was in regard to training requirements for Health Physics technicians qualified by ANSI N18.1.

WBN responded to the problem of missing or unclear text in the FSAR by submitting a new revision to the FSAR which will include a comprehensive FSAR verification plan to resolve any inaccuracies. In regard to the deficiency with biannual feedback questionnaires for WBN, the plant has revised the method and process of evaluating trainees by deleting the feedback form and instituting the requirement for a Training Evaluation Report. With respect to tracking the completion of the modification of steam generator platforms, WBN's closure of Engineering Change Notice 6115 will adequately address this issue. After the schedule and work for relocating panel O-L-14 is approved by the Change Control Board, an Engineering Change Notice will be initiated and implemented. Additionally, WBN's radiological controls personnel will perform ALARA reviews of all designs and modifications per instructions to minimize similar occurrences of incorrect panel placement. To track the replacement of equipment to reduce exposure during maintenance, WBN's closure of Engineering Change Notice 6005 will adequately address the issue. In regard to the scheduling and tracking of the installation of T-bar barricades on return air duct penetrations for regenerative heat exchangers, WBN's radiological controls personnel will submit a Design Change Request for approval; however, no generic evaluation will be necessary due to the limited scope of this condition. WBN also reported that, in regard to tracking the new design of accumulator instrumentation and the disposition of each deficiency in the ALARA walkdown, the closure of Design Change Request 633 and the closure of NRC Deviation 390/85-33-01 and Corporate Commitment Tracking System Item NCO-85-0257-009 will adequately address the respective issues. With respect to the possibility of using contaminated hoses for connecting breathing air manifolds to service air,

WBN has committed to use dedicated air hoses under the control of the Radiological Controls Section to connect service air to breathing air manifolds that will have different fittings on each end and that will be identified with a special sleeving material. Additionally, applicable procedures will be revised to reflect the Radiological Control Section's control of these air lines and the use of hold orders. A commitment was also made to certify correct installation of the fittings.

SQN reported that in regard to the resolution of feedback questionnaires, applicable instructions and procedures had been revised to address the in-plant phase of training or impact to training requirements. With respect to incorrect distribution of Radiological Incident Reports, report summaries will be mailed to the plant manager and to the Health Physics Staff. For problems associated with Radiation Work Permit timesheets, SQN has revised pertinent procedures to reflect the current status of classifying the timesheets as quality assurance records. Additionally, the General Employee Training course instructs workers on the required method for making corrections to quality assurance documents and the use of Radiation Work Permit timesheets. In regard to the instances of inadequate implementation of the ALARA suggestion and preplanning program, SQN had revised procedures reflecting time limitations, and will make extra efforts to respond to suggestions in a timely manner. For the problem associated with the timely submittal of annual ALARA reports, an instruction was revised to allow ample time for management review and approval before the deadline. In the case where documentation of radiologically safety-related activities are not maintained per American Nuclear Insurers (ANI) requirements, SQN responded that the activities identified are only recommendations by ANI and that dose-related records are maintained for a lifetime in accordance with their standard practice. For the problem of damaged contamination zone clothing being issued for reuse at SQN, the plant emphasized that clothing is inspected by laundry personnel and that it is the individual's responsibility to check clothing before use. SQN also stated that laundry operations are now being performed by the Radiation Control Group which would provide tighter controls for acceptability of contamination clothing.

BFN has reported in its response to the problems associated with the ALARA suggestion program that it had developed a computerized tracking system to identify the status of each ALARA suggestion. In regard to the deficiency related to the hiring of Health Physics technicians as fully qualified by ANSI N18.1 and bypassing the basic phase of training and a review/approval by the Office Training Committee, BFN reported that the TVA training program was designed for individuals hired outside TVA. However, corporate Radiological Controls personnel are preparing standards on the selection, qualification, and training of Radiological Control personnel which should remove any ambiguity in the interpretation of requirements. A Division of Nuclear Training Standard that will be replacing Program Manual Procedure 0202.12 will also be revised accordingly.

The following finding from this subcategory was identified for further analysis in the category:

- Control of the design and modification process has not been fully adequate to ensure incorporation of ALARA considerations.

Management's response to the subcategory level finding in subcategory 30500 adequately addressed the above finding.

Overall, Health Physics activities appeared to be well managed and well implemented. Specific areas of good performance included compliance with federally regulated exposure limits, Health Physics training, contamination control, and the respirator program.

Subcategory 31200. Security

This subcategory consists of 148 concerns addressing 61 issues about the adequacy of Public Safety Service uniforms, discrimination, training programs, management attitudes, security programs and procedures, entrance and badging requirements, guard tower facilities and design, and security systems and equipment. Twenty-nine of these issues could not be substantiated; twenty issues were found to be factually accurate but were not a problem requiring action. Seven issues were found to be factual and identified a problem, but actions had been initiated before the employee concerns evaluation was undertaken. Five issues were factual and presented problems for which actions have been, or are being, taken as a result of the employee concerns evaluation.

At WBN, deficiencies were found in regard to the implementation of the Security Degradation Determination/Corrective Action Request (SDD/CAR) Program and incompleteness of a design change request (DCR) in reference to the Security computer system. Deficiencies were noted at SQN with respect to security access key provisions and the follow-up of a License Event Report (LER) in reference to loss of power or memory to the computer system. At BFN, a deficiency dealt with the lack of "as-constructed" drawings for outside security lighting and incompleteness of work packages. Deficiencies dealing with inadequate adherence to the "pat-down search" acceptance criteria and inadequate performance of pat-down searches were considered non-plant specific.

In response to the instances of implementation requirements of the SDD/CAR program not being followed, WBN has reported that a procedure revision will be made to require the return of the SDD form to Public Safety Service and to identify selective routing of SDDs to the Superintendent, Operations and Technical Support (incorrectly referred to as Superintendent, Operations and Training in Subcategory Report 31200). In response to the incomplete DCR deficiency, the Division of Nuclear Engineering will assign an Engineering Change Notice to implement the DCR.

In response to deficiencies noted with security access key provisions, SQN noted that keys are available to Operations staff during emergencies. The provision of keys to fire watch personnel is not required within the scope of plant security. In response to the issue regarding follow-up of an LER, SQN noted that appropriate actions are specified in another LER.

BFN has responded to the deficiency concerning the lack of "as-constructed" drawings and incompleting workplan packages by completing the workplan package, and they will transmit as-constructed drawings to the Document Center. BFN has also committed to close all backlogged workplans before startup.

With regard to inadequate pat-down search performance, TVA responded that similar instances of inadequate pat-downs will be identified corporate-wide through an established, ongoing audit/evaluation program which involves site security managers, shift supervisors, and personnel in the NRC, the Division of Nuclear Quality Assurance, and the Nuclear Security Branch. Correction of identified instances of inadequate pat-downs will be through remedial training and/or disciplinary action. Actions to preclude recurrence will be taken as well.

Overall, the site security programs at all sites were found to be adequate. WBN, SQN, and BFN have been meeting both regulatory and industrial security requirements. BLN, which has only had to establish industrial security requirements thus far, has been adequately meeting these requirements. Of the 148 concerns in this subcategory, 130 either were not substantiated or were factual statements of situations that were not problems. All negative findings for this subcategory were adequately resolved at the lowest level in the evaluation process. No findings were identified as requiring further evaluation in the broader review of the category.

Subcategory 31300. Miscellaneous

This subcategory contains 56 concerns raising 52 issues about protection of the environment, personal safety, housekeeping practices, plant procedures, and suggestions for plant improvements. Fifteen issues were found to be not factually accurate. Five issues were factually accurate but did not require action. Six issues were factually accurate but the problems were being addressed before the employee concerns program. Twenty-three issues were factual and presented problems for which action either has been or is being taken as a result of the employee concerns program evaluations. Three issues did not present a problem in themselves; however, as a result of the employee concerns evaluation, a problem was discovered for which action was initiated.

A deficiency was noted specifically at WBN in the labeling of cleaning fluids approved for use on critical systems, structure, and components (CSSC). Also at WBN, there were errors in operator judgment and in the design of level indicators which resulted in fuel oil spills. Instances were noted at WBN, SQN, and BFN regarding inadequate construction and repair procedures for concrete repair and possible irregularities which may have resulted from these inadequacies. At BFN, nonmetallic (fiberglass) insulation had been installed in the drywell prior to the publication of Regulatory Guide 1.36 which placed restrictions on the use of such insulation. At WBN, management's response to employee suggestions was a problem.

With respect to CSSC cleaning solvents, the Division of Nuclear Engineering and WBN committed to revising the applicable Division Procedure and site instructions to require positive identification of all containers which hold approved CSSC cleaning solvents.

To preclude recurrences of fuel oil spills, WBN added a precaution to a System Operating Instruction to manually determine tank fuel oil levels before conducting fuel oil transfers. WBN also committed to forming a task group to evaluate the adequacy of the WBN computerized data systems pertaining to maintenance activities.

WBN and SQN evaluated reports of improper concrete repairs and tested repairs for compliance with appropriate procedures. Any discrepancies were reworked to bring the repairs into compliance with the correct requirements. Also at WBN and SQN, the procedures themselves were examined and brought into compliance with the applicable construction requirements.

BFN committed to determining whether non-metallic insulation installed on CSSC stainless steel piping meets the requirements of Regulatory Guide 1.36 and to replacing with qualified insulation as required.

WBN committed to addressing problems associated with the Employee Suggestions Program. Specific actions were taken on suggestions which had been inadequately addressed. Also, memorandums will be sent by the plant manager to the site director and section supervisors to identify the lack of proper tracking and follow-up on commitments.

The following broad finding was identified for consideration during the overall assessment of the category:

- There have been instances where guidance, involvement, and control over the implementation of design and construction standards and requirements into operations activities at BFN and SQN relative to concrete and grout repairs have been less than fully adequate.

In response to this finding, the Division of Nuclear Engineering reported that it had already initiated a corporate-wide Specification Improvement Program that would encompass concrete and grout repairs. This program will involve the development of master specifications and project-specific engineering requirements specifications from the existing general construction specifications. A computerized tracking system will identify site procedures that derive technical guidance from either a master specification or engineering requirements specification. In this way, when a specification is revised the corresponding procedures will be identified for revision.

APPENDIX C

OPERATIONS CATEGORY EVALUATION GROUP PROFILE

Experience Summary as of July 1, 1987

<u>Number of Personnel in Program</u>	48
<u>Education -</u>	
B.S., B.A. Degree	36
Associates Degree	4
Percentage of Personnel with Advanced Education	83%
Percentage of Personnel with B.S. Degree	75%
<u>Certifications -</u>	
SRO/RO	8
STA	3
Others	3
<u>Average Years Nuclear Experience</u>	12.6 years

OPERATIONS CATEGORY PROFILE

as of July 1, 1987

<u>NAME</u>	<u>EDUCATION</u> (degree, certification or licenses)	<u>EXPERIENCE</u> (total/nuclear) years - months	<u>COMPANY</u> (TVA/Impell)
Aycock, W. L.	B.S. (EE Technology)	6 yrs. 4 mon./Same	Impell
Ballowe, J. H.	B.S., RO	13 yrs. 6 mon./Same	Impell
Pass, R. W.	B.S. (Industrial Management) A.S. (ME) MBA, Lead Auditor Certification	18 yrs. 3 mon./Same	Impell
Eisenbase, M. K.	B.S. (ME)	10 yrs. 3 mon./Same	TVA
Elliott, W. T., Jr	A.A.S. (Civil)	8 yrs. 9 mon./Same	Impell
Franks, S. M., III	B.S. (NE)	16 yrs. 3 mon./Same	Impell
Gardner, G. D.	B.S. (NE), STA Candidate	7 yrs. 3 mon./Same	TVA
Gilmor, C. H.	B.S.E.	21 yrs. 3 mon./Same	Impell
Gunnels, R.	RO Certification	8 yrs. 10 mon./Same	Impell
Hall, D. C., Jr.	B.S. (HP, Biology)	10 yrs. 6 mon./Same	TVA
Halley, W. M.	B.S. (NE) SRO Certification	17 yrs./Same	TVA
Hooks, P.	B.A. Candidate	8 yrs. 4 mon./Same	Impell
Huskin, R.	A.S. (Nuclear Science)	16 yrs. 10 mon./Same	TVA
Huth, T. F.	B.S. (NE), STA	12 yrs./Same	TVA
Jones, R. E.	B.S. (EE)	18 yrs. 3 mon./Same	Impell
Lagergren, W. R., Jr.	B.S. (NE), MBA, STA, SRO Certification	17 yrs. 8 mon./Same	TVA
Lovett, D.	B.S. (Biology)	11 yrs. 3 mon./Same	Impell

OPERATIONS CATEGORY PROFILE

<u>Name</u>	<u>Education</u> (degree, certification or licenses)	<u>Experience</u> (total/nuclear) years - month	<u>Company</u> (TVA/Impell)
McClanahan, J.	B.S. (ME)	11 yrs. 2 mon./Same	TVA
McComb, S. T.	B.S. (Chemistry)	6 yrs. 3 mon./Same	TVA
McDonald, W. H.	General Studies - Power Distribution, SRO	10 yrs. 9 mon./Same	TVA
McVay, J. L.	B.S.(Engineering), A.A.(Engineering)	27 yrs. 3 mon./Same	Impell
Manual, J. S.	B.S. (ME), EIT	5 yrs. 3 mon./Same	Impell
Mashburn, F. C., Jr.	B.S. (NE), STA	6 yrs. 9 mon./Same	TVA
Massey, T. E.	B.S. (ME)	5 yrs. 6 mon./Same	TVA
Meers, B. Z., Jr.	B.S. (LE)	28 yrs./ 8 yrs. 3 mon.	
Michael, N. R., Jr.	B.S. (EE)	11 yrs. 3 mon./Same	TVA
Mills, W.	B.S. (ME)	5 yrs. 9 mon./Same	TVA
Minga, B. E.	B.S. (Chemistry)	11 yrs. 3 mon./Same	Impell
Muir, J. H.	B.A. Candidate RO	11 yrs. 11 mon./Same	TVA
Murphy, M. W.	B.S. Candidate SRO	13 yrs. 3 mon./Same	Impell
Neal, C.	B.S. (ME), P.E.	13 yrs. 1 mon./Same	Impell
Nixon, D.	A.B.A.	15 yrs. 3 mon./Same	TVA
Richards, J.	B.S. (NE)	1 yrs. 9 mon./Same	Impell
Shepherd, P.	B.S. (EE)	18 yrs. 3 mon./Same	TVA

OPERATIONS CATEGORY PROFILE

as of July 1, 1987

<u>Name</u>	<u>Education</u> (degree, certification or licenses)	<u>Experience</u> (total/nuclear) years - months	<u>Company</u> (TVA/Impell)
Shewbridge, E. G.	B.S. (ME), P.E.	10 yrs. /Same	Impell
Skibitsky, W. S.	B.A. (Economics), MBA, SRO	14 yrs. 3 mon./Same	Impell
Smith, D. E.	B.S. M.E. Candidate SRO	12 yrs. 3 mon./Same	Impell
Southerland, B.	B.A. (Microbiology)	5 yrs. 9 mon./Same	Impell
Stewart, D.	B.S. (Physics) RO	20 yrs. 11 mon./Same	TVA
Strodl, W. R.	B.S. (Chemistry)	13 yrs. 3 mon./Same	Impell
Stutz, M. D.	B.S. (ME)	14 yrs. 11 mon./Same	TVA
Sutt, R. J.	B.S. (Engineering), SRO	12 yrs. 3 mon./Same	Impell
Swearingen, F. R.	B.S. (CE)	17 yrs. 3 mon./Same	TVA
Thompson, D. R.	B.S. (EE)	13 yrs. 8 mon./Same	TVA
Touchstone, C. W.	B.S. (ME)	4 yrs. 8 mon./Same	TVA
Wenninger, G.	Lead Auditor Certification/ Certified Welding Inspector	29 yrs. 6 mon./ 22 yrs. 6 mon.	Impell
White, T. W.	Lead Auditor Certification	26 yrs. 3 mon./ 23 yrs. 3 mon.	Impell
Zachery, M.	A.S. (Physical Science)	6 yrs. 3 mon./Same	TVA

WILLIAM R. LAGERGREN, JR.

CHRONOLOGICAL RESUME OF NUCLEAR APPLICABLE TRAINING, EXPERIENCE AND EDUCATION

- 1967-69 Navy: Trained as Electronics Technician served aboard USS Tawasa ATF 92
- 1970-73 Navy: Trained as Reactor Operator served aboard USS Woodrow Wilson SSBN 624
- 1973-76 Texas A&M University: Earned undergraduate degree in Nuclear Engineering, worked as a Nuclear Lab Technician and Reactor Technician on AGN201 reactor
- 1976-Present Tennessee Valley Authority:
- 1976-80 Station Nuclear Engineer, participated in startup activities at Farley and North Anna Nuclear Stations; lead startup engineer, Sequoyah Unit 1; Shift Technical Advisor
- 1980-81 Engineering and Operator Instructor; developed and taught many of the systems, technical, and transient and accident analysis courses presented to Shift Technical Advisors and Licensed Operators.
- 1981-83 Supervisor PWR Engineering Unit; in addition to instructor task previously described; supervised the activities of instructors assigned to unit.
- 1983-84 Supervisor Engineering Section; responsible for PWR and BWR Training Units, Quality Assurance, Quality Control, and Nondestructive Examination Training Units and the Instructor Certification Training Unit.
- 1980-84 During this time period; earned a Masters Degree in Business Administration (Finance), earned a TVA Senior Reactor Operator Certification, Certified Sequoyah Simulator Instructor, and completed several vendor and utility courses on transient and accident analysis topics.
- 1984-85 Supervisor Financial Planning and Performance Section of the Manager of Nuclear Powers Planning Staff; responsible for developing monitoring systems, analyzing operational and financial performance and making recommendation as necessary.
- 1985-87 Employee Concerns; initially responsible for the evaluation of generic employee concerns at Sequoyah Nuclear Plant, finally responsible for the evaluation of concerns that were classified as operational in nature.
- 1987-Present Manager of Staff for Manager of Nuclear Power

STERLING M. FRANKS, III

STATEMENT OF EDUCATIONAL AND PROFESSIONAL QUALIFICATIONS

POSITION: TVA Employee Concerns - Operations Category

EDUCATION: B.S. Engineering, University of Tennessee, Chattanooga, 1974
Numerous Management and Technical Development Seminars and Workshops

EXPERIENCE:

03/86 - Present Impell Corporation, assigned to Tennessee Valley Authority, Watts Bar Nuclear Plant, Spring City, Tennessee

08/83 - 03/86 Impell Corporation assigned to Texas Utilities Generating Company, Glen Rose, Texas
Technical Support/Special Projects Supervisor for Startup program

01/79 - 08/83 Impell Corporation, assigned to Texas Utilities Generating Company, Glen Rose, Texas
Preoperational Test Group and NSSF Supervisor

05/76 - 12/78 Tennessee Valley Authority, Sequoyah Nuclear Plant, Chattanooga, Tennessee
Preoperational Test Engineer

08/75 - 04/76 Tennessee Valley Authority, Browns Ferry Nuclear Plant, Decatur, Alabama
Administrative Assistant, Fire Retest Recovery Program

01/74 - 07/75 Tennessee Valley Authority, Sequoyah Nuclear Plant, Chattanooga, Tennessee
Preoperational Test Engineer

03/71 - 12/73 Tennessee Valley Authority, Sequoyah Nuclear Plant, Chattanooga, Tennessee
Engineering Aide (Construction)

SYNOPSIS OF EXPERIENCE:

Mr. Franks is currently serving as Manager for Employee Concerns Operations Category, reporting to Mr. William R. Lagergren, Head of the Operations Category Evaluation Group of Tennessee Valley Authority. In this capacity, he is responsible for ensuring adequate investigations and evaluations and corrective actions are taken to resolve problems identified in engineering, construction and operation of all Tennessee Valley Authority nuclear facilities.

Mr. Franks has over 16 years of experience in the design, construction, testing and operation of commercial nuclear generating stations.

His experience encompasses development of various programs, operational experience reviews, management and organizational reviews; administrative procedure development and review; startup sequence planning and scheduling; construction and operations quality assurance review and development; design and licensing review; prerequisite, preoperational and initial startup test procedure and programs development and performance.

Currently, Mr. Franks is the Project Engineer, managing a composite group of Impell and TVA engineers investigating employee concerns for the operations category of the Employee Concerns Special Program. The duties consist of coordinating with TVA site managers the effective evaluation and corrective actions in assuring the resultant problems are thoroughly investigated and resolved. Additionally, he is responsible for resolution of questions and comments raised by the NRC team leaders evaluating the investigations performed.

Mr. Franks has also performed Final Safety Analysis Report reviews for compliance with Regulatory Guides, inspection and enforcement bulletins and industry codes and standards; identified and developed special studies for plant operating requirements including operations, engineering, quality assurance and maintenance support programs.

Mr. Franks gained additional experience while assigned to the assistant plant manager of a three-unit boiling water reactor during a major forced outage. His duties included administrative implementation and coordination of the fire restoration and retest program. In addition, he was cognizant engineer in charge of high pressure safety injection, control air, primary containment isolation, reactor core isolation cooling and reactor protection system testing.

Mr. Franks was responsible for the development and subsequent direction of the integrated emergency core cooling system preoperational test sequence for a major pressurized water reactor. In addition, as a system test engineer, he authored and performed numerous tests to include containment spray, chemical and volume control, rod control, rod position

indication, standby diesel generator, spent fuel pool cooling, safety injection, upper head injection, hydrogen recombiner and turbine generator control preoperational test procedures.

Mr. Franks supervised the Nuclear Steam Supply Systems Group for a pressurized water reactor startup program. His primary duties were to ensure that the NSSS startup group systems are accurately defined to facilitate construction and testing requirements; to oversee the prerequisite test program; to review and approve test acceptance criteria and to provide technical review of preoperational, acceptance, and initial startup test procedures.

Mr. Franks managed the Startup Technical Support/Special Project Groups. In this capacity, he ensures the technical adequacy of the preoperational test procedures and test data packages before presentation to the Joint Test Group, of which he was a member. Additional responsibilities include issuance of testing deferral packages for licensing negotiation. In addition, his staff provided licensing, administrative compliance reviews and technical support to the Manager, CPSES Startup for Texas Utilities Generating Company.

JAMES H. BALLOWE

EDUCATION: B.S., Athens State College
Athens, Alabama

EXPERIENCE: Mr. Ballowe has over fifteen (15) years broad experience in the construction, startup, and operation of commercial generating facilities.

Mr. Ballowe is currently Division Manager of the Operations Services Division of the Impell Corporation's Southeast Region. In this capacity, he has served as the Technical Manager for projects that include: the evaluation of the Project Controls organization, systems and practices at a nuclear construction site; the evaluation of information management systems at an operating plant; the implementation of plant work control center procedures and supporting data bases; the evaluation of major reactor vessel internals repair and cleanup processes; and the evaluation of configuration control and modification processes for a large Southeast utility. Mr. Ballowe has also served as Technical Manager for projects at major nuclear utilities that include evaluations of integrated Management Information Systems, and staffing and organizational evaluations pertaining to power plant operations, maintenance and technical services. Additionally, for almost two years Mr. Ballowe has served as a consultant to the Nuclear Overview Committee of a major utility, evaluating the management and performance of four operating units. Mr. Ballowe was also a participant in the prudency reviews for two other nuclear sites.

Prior to his assignment to the Impell Southeast Region office, Mr. Ballowe completed an assignment assisting a large midwest utility in the overall development and management of a preoperational testing program for a two unit nuclear plant.

Previously, also while with Impell, Mr. Ballowe assisted in the testing and startup program at Arkansas Nuclear One. His responsibilities included planning and scheduling activities associated with the interfaces between Engineering, Construction, Startup, and Operations, as well as the coordination of all design changes implemented prior to fuel loading. While employed by a major architect-engineer in their Plant Test and Operations Department, Mr. Ballowe was responsible for the supervision of personnel involved in the development of operational training programs for both conventional and nuclear power plants. He also was responsible for

establishing and maintaining the qualification level of test and operations engineers for both conventional and nuclear projects. Mr. Ballowe also assisted in evaluating design and construction schedule activities for impact on the startup and testing program and for performing system operational design review and test procedure reviews.

As an Operations employee for a utility, Mr. Ballowe was responsible for system procedure preparation, test execution, and data evaluation during the startup program for a three-unit nuclear plant, Browns Ferry. He also functioned as a plant operator and received a Reactor Operator's License for all three units. Mr. Ballowe also served as the utility's representative in performing the acceptance testing on a full scale training simulator.

**PROFESSIONAL
AFFILIATIONS,
SOCIETIES:**

American Society of Mechanical Engineers;
member:

- Operations and Maintenance Committee

**REGISTRATION
AND LICENSES:**

NRC Reactor Operation License No. OP 4129