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Evaluation
Report

November 1981

Sequoyah
Nuclear Plant
Tennessee Valley
Authority

Inspection - July 1981

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EVALUATION
of
SEQUOYAH NUCLEAR PLANT

Tennessee Valley Authority

November 1981

SUMMARY

INTRODUCTION

The Institute of Nuclear Power Operations (INPO) conducted its first evaluation of Tennessee Valley Authority's (TVA) Sequoyah Nuclear Plant during the weeks of July 13 and July 20, 1981. Sequoyah consists of two 1129 megawatt (electrical) Westinghouse pressurized water reactor units. It is located on the Tennessee River near Daisy, Tennessee. Unit 1 was placed in commercial operation in December 1980. Unit 2 is in preliminary operation.

PURPOSE AND SCOPE

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

The team examined station organization, training, operations, maintenance, radiological and chemistry activities, and on-site technical support. 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 its experience on best practices in the industry and written evaluation criteria furnished to the plant in advance. 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

Specific evaluation findings are in the accompanying DETAILS, and information of an administrative nature is in the ADMINISTRATIVE APPENDIX. These findings were presented at an exit meeting at the plant on July 24, 1981.

Recommendations are intended to augment TVA efforts to achieve the highest standards in its nuclear operations. In addressing these findings and recommendations, TVA should, in addition to correcting or improving specific conditions, pursue underlying causes and issues.

The excellent cooperation received from all levels of the Tennessee Valley Authority is appreciated.

E. P. Wilkinson
President

TENNESSEE VALLEY AUTHORITY

Response Summary

This evaluation has afforded TVA a perspective of Sequoyah's activities compared to INPO criteria and, consequently, the rest of the industry. TVA considers the recommendations for improvements INPO has made as objective and with basis and will take the appropriate actions to implement the accompanying recommendations in a timely manner.

TVA recognizes that the INPO findings detailed in this report were based on a comparison of Sequoyah operational practices with criteria that have been established by INPO as standards of excellence for the nuclear utility industry. In this perspective, the INPO findings do not indicate that Sequoyah is being operated in an unsafe manner but do indicate areas of plant operation in which improvements can and should be made. TVA particularly recognizes weaknesses in the areas of adherence to procedural requirements and the past tendency of plant management to become so involved with activities of an administrative nature that the experienced input of these individuals into all aspects of plant operation was diluted. TVA acknowledges the INPO recommendations as providing assistance in these areas.

The INPO recommendations have been evaluated and will be implemented as reflected in the following detailed response to specific items. Recommendations with generic significance will be implemented at other plants as appropriate. Full implementation, when achieved, will further enhance TVA's ability to operate its nuclear power plants in a safe and efficient manner.

DETAILS

This portion of the report includes the detailed findings. It is composed of six sections, one for each of the major evaluation areas. Each section is headed by a summary describing the scope of the evaluation and the overall finding in that area. The summary is followed by the specific findings, recommendations, and utility responses related to each of INPO's evaluation procedures. Items listed as Category II relate to criteria not included in INPO procedures, but generally recognized as desirable, accepted techniques of industry and management. The evaluation procedures that were used are listed in the ADMINISTRATIVE APPENDIX.

ORGANIZATION AND ADMINISTRATION

In this area, organizational objectives, organizational structure, manpower resources, administrative controls, and programs for management quality assurance, industrial safety, and equipment surveillance were evaluated.

Overall, the plant appears to be organized and administered effectively. However, areas in which improvements were recommended include organizational structure and objectives, manpower resources, administrative controls, management quality programs, and surveillance programs.

ORGANIZATIONAL OBJECTIVES

(INPO Procedure OA.1)

An evaluation was performed to determine how effectively goals and objectives are disseminated throughout the plant organization and if effective means are provided for periodic assessment of progress. Also, a review was made of the employee appraisal program.

Finding (Criteria A and B)

Recommendation

Response

ORGANIZATIONAL STRUCTURE

(INPO Procedure OA.2)

An evaluation was performed to determine how effectively the plant organization supports operations and maintenance activities. Areas reviewed included the applicability of the organizational diagram, the use of position descriptions for supervisory and professional staff positions, span of control for plant management positions, and individual workload.

Finding (Criterion A)

Recommendation

Response

MANPOWER RESOURCES

(INPO Procedure OA.3)

An evaluation was performed to determine the methods by which qualifications are established and qualified personnel are selected to fill job positions affecting plant safety and reliability. Areas reviewed included manpower planning, personnel selection process, written qualification requirements, and periodic review and revision of qualification requirements for each plant position.

Finding (Criterion D)

Recommendation

Response

ADMINISTRATIVE CONTROLS

(INPO Procedure OA.4)

An evaluation was performed to determine the effectiveness of the plant's administrative controls. Areas reviewed addressed the program for administrative controls for purpose, scope, responsibility, level of administrative action, and effectiveness.

Finding (Criterion C)

Recommendation

Response

MANAGEMENT QUALITY PROGRAMS
(INPO Procedure OA.5)

An evaluation was performed to determine the effectiveness of the quality programs to enhance safe and efficient operation. Areas reviewed included management control, approved quality assurance (QA) programs, program effectiveness, and qualifications of quality assurance personnel.

1. Finding (Criterion A)

Recommendation

Response

2. Finding (Criterion D)**Recommendation****Response**

SURVEILLANCE PROGRAM
(INPO Procedure OA.6)

An evaluation was performed to determine if an effective program exists for surveillance inspection and testing requirements. Areas of the surveillance program reviewed included completeness, acceptance criteria, results review, control of off-standard conditions, management control systems, actions to correct deficiencies, and proper use of procedures.

Finding (Category II)**Recommendation****Response**

INDUSTRIAL SAFETY
(INPO Procedure OA.7)

An evaluation was performed to determine the effectiveness of the plant safety program in providing a safe, orderly working environment. Areas reviewed included the plant safety program, management support for the program, and employee participation.

Finding

TRAINING AND QUALIFICATION

The following areas were evaluated: training organization and administration; training facilities and equipment; and training programs for licensed and non-licensed operators, shift technical advisors, instrument mechanics, electricians, and mechanical maintenance personnel. These areas were evaluated at both the Sequoyah Plant and the Nuclear Training Branch Power Operations Training Center.

Tennessee Valley Authority's overall commitment to training is demonstrated in several ways.

However, several areas need improvement, as described in the following findings:

TRAINING ORGANIZATION (INPO Procedure TQ.1)

An evaluation was performed to determine if a clearly defined training organization exists that is staffed with qualified personnel and is capable of accomplishing all assigned training tasks.

1. Finding (Criterion B)

Recommendation

Response

2. **Finding** (Criterion D)

Recommendation

Response

TRAINING ADMINISTRATION
(INPO Procedure TQ.2)

An evaluation was performed to determine if the activities necessary to develop and implement personnel training and qualification programs are accomplished in a well-defined, coordinated, and effective manner.

Finding (Criterion C)

Recommendation

Response

TRAINING FACILITIES AND EQUIPMENT
(INPO Procedure TQ.3)

An evaluation was performed to determine the adequacy of facilities, equipment, and materials available for the delivery of effective training for plant personnel.

Finding (Criteria A and D)

Recommendation

Response

NON-LICENSED OPERATOR TRAINING
(INPO Procedure TQ.4)

An evaluation was performed to determine if initial and continuing training for non-licensed operators is sufficient to develop and maintain the skills and knowledge necessary for the performance of assigned job functions.

1. **Finding** (Criterion A)

Recommendation

Response

2. Finding (Criterion H)

Recommendation

Response

3. Finding (Criterion J)

Recommendation

Response

LICENSED OPERATOR TRAINING
(INPO Procedure TQ.5)

An evaluation was performed to determine if initial training for licensed operators is sufficient to develop the skills and knowledge necessary for performance of assigned job functions.

LICENSED OPERATOR REQUALIFICATION TRAINING
(INPO Procedure TQ.6)

An evaluation was performed to determine if continuing training for licensed operators is sufficient to maintain the skills and knowledge necessary for performance of assigned job functions.

1. **Finding** (Criteria C and E)

Recommendation

Response

SHIFT TECHNICAL ADVISOR TRAINING
(INPO Procedure TQ.7)

An evaluation was performed to determine if initial and continuing training for shift technical advisors (STA) is sufficient to develop and maintain the skills and knowledge necessary for performance of assigned job functions.

1. **Finding** (Criterion C)

Recommendation

Response

2. Finding

Recommendation

Response

MAINTENANCE PERSONNEL TRAINING
(INPO Procedure TQ.8)

An evaluation was performed to determine if initial and continuing training for maintenance personnel are sufficient to develop and maintain the skills and knowledge necessary for performance of job functions.

1. Finding

Recommendation

Response

OPERATIONS

The area of operations was evaluated using current INPO criteria for performance in the areas of conduct of shift operations, organization and administration, use of procedures, tagout practices, plant status controls, facilities and equipment, and shift turnover. The department was staffed with well trained personnel. In particular, the technical knowledge of the shift engineers was impressive. However, improvements could be made in several areas, particularly conduct of shift operations, the use of procedures, and plant status controls as described in the following findings.

OPERATIONS ORGANIZATION AND ADMINISTRATION (INPO Procedure OP.1)

An evaluation was performed to determine if the operations organization provides for efficient accomplishment of required tasks. Areas reviewed included organizational structure, job descriptions, shift administrative assignments, written and oral instructions and orders, and administrative programs.

Finding

Recommendation

Response

OPERATIONS FACILITIES AND EQUIPMENT (INPO Procedure OP.2)

An evaluation was performed to determine if plant facilities and equipment are operated and maintained in a manner that ensures safe and efficient operation. Areas reviewed included equipment operability, equipment availability, effect of the working environment on safe and efficient station operation, adequacy of communication equipment, and shift station assignments.

Finding

CONDUCT OF SHIFT OPERATIONS
(INPO Procedure OP.3)

An evaluation was performed to determine if shift operations are conducted in a safe and reliable manner. Areas reviewed included operator activities, plant cleanliness and order, response to abnormal conditions, logkeeping practices, reliability of control room instrumentation, and operator awareness of plant conditions.

1. **Finding**

Recommendation

Response

2. **Finding**

Recommendation

Response

3. **Finding**

Recommendation

Response

PLANT OPERATIONS PROCEDURES
(INPO Procedure OP.4)

An evaluation was performed to determine whether procedures were properly used to conduct plant operations safely and reliably. Areas reviewed, included management policy for utilization and revision of procedures. In addition, procedures were reviewed for clarity, availability, continuity, identification of "sequence required" actions, and suitable advisory information.

1. **Finding (Criterion A)**

The policy defining the use of procedures is not sufficiently comprehensive to provide adequate guidance to users of procedures.

Recommendation

Response

2. **Finding**

Recommendation

Response

PLANT STATUS CONTROLS
(INPO Procedure OP.5)

An evaluation was performed to determine if plant status controls ensure adequate equipment and system availability. Areas reviewed included management programs and policies that provide guidance for status control; actual practices in status control; responsibilities of senior licensed operators assigned to monitor and review status control; and provisions for status control under special conditions such as outages, accident recovery, and refueling.

1. Finding

Recommendation

Response

2. Finding (Category II)

Recommendation

Response

SHIFT TURNOVER
(INPO Procedure OP.6)

An evaluation was performed to determine if a continuous, correct understanding of plant conditions is maintained by all shift positions. Areas reviewed included programs and policies for controlling turnover practices for shift stations, checklists, operating panel reviews, and review of plant activities in progress or planned.

Finding

TAGOUT PRACTICES
(INPO Procedure OP.7)

An evaluation was performed to determine if established tagout practices ensure protection for personnel and plant equipment. Areas reviewed included senior reactor operator (SRO) approval of safety-related tagouts, double verification of tagged equipment for personnel safety, double verification of important manual valves that are repositioned during maintenance or test, tag coloring and numbering, and clearance logs.

1. **Finding (Criterion A)**

Recommendation

Response

2. **Finding**

Recommendation

Response

MAINTENANCE

The evaluation included the maintenance organization, preventive maintenance program, work control system, maintenance history, control and calibration of test equipment, procedures, facilities and equipment, and control of special processes.

The maintenance organization is responsive to immediate problems and short-term goals. However, significant management effort is needed to improve the long-term maintenance effort. Specific areas for consideration are presented in the following findings.

MAINTENANCE ORGANIZATION AND ADMINISTRATION

(INPO Procedure MA.1)

The maintenance organization and administrative programs were evaluated to determine their effectiveness in supporting safe plant operations. Areas reviewed included the organization structure, staff size, assignment of authorities and responsibilities, training, and certain administrative programs.

Finding (Criterion D)

Recommendation

Response

MAINTENANCE FACILITIES AND EQUIPMENT
(INPO Procedure MA.2)

The location, size, and condition of offices, work, and storage spaces were examined. In addition, the number, type, condition, and location of maintenance tools and equipment were reviewed.

Finding

WORK CONTROL SYSTEM
(INPO Procedure MA.3)

The effectiveness of the work control system was evaluated. The system functions were checked to see if they promote adequate identification of potential work; define and authorize work to be performed by the maintenance groups; provide for planning, scheduling, and control of actual work; and have a mechanism to input the maintenance results into an equipment history file for future evaluation.

Finding (Category II)

Recommendation

Response

MAINTENANCE PROCEDURES
(INPO Procedure MA.4)

The team evaluated the degree to which procedures enhance the quality and effectiveness of maintenance activities. Procedures and manuals were examined to determine the types of maintenance covered, scope, level of detail, review and approval process, document control requirements, and methods of revision.

Finding

MAINTENANCE HISTORY
(INPO Procedure MA.5)

The ability of maintenance history records to support maintenance was reviewed. Areas covered were the equipment included in maintenance history, content and accessibility of records, history review and evaluation methods, and procedures for program implementation.

Finding

PREVENTIVE MAINTENANCE
(INPO Procedure MA.6)

The team evaluated the effectiveness of maintenance in optimizing equipment reliability and performance. The preventive maintenance program was assessed to determine if it was well defined and effectively implemented. Other areas of review included criteria used to determine the equipment to be included in the program, frequency of maintenance, effectiveness of program control and coordination, and adequacy of individual procedures.

1. Finding (Criterion C)**Recommendation****Response****2. Finding (Criterion D)****Recommendation****Response**

3. Finding (Criterion G)

Recommendation

Response

4. Finding (Category II)

Recommendation

Response

CONTROL OF MEASUREMENT AND TEST EQUIPMENT

(INPO Procedure MA.7)

The team evaluated the adequacy and effectiveness of methods used for calibration and control of test equipment and instrumentation. Specifically, methods used for identifying, calibrating, storing, issuing, transporting, and using measurement and test equipment were examined. Procedures establishing and governing the calibration program and existing calibration records were also reviewed.

Finding (Criterion C)

Recommendation

Response

CONTROL OF SPECIAL PROCESSES
(INPO Procedure MA.8)

The qualification and control of personnel, procedures, equipment, and material were evaluated to ensure the quality of welding processes.

Finding (Criterion D)

Recommendation

Response

RADIATION PROTECTION AND CHEMISTRY

Radiation Protection and Chemistry were evaluated by reviewing performance in radiological protection training, personnel dosimetry, external and internal radiation exposure, radioactive contamination control, chemistry, solid radioactive waste, transportation of radioactive material, and management of radiological protection. This portion of the evaluation was primarily an examination of programs as they function under normal conditions early in the life of the plant.

A number of good practices were observed in radiological protection and chemistry. These practices included the use of supervisory radiological protection personnel on backshifts, the training of radiological protection technicians, the calibration program for chemistry instrumentation, and the control of chemical reagents. Several areas require improvement, and they are described in the following findings.

MANAGEMENT OF RADIOLOGICAL PROTECTION

(INPO Procedure RC.1)

An evaluation was performed to determine the effectiveness of the management of radiological protection.

Finding

RADIOLOGICAL PROTECTION TRAINING

(INPO Procedure RC.2)

An evaluation was performed to determine if personnel on site have the knowledge and practical abilities necessary to effectively implement radiological protection practices.

Finding

PERSONNEL DOSIMETRY

(INPO Procedure RC.3)

An evaluation was performed to determine if personnel radiation exposures were accurately determined and recorded.

1. Finding (Criterion B)

Recommendation

Response

2. Finding (C

Recommendation

Response

EXTERNAL RADIATION EXPOSURE

(INPO Procedure RC.4)

An evaluation was performed to determine if the plant was minimizing external radiation exposure to personnel.

Finding (Criterion A)

Recommendation

Response

INTERNAL RADIATION EXPOSURE

(INPO Procedure RC.5)

This area was evaluated to determine if internal exposure was being minimized.

Finding

RADIOACTIVE EFFLUENTS

(INPO Procedure RC.6)

This area was evaluated to determine if releases of radioactive effluents to the environment were being minimized.

1. Finding (Criterion A)

Recommendation

Response

2. Finding (Criterion C)

Recommendation

Response

SOLID RADIOACTIVE WASTE
(INPO Procedure RC.7)

This area was evaluated to determine if the station was minimizing the generation of solid radioactive waste.

Finding (Criteria A, D, and F)

Recommendation

Response

TRANSPORTATION OF RADIOACTIVE MATERIAL
(INPO Procedure RC.8)

This area was evaluated to determine if the plant is meeting requirements for the transportation of radioactive material.

Finding

RADIOACTIVE CONTAMINATION CONTROL
(INPO Procedure RC.9)

This area was evaluated to determine if the plant was minimizing the contamination of equipment, areas of the plant, and personnel.

Finding (Criterion A)

Recommendation

Response

CHEMISTRY
(INPO Procedure RC.10)

This area was evaluated to determine if chemistry parameters are accurately measured and effectively controlled.

1. **Finding** (Criterion D)

Recommendation

Response

2. **Finding** (Category II)

Recommendation

Response

3. Finding (Category II)

Recommendation

Response



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TECHNICAL SUPPORT

The on-site technical support was evaluated in the areas of organization and administration, plant efficiency and reliability, nuclear operating experience evaluation, plant modifications, and reactor engineering.

ON-SITE TECHNICAL SUPPORT ORGANIZATION AND ADMINISTRATION
(INPO Procedure TS.1)

An evaluation was performed to determine if on-site technical support is effectively organized and adequately staffed. The capability to perform all assigned duties, responsibilities, and training to enhance engineering skills were examined. Determinations were made as follows:

Finding (Criterion C)

Recommendation

Response

PLANT EFFICIENCY AND RELIABILITY
(INPO Procedure TS.2)

An evaluation was performed to determine if an on-site program exists to optimize plant thermal efficiency and reliability by monitoring plant performance routinely and collecting and analyzing pertinent data. Determinations were made as follows:

Finding (Reference Criteria A, C, D, and E)

Recommendation

Response

NUCLEAR OPERATING EXPERIENCE EVALUATION PROGRAM
(INPO Procedure TS.3)

An evaluation was made of the current program for evaluating in-house operating events as well as those occurring throughout the nuclear power industry. The reporting, review, and follow-up of corrective actions for in-house events as well as the method for disseminating the information to the appropriate plant personnel and the industry were examined. For industry events, examination was made of the sources of reviewed information, of the screening and classification process, of status of actions taken on recommendations from outside sources, and of the disposition of events relevant to the plant. Determinations were made as follows:

1. Finding (Criterion A)

Recommendation

Response

2. Finding (Criterion C)

Recommendation

Response

3. Finding

Re

Response

4. Finding

Recommendation

Response

PLANT MODIFICATIONS

(INPO Procedure TS.4)

An evaluation was made of the plant design change process, including temporary alterations, to determine if design changes are being implemented in a safe and timely manner. Determinations were made as follows:

1. **Finding** (Criteria A, D, and F)

Recommendation

Response

2. Finding (Cr:

Recommendation

Response

3. Finding (Criterion J)

Recommendation

Response

ON-SITE REACTOR ENGINEERING
(INPO Procedure TS.5)

An evaluation of reactor engineering was made to assess the use of appropriate procedures, computer programs, and control of changes to them and to assess the quality and adequacy of the support functions provided by the on-site reactor engineers during all modes of plant operation.

Finding

ADMINISTRATIVE APPENDIX

I. LISTING OF AREAS EVALUATED

ORGANIZATION AND ADMINISTRATION

- OA.1 Organizational Objectives
- OA.2 Organizational Structure
- OA.3 Manpower Resources
- OA.4 Administrative Controls
- OA.5 Management Quality Programs
- OA.6 Surveillance Program
- OA.7 Industrial Safety

TRAINING AND QUALIFICATION

- TQ.1 Training Organization
- TQ.2 Training Administration
- TQ.3 Training Facilities and Equipment
- TQ.4 Non-licensed Operator Training
- TQ.5 Licensed Operator Training
- TQ.6 Licensed Operator Requalification Training
- TQ.7 Shift Technical Advisor Training
- TQ.8 Maintenance Personnel Training

OPERATIONS

- OP.1 Operations Organization and Administration
- OP.2 Operations Facilities and Equipment
- OP.3 Conduct of Shift Operations
- OP.4 Plant Operations Procedures
- OP.5 Plant Status Controls
- OP.6 Shift Turnover
- OP.7 Tagout Practices

MAINTENANCE

- MA.1 Maintenance Organization and Administration
- MA.2 Maintenance Facilities and Equipment
- MA.3 Work Control System
- MA.4 Maintenance Procedures
- MA.5 Maintenance History
- MA.6 Preventive Maintenance
- MA.7 Control of Measurement and Test Equipment
- MA.8 Control of Special Processes

RADIATION PROTECTION AND CHEMISTRY

- RC.1 Management of Radiological Protection
- RC.2 Radiological Protection Training
- RC.3 Personnel Dosimetry
- RC.4 External Radiation Exposure
- RC.5 Internal Radiation Exposure
- RC.6 Radioactive Effluents
- RC.7 Solid Radioactive Waste
- RC.8 Transportation of Radioactive Material
- RC.9 Radioactive Contamination Control
- RC.10 Chemistry

TECHNICAL SUPPORT

- TS.1 On-site Technical Support Organization and Administration
- TS.2 Plant Efficiency and Reliability
- TS.3 Nuclear Operating Experience Evaluation Program
- TS.4 Plant Modifications
- TS.5 On-site Reactor Engineering

II. TENNESSEE VALLEY AUTHORITY CORPORATE AND STATION
PERSONNEL CONTACTED

Manager of Power
Director of Nuclear Power
Assistant Director, Nuclear Power
Plant Superintendent
Manager, Power Operations
Quality Assurance Manager - Power
Quality Assurance Manager
Nuclear Operations Coordinator
Radiological Hygiene Nuclear Plant Coordinator
Assistant Plant Superintendent (Operations)
Deputy Manager of Power
Assistant Plant Superintendent (3)
Compliance Supervisor
Director - Nuclear Safety Review Staff
Chief, Field Quality Assurance Staff and Member: Nuclear Safety Review
Board Chief, Operation Section, Nuclear Safety Review Staff
Assistant To Director of Nuclear Power
Shift Engineer (Senior Reactor Operator)
Shift Engineer
Mechanical Maintenance Supervisor
Maintenance Engineer
Assistant Maintenance Supervisor - Special Projects
Electrical Maintenance Supervisor
Instrumentation and Control Maintenance Supervisor
Instrumentation and Control Maintenance Planner
Engineering Aide
Mechanics Foreman
Power Stores Supervisor
Plant Services
Plant Training Officer
Operations Supervisor
Assistant Unit Operator Instructor
Training Shift Engineer
Supervisor - Nuclear Engineering Group
Reactor Engineer
Instrument Maintenance Supervisor
Assistant Operations Supervisor
Assistant Shift Engineer
Unit Operator
Assistant Unit Operator
Engineering Supervisor
Reactor Engineering Unit Supervisor
Shift Technical Advisor
Technical Engineer - Results Unit
Nuclear Experience Review Panel (NERP) - Secretary
Reactor Engineer Branch Supervisor
Reactor Engineer Branch Engineer
Administrative Analyst
Assistant Director - Operations (Acting)
NOTEPAD Coordinator

II. TENNESSEE VALLEY AUTHORITY CORPORATE AND STATION
PERSONNEL CONTACTED (Cont'd)

Compliance Unit Supervisor (on-site)
Auxiliary Unit Operator
Plant Modifications Coordinator
Document Control Supervisor
Assistant Operations Engineer
Control Panel Reactor Operator
Shift Engineer (Operations)
Supervisor, Radiation Control Unit
Radiation Control Technician
Engineering and Safety Supervisor
Chemical Unit Engineer
Chemical Unit Supervisor
Operator
Chemical Technician
Health Physics Trainer
Chemical Unit Engineer
Chemical Unit Supervisor
Operator
Chemical Technician
Management Services Supervisor
Plant Records Supervisor
Nuclear Engineer
Administrative Officer
Personnel Officer
Quality Assurance Engineer

RADIOLOGICAL PROTECTION

RADIOLOGICAL PROTECTION ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Radiological protection organization and administration should ensure effective implementation and control of radiological protection activities.

Finding (RP.1-1)

Recommendation

Response

Finding (RP.1-2)

Recommendation

EXTERNAL RADIATION EXPOSURE

PERFORMANCE OBJECTIVE: External radiation exposure controls should minimize personnel radiation exposure.

Finding (RP.4-1)

INTERNAL RADIATION EXPOSURE

PERFORMANCE OBJECTIVE: Internal radiation exposure controls should minimize internal exposures.

Finding (RP.5-1)

Recommendation

Response

RADIOLOGICAL PROTECTION INSTRUMENTATION AND EQUIPMENT

PERFORMANCE OBJECTIVE: Instrumentation and equipment used to obtain measurements of radioactivity should be calibrated, used, and maintained so that results are accurately determined.

Finding (RP.6-1)

Recommendation

Response

SOLID RADIOACTIVE WASTE

PERFORMANCE OBJECTIVE: Solid radioactive waste controls should minimize the volume of radioactive waste and ensure safe transportation of radioactive material.

Finding (RP.7-1)

Recommendation

- Response

PERSONNEL DOSIMETRY

PERFORMANCE OBJECTIVE: The personnel dosimetry program should ensure that radiation exposures are accurately determined and recorded.

Finding (RP.8-1)

Recommendation

Response

RADIOACTIVE CONTAMINATION CONTROL

PERFORMANCE OBJECTIVE: Radioactive contamination controls should minimize the contamination of areas, equipment, and personnel.

Finding (RP.9-1)

Recommendation

Response

- Funding (RP.9-2)

- Recommendation

- Response

CHEMISTRY

CHEMISTRY ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Chemistry organization and administration should ensure effective control and implementation of chemistry activities.

Finding (CY.1-1)

Recommendation

Response

Finding (CY.1-2)

- Recommendation

- Response

Finding (CY.1-3)

Recommendation

Response

~~N.C. M.../E~~

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Evaluation Report

July, 1981

Palisades Nuclear Plant Consumers Power Company

Inspection - April 1981



8/16/81

EVALUATION
of
PALISADES NUCLEAR PLANT

Consumers Power Company

July 1981

SUMMARY

INTRODUCTION

The Institute of Nuclear Power Operations (INPO) conducted its first evaluation of Consumers Power Company's Palisades Nuclear Plant during the weeks of March 30 and April 6, 1981. Palisades Nuclear Plant consists of one 700 megawatt (net electrical) Combustion Engineering pressurized water reactor plant. The site is located on the eastern shore of Lake Michigan five miles south of South Haven, Michigan. The plant was placed in commercial operation in December 1971, achieving full power in March 1973.

PURPOSE AND SCOPE

INPO conducted an evaluation of site activities to make an overall determination of plant operating safety, to evaluate management systems and controls and to identify areas needing improvement.

The evaluation was based on INPO experience of best practices within the industry and written evaluation criteria furnished to the plant in advance. Information was assembled from discussions, interviews, observations and reviews of plant documents. Emergency preparedness was not included in the scope of the evaluation, nor were corporate activities, except training, which recently became a corporate function.

The evaluation team examined station organization, training, operations, maintenance, radiological and chemistry activities and site technical support. Since evaluations were based on best practices, the recommendations made are not limited to minimum safety requirements.

DETERMINATION

The evaluation team appreciates the excellent cooperation received from all levels of the Consumers Power Company. Palisades Nuclear Plant personnel were prompt and courteous in responding to our requests and dedicated many hours and personnel solely for this evaluation.

E. P. Wilkinson
President

Consumers Power Company

Response Summary

Consumers Power Company concurs with INPO's conclusion that the Palisades Plant "... is being safely operated." Consumers also recognizes there are areas for improvement and the Company is committed to meeting, or exceeding, INPO's recommendations to ensure excellence of plant operations. There are several broad areas of improvement that will have the greatest impact on addressing most of the findings.

Specific implementation dates have been established wherever possible. Consumers will continue to welcome follow-up INPO evaluations to assess program implementation and effectiveness.

DETAILS

This portion of the report includes the detailed findings. It is composed of six sections, one for each of the major evaluation areas. Each section is headed by a summary describing the scope of the evaluation and the overall finding in that area. The summary is followed by the specific findings, recommendations and utility responses related to each of INPO's evaluation procedures. Items which relate to criteria that have not been included in INPO procedures but which are generally recognized as desirable, accepted techniques of industry and management are listed as General Criterion. The evaluation procedures that were used are listed in the ADMINISTRATIVE APPENDIX.

ORGANIZATION AND ADMINISTRATION

In this area, the organizational structure, personnel qualifications, administrative controls, management goals and objectives, quality assurance, industrial safety and equipment surveillance were evaluated.

Major strengths in this area are the well-defined goals and objectives provided by the general office to the plant. At the plant the goals and objectives are published and their progress monitored by the general manager and the department heads.

The dedication to industrial safety by the corporate office and plant staff is reflected in the effective plant safety program and record. Some areas in the Organization and Administration area do not meet the INPO criteria, as noted in the following findings.

OBJECTIVES

(INPO Procedure OA-101, Revision 1)

The evaluation team examined the methods used to establish and publish management objectives as well as how attainment of the objectives is monitored. The objectives were examined to determine if they provide substantive guidance to managers and supervisors and support the plant and overall company objectives. The degree to which the objectives are used to guide day-to-day activities was also reviewed.

Finding

ORGANIZATION STRUCTURE

(INPO Procedure OA-102, Revision 2)

An evaluation was performed to determine how effectively the organization, as structured, provides for management of the station to ensure safe, efficient operation. Areas reviewed included applicability of the organizational structure

diagrams, position descriptions for all station personnel, personnel performance evaluations, supervisors' authority, assignment of backup personnel for key positions and staffing levels.

1. Finding (Ref. Criterion A)

Recommendation

Response

2. Finding (Ref. Criteria B and C)

Recommendation

Response

ADMINISTRATIVE CONTROLS
(INPO Procedure OA-103, Revision 1)

The station administrative procedures were examined to determine if clearly defined controls are in effect and if adherence to these controls is maintained.

Finding (Ref. Criterion E)

Recommendation

Response

QUALITY PROGRAMS
(INPO Procedure OA-104, Revision 4)

The quality assurance (QA) program was reviewed to determine if an approved program is in place that covers all aspects of plant operations, the program is adequately staffed and the organizational relationships ensure the independence of the QA staff.

Finding (Ref. Criterion B)

Recommendation

Response

INDUSTRIAL SAFETY

(INPO Procedure OA-106, Revision 1)

The team examined the industrial safety program to determine if management is clearly committed to industrial safety, the program is supported at all levels of the plant staff and the program is effective in minimizing safety hazards and accidents.

Finding

SURVEILLANCE PROGRAM

(INPO Procedure OA-107, Revision 1)

The team examined the surveillance program to determine if adequate procedures, including acceptance criteria, are in use. They also evaluated the methods used to schedule surveillance tests, control operations so that safety is not adversely affected during testing and identify and resolve deficient conditions found.

Finding

PERSONNEL QUALIFICATIONS

(INPO Procedure OA-108, Revision 1)

An evaluation was performed to determine if a program exists for providing appropriately qualified personnel to operate and maintain the plant. Areas reviewed included the application of job and task analysis to each station position, the program for personnel selection and promotion and the program for periodic review of job and task analysis.

Finding (Ref. Criterion A)

TRAINING AND QUALIFICATION

In this area, the team evaluated the training organization, administration of training programs, training resources and training effectiveness. Training programs for the following job classifications were also evaluated: licensed operators, non-licensed operators, shift technical advisors, mechanical and electrical maintenance personnel and instrumentation and control (I&C) technicians. Positive features noted were that the facility has established a committee to determine the training needs of the plant staff and the corporate training section has recognized the necessity of having an effective training organization at Palisades Nuclear Plant. However, there are conditions where opportunities for improvement exist regarding training administration policy and procedures, training resources, training for plant staff other than licensed operators and evaluation of training effectiveness.

TRAINING ORGANIZATION AND ADMINISTRATION

(INPO Procedure TQ-211, Revision 2)

The team examined the on-site training organization and the administrative guidance used by the organization to develop, implement and evaluate training activities and programs used for the qualification of plant personnel.

1. Finding

Recommendation

Response

2. Finding

3. Finding

Recommendation

Response

4. Finding

Recommendation

Response

TRAINING RESOURCES

(INPO Procedure TQ-221, Revision 2)

The team examined the training facilities, equipment and materials available to support training programs for plant personnel.

1. Finding

Recommendation

Response

TRAINING EFFECTIVENESS

(INPO Procedure TQ-231, Revision 2)

The team examined plant management and training organization practices relating to the evaluation of training program effectiveness, the audit of training activities and the evaluation of instructor and trainee performance in training programs.

1. Finding (Ref. Criterion A)

Recommendation

Response

NON-LICENSED OPERATOR TRAINING

(INPO Procedure TQ-242, Revision 2)

The team examined the training program and training practices used to initially qualify non-licensed operator candidates and to maintain and improve the qualifications of existing non-licensed operators.

1. Finding

Recommendation

Response

LICENSED OPERATOR TRAINING
(INPO Procedure TQ-243, Revision 2)

The team examined the training program and practices used to initially qualify license candidates.

Finding

LICENSED OPERATOR REQUALIFICATION TRAINING
(INPO Procedure TQ-244, Revision 2)

The team examined the requalification programs and training practices used to maintain and improve the qualifications of licensed personnel.

Finding (Ref. Criterion G)

Recommendation

Response

SHIFT TECHNICAL ADVISOR TRAINING
(INPO Procedure TQ-245, Revision 1)

The team examined the qualification program and training practices used to qualify shift technical advisor (STA) candidates and to maintain and improve the qualifications of the STA.

Finding (Ref. Criterion D)

Recommendation

Response

OPERATIONS

The area of Operations was evaluated using current INPO criteria for performance in shift conduct, organization and administration, use of procedures, tagout practices, plant status controls, facilities and equipment and shift turnover.

The team found that the plant is generally clean, control room access is well controlled and the use of fixed maintenance tagouts is an efficient method of performing switching and tagging orders.

It was noted that improvements could be made in the areas of conduct of shift operations, tagout practices, organization and administration, plant status controls and shift turnover. These improvements are discussed in detail as follows.

CONDUCT OF SHIFT OPERATIONS

(INPO Procedure OP-301, Revision 2)

An evaluation was performed to determine the effectiveness of shift operations in maintaining quality shift performance. Areas reviewed included operator activities, station cleanliness and order, response to abnormal conditions, log-keeping practices, control room instrumentation reliability and operator awareness of plant conditions.

Finding (Ref. Criterion C)

Recommendation

Response

TAGOUT PRACTICES

(INPO Procedure OP-302, Revision 2)

An evaluation was performed to determine if established tagout practices ensure protection for personnel and station equipment. Areas reviewed included senior reactor operator (SRO) approval of safety-related tagouts, double verification of tagged equipment for personnel safety, double verification of important manual valves when repositioned, tag coloring and numbering and review of clearance logs.

Finding (Ref. Criterion G)

Recommendation

Response

OPERATIONS ORGANIZATION AND ADMINISTRATION
(INPO Procedure OP-303, Revision 2)

An evaluation was performed to determine the existence of a clearly defined operations organization that provides for assignment of responsibilities and delegation of adequate authority for accomplishment of required tasks. Areas reviewed included organizational structure, job descriptions, shift administrative assignments, written and oral instructions and orders and miscellaneous administrative programs.

Finding

Recommendation

Response

USE OF PROCEDURES
(INPO Procedure OP-304, Revision 2)

An evaluation was performed to determine proper use of procedures for the safe and reliable conduct of plant operations. Areas reviewed included management policies for use and change of procedures (short-term and long-term). In addition, procedures were reviewed for clarity, continuity, identification of "sequence required" actions and suitable advisory information.

Finding

PLANT STATUS CONTROL
(INPO Procedure OP-305, Revision 1)

An evaluation was performed to determine that plant status controls are provided to ensure adequate equipment and system availability. Areas reviewed included management programs or policies that provide guidance for status control, actual practices in status control, responsibilities of senior licensed operators assigned to monitor and review status control and provisions for status control under special conditions such as outages, accident recovery or refueling.

Finding

OPERATIONS FACILITIES AND EQUIPMENT
(INPO Procedure OP-306, Revision 2)

An evaluation was performed to determine if plant facilities and equipment are operable and maintained in a manner that ensures safe and efficient operation. Areas reviewed included equipment operability, equipment availability program(s), working environment, adequacy of communication equipment and watch station assignments.

Finding

SHIFT TURNOVER

(INPO Procedure OP-309, Revision 2)

An evaluation was performed to ensure continuous, correct understanding of station conditions is maintained at all shift positions. Areas reviewed included programs and policies controlling turnover practices for watch stations, checklists, operating panel reviews and station activities in progress or planned.

Pinding (Ref. Criterion B)

Recommendation

Response

MAINTENANCE

The maintenance organization, preventive maintenance programs, maintenance procedures, maintenance history and administrative systems for controlling and documenting maintenance work and special processes were evaluated. The methods used to control test equipment were reviewed, and the overall adequacy of the maintenance facilities and equipment was assessed.

MAINTENANCE ORGANIZATION AND ADMINISTRATION

(INPO Procedure MA-401, Revision 2)

An evaluation of this area was performed to assess how effectively the maintenance administrative programs and organization contribute to the performance of maintenance tasks. Areas reviewed included organizational structure, reporting requirements and practices, staff size, training and certain administrative programs.

1. Finding

Recommendation

Response

2. Finding (Ref. Criterion G)

Recommendation

Response

PREVENTIVE MAINTENANCE

(INPO Procedure MA-402, Revision 1)

The evaluation of this area was performed to determine the effectiveness of the maintenance effort to optimize equipment reliability and performance. Preventive maintenance (PM) programs and activities were assessed to determine if they are well defined and effectively implemented. A part of the review was equipment included in the program, type and frequency of preventive maintenance and effectiveness of program control and coordination.

1. Finding

Recommendation

Response

2. Finding

Recommendation

Response

3. Finding (

Recommendation

Response

4. Finding

Recommendation

Response

MAINTENANCE PROCEDURES

(INPO Procedure MA-403, Revision 2)

This performance area was evaluated to assess the adequacy of maintenance procedures and the extent to which procedures are used. Procedures and manuals were examined to determine the types of activities covered, scope, level of detail, review and approval process, document control requirements and methods of revision.

1. Finding

Recommendation

Response

2. Finding

Recommendation

Response

WORK CONTROL SYSTEM
(INPO Procedure MA-404, Revision 1)

An evaluation was performed to determine the effectiveness of the work control system in use. The system functions were checked to see if they define and authorize work to be performed by the maintenance groups; provide for planning, scheduling, and control of actual work; and have a mechanism to input the maintenance results into an equipment history file for future evaluation.

Finding

Recommendation

Response

MAINTENANCE HISTORY

(INPO Procedure MA-405, Revision 2)

An evaluation of this area was performed to assess the capability of maintenance history records to support evaluations of equipment performance. The review also checked for implementation of an evaluation program that contributes to improved equipment performance. Areas reviewed included an assessment of equipment items included in maintenance history, content and accessibility of records, history review and evaluation methods and procedures for program implementation.

1. Finding

Recommendation

Response

2. Finding

Recommendation

Response

3. Finding

Recommendation

Response

**CONTROL AND CALIBRATION OF TEST EQUIPMENT
AND INSTRUMENTATION**

(INPO Procedure MA-406, Revision 1)

A review was made to determine the adequacy and effectiveness of methods used for calibration and control of test equipment and instrumentation. Specifically, methods used for identifying, calibrating, storing, issuing, transporting and using measuring and test equipment were examined. Procedures establishing and governing the calibration program and records were also reviewed.

1. Finding

Recommendation

Response

2. Finding

Recommendation

Response

CONTROL OF SPECIAL PROCESSES
(INPO Procedure MA-407, Revision 1)

An evaluation was performed to determine if personnel are qualified and procedures, equipment and material are controlled for the performance of special processes.

Finding

MAINTENANCE FACILITIES AND EQUIPMENT
(INPO Procedure MA-408, Revision 1)

The evaluation of this area was performed to determine if facilities and equipment provided for the maintenance organization effectively contribute to the performance of required tasks. The location, size and condition of offices, work and storage spaces were examined. In addition, the number, type, condition and location of maintenance tools and equipment were reviewed.

Finding

Recommendation

Response

RADIATION PROTECTION AND CHEMISTRY

Radiation Protection and Chemistry were evaluated by reviewing the performance of radiological protection training, dosimetry, internal and external radiation exposure control, radioactive waste, radioactive contamination control and water chemistry control. This evaluation was primarily an examination of plant programs and facilities as they function under normal (non-outage) conditions. A conclusion was made that the plant's radiological protection and chemistry programs were adequate to protect the public, plant workers and the environment.

**RADIATION PROTECTION AND CHEMISTRY ORGANIZATION
AND ADMINISTRATION**

(INPO Procedure RC-501, Revision 1)

An evaluation was performed to determine the effectiveness of the radiological protection and chemistry organizations and their associated administrative controls. This area was evaluated by reviewing training plans and records for radiological protection and chemistry technicians, interviewing radiological protection technicians, reviewing records of audits and appraisals performed by other organizations along with corrective actions taken and a review of the health physics and chemistry organization.

1. Finding (Ref. Criterion C)

Recommendation

Response

2. Finding (Ref. Criterion D)

Recommendation

Response

3. Finding (General Criterion)

Recommendation

Response

ALARA PROGRAM
(INPO Procedure RC-502, Revision 1)

An evaluation was performed to determine the effectiveness of efforts toward maintaining personnel occupational radiation exposure as low as is reasonably achievable (ALARA). Areas evaluated included the company's ALARA policy, responsibilities for ALARA, level of review for the ALARA program, systems for setting goals and measuring progress and overall scope of ALARA activities.

Finding (Ref. Criteria B, C, D and E)

Recommendation

Response

PERSONNEL DOSIMETRY
(INPO Procedure RC-503, Revision 1)

An evaluation was performed to determine the effectiveness of the plant's dosimetry program in measuring, evaluating and recording occupational radiation exposures. Areas examined included the scope of the dosimetry program, procedural controls, dosimetry selection and use, system operation and exposure records.

Finding (Ref. Criterion D)

Recommendation

Response

RADIATION SURVEILLANCE AND CONTROL
(INPO Procedure RC-504, Revision 1)

An evaluation was performed to determine the effectiveness of the plant's radiological surveillance program and radiological work control mechanisms in identifying and minimizing radiological hazards to workers and management. Areas of interest included surveillance program procedures, surveillance program scope, radiological conditions in the plant, surveillance methodology, level of management review of surveillance data and controls placed upon access to and from work areas.

Finding

WASTE AND DISCHARGE CONTROL
(INPO Procedure RC-505, Revision 2)

This area was evaluated to determine if there is a system of controls that will minimize the generation of radioactive waste, reduce the likelihood of having an inadvertent release and detect the presence of contamination in systems where there should be none. This area was evaluated by reviewing records of solid, liquid and gaseous wastes, tours of areas containing waste processing systems and waste discharge monitors and tours of the radiochemistry laboratory.

Finding (Ref. Criterion E)

Recommendation

Response

RADIOLOGICAL SURVEY EQUIPMENT CONTROL AND CALIBRATION
(INPO Procedure RC-506, Revision 2)

An evaluation was performed to determine the effectiveness of the plant's radiological survey equipment control and calibration program in maintaining a sufficient inventory of instruments and a high degree of accuracy for radiological measurements. The evaluation covered procedures, storage conditions, reference standard traceability, operational response checks, equipment identification and evaluations for out-of-tolerance equipment.

Finding (General Criterion)

Recommendation

Response

PERSONNEL HEALTH PHYSICS INDOCTRINATION
(INPO Procedure RC-507, Revision 2)

An evaluation was performed to determine the effectiveness of the plant's health physics indoctrination program. This area was evaluated by observing the training presented to personnel who enter radiologically controlled areas. Findings were as follows:

1. Finding (Ref. Criterion B)

Recommendation

Response

2. Finding (Ref. Criterion D)**Recommendation****Response**

PROCESS WATER CONTROLS

(INPO Procedure RC-508, Revision 2)

An evaluation was performed to determine the effectiveness of plant process water controls in maintaining the integrity of plant systems. Areas reviewed included procedures; laboratory quality control; bulk chemical, cleaning agent and reagent control; training; and systems chemistry. Process water controls appeared to be effective in minimizing corrosion.

Finding

HEALTH PHYSICS FACILITIES AND EQUIPMENT

(INPO Procedure RC-509, Revision 2)

An evaluation was performed to determine the adequacy of the plant's chemistry and health physics facilities and equipment in satisfying plant needs and in contributing to safe and efficient plant operation. This area was evaluated by tours of the health physics facilities, chemistry laboratories, counting rooms, primary auxiliary building and turbine building.

Finding (Ref. Criterion C)

Recommendation

Response

RESPIRATORY PROTECTION PROGRAM
(INPO Procedure RC-511, Revision 2)

Finding

TECHNICAL SUPPORT

An evaluation was performed to determine the effectiveness of the on-site engineering support group in resolving problems and concerns of a technical nature. Areas reviewed included organizational structure, size, assignment of responsibilities and effectiveness of coordination with other groups. Programs for control of design changes, on-and off-site incident review, plant performance monitoring, reactor engineering and other such engineering activities were also reviewed.

There was evidence that management has reviewed the effectiveness of the engineering support activities and initiated beneficial organization and program changes in several areas. More changes have been planned for the future.

TECHNICAL SUPPORT ORGANIZATION AND ADMINISTRATION

(INPO Procedure TS-701, Revision 1)

The team evaluated the Technical Department to determine if it is capable of performing all assigned responsibilities, personnel are knowledgeable of their duties, a training program exists to enhance and develop the skills and knowledge of personnel and non-technical personnel are utilized for administrative or clerical functions.

1. Finding (Ref. Criteria B and E)

Recommendation

Response

2. Finding (Ref. Criterion D)

Recommendation

Response

ENGINEERING SUPPORT
(INPO Procedure TS-702, Revision 2)

The team examined plant thermal performance monitoring, communication with other groups, document control systems and the engineering support facilities.

1. **Finding** (Ref. Criterion A)

Recommendation

Response

2. Finding (Ref. Criterion D)

Recommendation

Response

NUCLEAR OPERATING EXPERIENCE EVALUATION PROGRAM
(INPO Procedure TS-703, Revision 1)

The team examined the program for handling in-house and nuclear industry operating experiences, utilization of experienced technical personnel, periodic review of program effectiveness and periodic independent evaluation of industry experiences to verify proper classification.

Finding (Ref. Criteria D and E)

Recommendation

Response

PLANT MODIFICATIONS
(INPO Procedures TS-704, Revision 1)

The team examined the method for control and processing of plant modifications to determine if they are implemented in a timely manner and if they maintain the proper quality of plant systems, components, procedures and training.

Finding (Ref. Criterion I)

Recommendation

Response

ON-SITE REACTOR ENGINEERING
(INPO Procedure TS-705, Revision 2)

The team examined procedures, availability of an off-site computer, communications with other groups, fuel integrity commitments and refueling activities.

Finding (Ref. Criterion B)

Recommendation

Response



ADMINISTRATIVE APPENDIX

I. LISTING OF AREAS TO BE EVALUATED

ORGANIZATION AND ADMINISTRATION

- OA-101 Objectives
- OA-102 Organization Structure
- OA-103 Administrative Controls
- OA-104 Quality Programs
- OA-106 Industrial Safety
- OA-107 Surveillance Program
- OA-108 Personnel Qualifications

TRAINING AND QUALIFICATION

- TQ-211 Training Organization and Administration
- TQ-221 Training Resources
- TQ-231 Training Effectiveness
- TQ-242 Non-Licensed Operator Training
- TQ-243 Licensed Operator Training
- TQ-244 Licensed Operator Requalification Training
- TQ-245 Shift Technical Advisor Training

OPERATIONS

- OP-301 Conduct of Shift Operations
- OP-302 Tagout Practices
- OP-303 Operations Organization and Administration
- OP-304 Use of Procedures
- OP-305 Plant Status Controls
- OP-306 Operations Facilities and Equipment
- OP-309 Shift Turnover

MAINTENANCE

- MA-401 Maintenance Organization and Administration
- MA-402 Preventive Maintenance
- MA-403 Maintenance Procedures
- MA-404 Work Control System
- MA-405 Maintenance History
- MA-406 Control and Calibration of Test Equipment and Instrumentation
- MA-407 Control of Special Processes
- MA-408 Maintenance Facilities and Equipment

RADIATION AND CHEMISTRY

- RC-501 Radiation Protection and Chemistry Organization and Administration
- RC-502 ALARA Program
- RC-503 Personnel Dosimetry
- RC-504 Radiation Surveillance and Control
- RC-505 Waste and Discharge Control
- RC-506 Radiological Survey Equipment Control
and Calibration
- RC-507 Personnel Health Physics Indoctrination
- RC-508 Process Water Controls
- RC-509 Health Physics Facilities and Equipment
- RC-511 Respiratory Protection Program

TECHNICAL SUPPORT

- TS-701 Technical Support Organization and Administration
- TS-702 Engineering Support
- TS-703 Nuclear Operating Experience Evaluation Program
- TS-704 Plant Modifications
- TS-705 On-Site Reactor Engineering

II. CONSUMERS POWER COMPANY PERSONNEL CONTACTED

Chairman and President
Executive Vice President, Energy Supply Department
Vice President, Nuclear Operation Department
General Manager
Director, Nuclear Operations Training Department
Operations and Maintenance Superintendent
Technical Superintendent
Chemistry and Health Physics Superintendent
Operation Superintendent
Maintenance Superintendent
Quality Assurance Superintendent
Administrative Supervisor
Property Protection Supervisor
Operations Supervisor
Personnel Director
Senior Technical Analyst
Nuclear Technical Engineer
Technical Engineer
Senior Engineers
Shift Technical Advisors
Shift Supervisors
Outage Control Supervisor
Mechanical Maintenance Engineer
Mechanical Maintenance Supervisor
Assistant Mechanical Maintenance Supervisor
Training Supervisor
Electrical Maintenance Supervisor
Instrument and Control Maintenance Engineer
Instrument and Control Maintenance Supervisor
Assistant Instrument and Control Maintenance Supervisor
Maintenance Planner
Corporate Health Physicist
Health Physicist
Radiation Protection Supervisor
Plant Health Physicist
Dosimetry Laboratory Supervisor
Radioactive Materials Control Supervisor
Document Control Supervisor
Control Operators
Auxiliary Operators
Training Instructors
Instrument and Control Technician
Chemistry Technician
Outage Technician
Radiation Protection Technician
Operations Clerk
Technical Clerk
Dosimetry Clerk
Maintenance Clerk
Planning Clerk

II. CONSUMERS POWER COMPANY PERSONNEL CONTACTED (Cont'd)

Mechanical Repairman "B"
Welder "A"
Electrician "A"

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