Chapter 13: Conduct of Operations

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Chapter 13
CONDUCT OF OPERATIONS

13.1 ORGANIZATIONAL STRUCTURE OF VIRGINIA ELECTRIC AND POWER COMPANY

13.1.1 Organization

13.1.1.1 Nuclear Participation by Vepco

Vepco has participated in nuclear power activities since the passage of the Atomic Energy Act of 1954. In 1954, Vepco participated in a series of studies with Stone & Webster Engineering Corporation. In 1955, Vepco commenced further studies with Carolina Power & Light Company, Duke Power Company, and South Carolina Electric & Gas Company. In 1956, these four companies formed Carolinas Virginia Nuclear Power Associates, Inc. (CVNPA), a nonprofit, membership organization. Subsequently, under the third-round invitation of the Reactor Demonstration Program, CVNPA built and operated the Carolinas-Virginia Tube Reactor (CVTR), a 65-MWt heavy-water moderated and cooled pressure tube reactor located at Parr, South Carolina. The CVTR achieved criticality for the first time in March 1963. From the early summer of 1964 to 1967, the CVTR produced electric power on a reliable basis. CVNPA, and Westinghouse Electric Corporation as its subcontractor, carried out an extensive research and development program for the NRC both before and after construction of the CVTR. The plant was decommissioned in 1967 after fulfilling the objectives of the program.

Vepco was a significant participant in the work of CVNPA from its incorporation. Employees of Vepco served on the CVNPA Board of Directors and on several of the management committees, including the Steering Committee, the Technical Advisory Committee, and the Manpower Committee. Four Vepco employees were associated with CVNPA on a resident basis and had an integrated total of 22 man-years of project experience in responsible positions relating to design, engineering, construction, operating, maintenance, health physics, and chemistry. Individual periods of resident service with CVTR ranged from 2 to 9 years. In addition, two employees of CVNPA joined the Vepco organization in 1967. These two men had a total of over 7 man-years of experience in the CVNPA organization in positions relating to the operation of the CVTR reactor station. Vepco also participated in the study of the practicality of converting the Savannah River “R” reactor with a member on the study team.

Vepco became affiliated along with many other utilities with the Atomics International Division of North American Rockwell Corporation in a joint effort to promote research and development of the first demonstration liquid-metal fast-breeder facility. In addition, Vepco participated in a study with Gulf General Atomics to develop the gas-cooled fast-reactor concept.

13.1.1.2 **Operational Phase**

The execution of the North Anna Power Station project was solely the responsibility of Vepco. In this connection, Vepco (hereafter referred to as Virginia Power) engaged Stone & Webster as its agent for engineering and construction and contracted with Westinghouse Electric Corporation for furnishing the nuclear steam supply systems, the nuclear fuel, and the turbine generators.

In addition to these, Virginia Power retained the following consultants:

Site geology, hydrology, and seismology	Dames & Moore, Inc.
Ecological evaluation	Virginia Commonwealth University and Virginia Polytechnic Institute and State University
Site meteorology, climatology, and general nuclear consultation	NUS Corporation

13.1.1.2.1 Virginia Power Organization and Responsibility

The Site Vice President and his organization have full responsibility for maintaining the station as a functional part of the Virginia Power generation system and for operating the station in a reliable, competent manner consistent with the safety of the public, station personnel, and equipment. The station shall be operated in accordance with the license granted by the United States Nuclear Regulatory Commission (NRC), the Technical Specifications, and the Updated Final Safety Analysis Report (UFSAR), and the Operational Quality Assurance Program.

On November 18, 1983, the NRC approved Amendment Nos. 49 and 33 to the North Anna 1 and 2 Facility Operating Licenses. These amendments reflected the partial sale of North Anna 1 and 2 to the Old Dominion Electric Cooperative (ODEC). The amount of the partial ownership is 11.6% for ODEC. ODEC will be a partial owner, but the responsibility for power operations, maintenance, and maintaining the units in a safe shutdown condition is Virginia Electric and Power Company's.

The nuclear organization and key individuals' responsibilities are described in Chapter 17 (the Operational Quality Assurance Program). Additionally, station personnel will meet the qualification requirements as specified in the Station Technical Specifications and the Operational Quality Assurance Program.

13.2 TRAINING PROGRAM

13.2.1 General

Personnel to staff the North Anna Power Station have been selected to ensure that each individual possesses the educational training and experience necessary to satisfactorily perform his assigned function. To augment the formal education, training and experience of station personnel, training programs have been instituted to familiarize employees specifically with the North Anna plant. The training programs are administered by the corporate Nuclear Training Department, and actual training is performed mainly by site employees, and some by contract personnel from vendor companies.

The principal objectives of the training programs are to ensure initial and continuing qualification of station personnel through effective training, to accommodate future growth, to comply with applicable regulations and to use the training information contained in relevant guidance documents, including:

1. Administrative Procedures
2. Title 10 of the Code of Federal Regulations (CFRs), Parts 50 and 55.
3. ANS 3.1 (Draft 12/79), *Qualification and Training of Personnel for Nuclear Power Plants*.
4. North Anna Power Station Safety Analysis Report documents, including the Updated Final Safety Analysis Report (UFSAR), Facility Operating License (FOL), Technical Specifications, Environmental Protection Plan, and Operational Quality Assurance Program Topical Report.
5. OSHA and other applicable regulatory requirements as specified in Titles 18, 29, 40, and 49 of the Code of Federal Regulations.
6. Institute of Nuclear Power Operations (INPO) guidelines and good practices.
7. NRC inspections and INPO evaluations.

13.2.2 Program Description

13.2.2.1 Types of Training

Station personnel may be qualified through a combination of formal job training, on-the-job training, and special training. The types of training include:

1. Occupational training, which includes all training efforts intended to develop job knowledge, skills, and employee development required for competent performance of assigned duties. This includes nuclear employee training, technical training, and employee development training.
2. Basic training, which is designed to provide an understanding of fundamentals, basic principles, and procedures involved in the work to which the employee is assigned.

3. Advanced training, which addresses topics typically taught to journeymen or supervisors.
4. Special training, which is site or equipment specific.
5. Periodic continuing training (requalification) designed to maintain the levels of occupational knowledge, skills, and employee development required to perform job duties. The continuing training program reinforces previous training and knowledge, and introduces new information as appropriate.
6. Backfit training, which is designed to remedy deficiencies in an employee's background.

13.2.2.2 **Training Methods**

Training is conducted using one or more of the following methods:

1. Formal job training, which is typically classroom training techniques directed at specific job skills and knowledge.
2. On-the-job training, conducted under the direction of appropriately experienced personnel.
3. Self-study training, where job skills and knowledge may be obtained on an individual basis.
4. Classroom training, which is formal training using a variety of instructional techniques and media and requires the trainees to demonstrate their comprehension of the material through discussions, tests, and/or skills performance.
5. Simulator training, which utilizes a plant-referenced simulator for reinforcement of classroom training and exercise of procedures.
6. Laboratory training, which provides actual hands-on experience in simulated job situations. The laboratory experiences are designed to provide structured and supervised methods of practicing the concepts, principles, and information taught in the classroom. Laboratory training is similar to on-the-job training.
7. Task training, which is designed to assist the trainee in becoming proficient in learning the basic to advanced job tasks.
8. In-house training, which is training conducted by an employee of Virginia Power.
9. Vendor training, which is training conducted by someone external to Virginia Power.

13.2.2.3 **Qualification of Personnel**

The cognizant director or manager is accountable for timely and effective qualification of assigned personnel. He is assisted by the Nuclear Training Department and by the Manager Nuclear Training.

The Nuclear Training Department administers standardized programs to meet station requirements, performs training needs assessments, develops methods and materials in support of

programs, evaluates and arranges for vendor training programs for offsite or onsite presentations, and evaluates the overall effectiveness of the programs.

The station, through the Manager Nuclear Training,

1. Identifies training requirements, schedules, and types of training needed.
2. Schedules training consistent with station and regulatory requirements.
3. Conducts specific training segments on the site.
4. Maintains records of employee qualification, training, and experience.
5. Ensures the training and qualification of station personnel.
6. Makes applications for and maintains licenses and proper certifications required for station personnel.

The Nuclear Training Department, through the Manager Nuclear Training, administers operations staff and Shift Technical Advisor training programs which were originally accredited by the National Academy for Nuclear Training on October 24, 1985.

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13.3 EMERGENCY PLANNING

Virginia Power has formulated a comprehensive Corporate Emergency Response Plan (CERP) and a site specific Station Emergency Plan (SEP) for coping with credible emergency situations at the North Anna Power Station. The plan and changes thereto are contained in separately bound documents to facilitate future updating independent of the UFSAR.

The Emergency Plans and Implementing Procedures (EPIP) address the design, operation, and staffing of the Local Emergency Operations Facility (LEOF), the Central Emergency Operations Facility (CEOF), Technical Support Center (TSC), and the Operations Support Center (OSC) using guidance contained in NUREG-0654 (Reference 1), NUREG-0696 (Reference 2), NUREG-0737 (Reference 3), SECY-82-111 (Reference 4), and NEI 99-01 (Reference 5). The Station Emergency Plan is consistent with the NRC Standard Review Plan, Section 13.3, *Emergency Planning,* dated November 1974, and Regulatory Guide 1.101, *Emergency Planning for Nuclear Power Plants,* dated November 1975. The SEP and supporting arrangements for assistance from pertinent Federal, State, and local agencies fully meet the requirements of Appendix E to 10 CFR 50. The SEP also outlines the emergency preparedness training program, including classroom instruction, practical exercises, and demonstrations.

13.3 REFERENCES

1. U. S. Nuclear Regulatory Commission, *NUREG-0654*, *Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants*, November 1980.

2. U. S. Nuclear Regulatory Commission, *NUREG-0696*, *Functional Criteria for Emergency Response Facilities*, February 1981.

3. U. S. Nuclear Regulatory Commission, *NUREG-0737*, *Clarification of TMI Action Plan Requirements*, October 31, 1980.

4. U. S. Nuclear Regulatory Commission, *SECY-82-111*, *Requirements for Emergency Response Capability*, March 11, 1982.

5. NEI 99-01, *Methodology for Development of Emergency Action Levels*, dated January 2003.

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13.4 REVIEW AND AUDIT

Specific review and audit requirements are assigned to various committees in addition to the review and audit requirements assigned to the Virginia Power Quality Assurance staff by the quality assurance program for station operation (see Chapter 17). The committees charged with specific review and audit functions are delineated in Dominion's Nuclear Facility Quality Assurance Program Description (QAPD).

The Facility Safety Review Committee is charged with first-level review of station operations. The membership of the committee, committee responsibilities and authority, and quorum and meeting requirements are delineated in the QAPD. The members of this committee who are station supervisory personnel meet or exceed the qualification requirements of the QAPD.

Independent review of the safety of nuclear unit operation is performed for the Management Safety Review Committee by its Safety and Compliance Subcommittee. The organization and responsibilities of the Management Safety Review Committee are described in the QAPD.

Maintenance and modifications of safety-related equipment are controlled and documented in accordance with the requirements of a formal quality control program for station operation and other administrative controls formulated by written procedures. Audits of quality control programs are periodically conducted as delineated in the operational quality assurance program. The quality assurance and quality control programs pertinent to station operation are discussed in the QAPD.

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13.5 PLANT PROCEDURES

Detailed procedures for the following station operations have been prepared as recommended by Regulatory Guide 1.33 and associated attachments:

- Administrative Procedures
- General Plant Operations
- System Operations
- Abnormal and Alarm Conditions
- Emergency Operations
- Radioactivity Control
- Measuring and Test Equipment Control
- Maintenance and Preventative Maintenance
- Chemical and Radiochemical Control

Other types of procedures not covered by this list may also be required during plant operation. However, procedures are subject to various controls to ensure that personnel are provided with accurate, usable guidance and information. These controls are discussed in the operational quality assurance program (Chapter 17).

The Quality Assurance Program for effluent and environmental monitoring for Technical Specification 5.4.1.c shall use the guidance of References 3 and 4.

A continuing process of review, training, and practice drills, as detailed in the Technical Specifications and operational quality assurance program, maintain the functional effectiveness of the procedures. In addition, procedures are in place for the feedback of industry operating experience to the plant operations staff. Part of the feedback function is accomplished through the use of the INPO SEE-IN Program (Reference 1), which was endorsed by the NRC staff in Generic Letter 82-04 (Reference 2).

13.5 REFERENCES

1. Institute of Nuclear Power Operations, *SEE-IN*, *Significant Event Evaluation and Information Network*, on going information exchange program.
2. U.S. Nuclear Regulatory Commission, *Generic Letter 82-04*, *Use of INPO SEE-IN Program*, March 9, 1982.
3. Regulatory Guide 1.21, Revision 1, June 1974.
4. Regulatory Guide 4.1, Revision 1, April 1975.

13.6 PLANT RECORDS

Records documenting the nuclear operation and maintenance of and modifications to the station shall be stored at a location approved by Virginia Power and in accordance with requirements in the operational quality assurance program (Chapter 17) governing the storage of Quality Assurance Records. Operating records will be maintained as delineated in regulatory requirements and the operational quality assurance program commitments.

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13.7 INDUSTRIAL SECURITY

Physical protection of North Anna Power Station Units 1 and 2 is based on controlling access to the facility, selecting station operating personnel, monitoring station equipment, designing and arranging station features, and obtaining assistance from local law enforcement authorities. Design of the Security Plan is consistent with 10 CFR 73 sections 55, 56, and 57 and Appendices B and C. Implementation of security procedures shall be in accordance with the approved Station Security Plan. Protection of Safeguards Information is provided as described in 10 CFR 73.21.

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