

ATTACHMENT 1

Section 13.1

Topical Report DUKE-2

Conduct of Operations

7908010474

13.0 CONDUCT OF OPERATIONS

13.1 ORGANIZATIONAL STRUCTURE

13.1.1 CORPORATE ORGANIZATION

The corporate structure of Duke Power Company is shown in Figure 13.1.1-1. The President has corporate responsibility for nuclear station design, construction and operation. Reporting to the President are two senior vice presidents, one having line responsibility for Engineering and Construction and the other for Production and Transmission.

13.1.1.1 Corporate Functions, Responsibilities and Authorities

Duke Power Company has over 75 years of experience in the design, construction and operation of electric generating stations. As of January 1, 1979, Duke operated eight conventional steam-electric stations with a capacity of 7,691,000 kWe, one nuclear steam-electric station with a capacity of 2,580,000 kWe, 26 conventional hydroelectric stations with a capacity of 842,000 kWe, four pumped storage hydroelectric units with a capacity of 610,000 kWe and combustion turbine and diesel peaking units with a capacity of 599,000 kWe, for a total system capacity of 12,322,000 kWe.

Company involvement in nuclear power began in the early 1950's with various personnel receiving nuclear training. Selected personnel have been involved full time in nuclear projects since the mid-1950's. Duke participated in the Carolinas-Virginia Nuclear Power Associates (CVNPA), which resulted in a 17,000 kWe nuclear steam-electric unit at Parr, South Carolina. This unit, the Carolinas-Virginia Tube Reactor (CVTR), produced electricity over the period 1963 to 1967 as part of a five-year operating research program. Duke's three unit Oconee Nuclear Station began operation in 1973. Ten additional nuclear units are in various stages of design, licensing, construction and startup. As a result of these and other assignments, many engineering personnel in the Duke organization have had prior nuclear experience as well as extensive experience in the power field.

Various departments within the Company have responsibility for design, construction, quality assurance and operation of each nuclear station. Duke contracts with a nuclear steam supply system (NSSS) vendor for the design and manufacture of the complete NSSS. The NSSS vendor also provides technical consultation in areas such as construction, testing, startup and initial fuel loading.

Duke's corporate functions, responsibilities and authorities for quality assurance are addressed in Topical Report, DUKE-1A.

13.1.1.2 Organization for Design and Construction

The Design Engineering Department has the specific responsibility for design of structures and systems, specification of materials and equipment and preparation of construction and installation drawings for new generating facilities. The Vice President, Design Engineering has overall responsibility for the

design of nuclear generating stations, and, at all times, one of the Chief Engineers has project management responsibility. This responsibility is transferred from the Civil-Environmental Division, to the Mechanical-Nuclear Division and then to the Electrical Division as the job progresses. The organizational structure of the Design Engineering Department is shown in Figure 13.1.1-2.

The Construction Department has the responsibility for all site construction activities. The department is organized by projects and each nuclear station has a separate project group. The Construction Department is responsible for certain field testing (e.g., preoperational hydrostatic testing).

13.1.1.3 Station Support Organization

The Steam Production Department is responsible for operation and maintenance of fossil and nuclear stations. This department provides general supervision and technical management services for the stations. The Steam Production organization is shown in Figure 13.1.1-3. The educational background and experience of key personnel is given in Table 13.1.1-1.

Personnel within the Steam Production Department have considerable nuclear experience from work associated with the Oconee Nuclear Station. As of January 1, 1978, there were approximately 300 technical/professional personnel supporting station operation. It is anticipated that this staff will expand to approximately 490 persons by 1985 in order to support startup and operation of the generating capacity now under construction.

The Nuclear Production Division has line responsibility for operating and maintaining nuclear generation facilities in a safe, economical, and reliable manner to meet Company and regulatory requirements.

The System Operation and Maintenance Group is responsible for providing support to the nuclear stations for major maintenance, materials management and other operation and maintenance functions requiring specialized services including security systems, fire protection, fuel handling equipment, and support of pre-operational and startup activities.

The System Results and Fuel Management Group is responsible for fuel management activities for new and operating generating units. Included in these activities are special nuclear materials accountability and core performance analysis.

The Technical and Environmental Services Group is responsible for providing environmental, chemical, health physics, licensing, computer and instrumentation and control support services for new and operating generating facilities. This group is also responsible for coordinating departmental reviews of nuclear station design and layout.

The Training Services Group is responsible for technical training, employee development and industrial safety programs within the department. These responsibilities include licensed operator training and requalification programs.

Other departments within the Company are available for consultation and assistance as required. The Design Engineering Department is available to furnish nuclear, mechanical, structural, electrical, thermo-hydraulic and metallurgy and materials engineering. Other departments which regularly supply assistance and services for the station are the Transmission Department and the Construction Department.

13.1.2 OPERATING ORGANIZATION

13.1.2.1 Station Organization

The organization of each nuclear station staff generally follows the pattern already proven to be successful in Duke's conventional steam stations and in the Oconee Nuclear Station. The underlying philosophy is that the station staff is to be fully capable and equipped to handle all situations involving safety of the station and public.

The nuclear station staff for one, two, and three units is shown in Figures 13.1.2-1, -2 and -3. Positions shown are functional and may not correspond to actual titles. Each nuclear station is staffed at sufficient levels prior to operation to allow for training, procedure development, and other pre-operational activities.

13.1.2.2 Personnel Functions, Responsibilities and Authorities

The functions and responsibilities of the station supervisory staff are described in the succeeding paragraphs.

(a) Station Manager

The station Manager reports to the Manager, Nuclear Production and has direct responsibility for operating the station in a safe, reliable and efficient manner. He is responsible for protection of the station staff and the general public from radiation exposure and/or any other consequences of an accident at the station. He bears the responsibility for compliance with the facility operating license. The station Manager or his designee has the authority to approve and issue Station Directives and procedures.

(b) Superintendent of Administration

The Superintendent of Administration is responsible for coordination of station administrative functions including clerical, document control, safety, fire protection, training and security. In the event of the absence of the station Manager, the Superintendent of Administration, if so designated, assumes the responsibilities and authority of the station Manager.

(c) Superintendent of Operations

The Superintendent of Operations has the responsibility for directing the actual day-to-day operation of the station. In the event of the absence of the station Manager, the Superintendent of Operations, if so designated, assumes the responsibilities and authority of the station Manager.

(d) Operating Engineer

An Operating Engineer assists the Superintendent of Operations in directing station operation and may assume complete responsibility for station operation in the absence of the Superintendent of Operations.

(e) Shift Supervisor

A Shift Supervisor is responsible for the actual operation of the station on his assigned shift. He directs the activities of the operators on his shift and is cognizant of all maintenance activity being performed while he is on duty. The Shift Supervisor on duty has both the authority and the obligation to shut down a unit if, in his opinion, conditions warrant this action.

(f) Assistant Shift Supervisor

As Assistant Shift Supervisor assists the Shift Supervisor in operation of the station on his assigned shift. The Assistant Shift Supervisor on duty has both the authority and the obligation to shut down a unit if, in his opinion, conditions warrant this action.

(g) Reactor Operator

A Reactor Operator is responsible for the actual operation of a unit on his assigned shift. The Reactor Operator has both the authority and obligation to shut down a unit if, in his opinion, conditions warrant this action.

(h) Utility Operator

A Utility Operator is responsible for the operation of equipment outside of the Control Room.

(i) Superintendent of Technical Services

The Superintendent of Technical Services is responsible for directing the activities of the Technical Services Group, which includes performance, chemistry and health physics. In the event of absence of the station Manager, the Superintendent of Technical Services, if so designated, assumes the responsibilities and authority of the station Manager.

(j) Performance Engineer

The Performance Engineer directs data gathering and evaluation in the areas of equipment and station performance. Specifically included in this are core physics and core performance, from both nuclear and thermal-hydraulic considerations. He assists in setting up fuel shuffling patterns and participates in other phases of fuel management.

(k) Station Health Physicist

The Station Health Physicist has the responsibility for conducting the health physics program. His duties include the training of personnel in use of equip-

ment, control of radiation exposure of personnel, continuous determination of the radiological status of the station, surveillance of radioactive waste disposal operations, conducting the radiological environmental monitoring program and maintaining all required records. He has direct access to the station Manager in matters concerning any phase of radiological protection. The Station Health Physicist also has direct support as required from the System Health Physicist and his staff.

(l) Station Chemist

The Station Chemist is responsible for overall chemistry and radiochemistry requirements, with special emphasis on primary and secondary system water chemistry.

(m) Licensing and Projects Engineer

The Licensing and Projects Engineer has responsibility for coordinating station modification activities and interfaces with regulatory agencies and for providing reviews of appropriate station technical matters.

(n) Superintendent of Maintenance

The Superintendent of Maintenance is responsible for directing the activities of the Maintenance Group, which includes mechanical and electrical maintenance and instrumentation and control. In the event of absence of the station Manager, the Superintendent of Maintenance, if so designated, assumes the responsibilities and authority of the station Manager.

(o) Maintenance Engineer (Mechanical)

The Maintenance Engineer (Mechanical) has responsibility for maintenance of mechanical equipment.

(p) Maintenance Engineer (I&E)

The Maintenance Engineer (I&E) has responsibility for maintenance of electrical equipment, instrumentation, controls, and computers. He also supervises computer maintenance.

(q) Maintenance Engineer (Planning)

The Maintenance Engineer (Planning) has responsibility for planning and scheduling of all maintenance work as well as directing all material management activities.

(r) Senior Station Quality Assurance Engineer

The functions, responsibilities and authorities of the Senior Station Quality Assurance Engineer are described in Topical Report, DUKE-1A.

13.1.2.3 Shift Crew Composition

A Shift Supervisor is responsible for operation of the station on his shift. Reporting to the Shift Supervisor are operating personnel and at least one individual qualified in radiation protection procedures. For each unit, an operating shift consists of one Assistant Shift Supervisor, who holds a Senior Reactor Operators license, two Reactor Operators both of whom hold a Reactor Operators license, and two Utility Operators who do not necessarily hold an NRC license.

For each unit containing fuel, there is at least one licensed operator in the control room at all times. During refueling operations, an additional Senior Reactor Operator who has no other concurrent responsibilities directly supervises fuel handling operations. Detailed shift crew requirements are defined in the Technical Specifications for each nuclear unit.

13.1.3 QUALIFICATIONS OF STATION PERSONNEL

The qualifications of personnel in the operating staff are in accordance with Section 4 of ANSI N18.1-1971, "Selection and Training of Nuclear Power Plant Personnel", and are in accordance with Regulatory Guide 1.8 (Rev. 1) with the exception of those for the Operations Manager in Section 4.2.2 of ANSI N18.1-1971 and for the Radiation Protection Manager in Part C of Reg. Guide 1.8.

The Operations Manager (Superintendent of Operations) shall be an experienced professional in the operation of commercial nuclear facilities and shall have a minimum of eight years of responsible nuclear or fossil station experience, of which a minimum of three years shall be nuclear station experience. A maximum of two years of the remaining five years of power plant experience may be fulfilled by satisfactory completion of academic training. The Superintendent of Operations shall hold or have held a Senior Reactor Operators license at this facility or other commercial nuclear facility. This minimum qualification for the Superintendent of Operations is deemed satisfactory due to the size of the operating staff and the current level of experience of operations personnel.

The RPM (Station Health Physicist) shall have a bachelor's degree in a science or engineering subject or the equivalent in experience, including some formal training in radiation protection, and shall have at least five years of professional experience in applied radiation protection of which three years shall be in applied radiation protection work in one of Duke Power Company's nuclear stations. A qualified individual who does not meet the above requirements, but who has demonstrated the required radiation protection management capabilities and has professional experience in applied radiation protection work at one of Duke Power Company's multi-unit nuclear stations, may be appointed to the position of Station Health Physicist by the station Manager, based on the recommendations of the System Health Physicist and as approved by the Manager, Nuclear Production.

Replacement personnel for positions in the nuclear stations are fully trained and qualified to fill their appointed positions.

13.1.3.1 Minimum Qualification Requirements

The minimum qualification requirements for station personnel are outlined in the succeeding paragraphs.

(a) Station Manager

The station Manager shall have a minimum of ten years of responsible nuclear or fossil station experience, of which a minimum of three years shall be nuclear station experience. A maximum of four years of the remaining seven years of experience may be fulfilled by academic training on a one-for-one, time basis. To be acceptable, this academic training shall be in an engineering or scientific field generally associated with power production. The station Manager shall have acquired the experience and training normally required for examination by the NRC for a Senior Reactor Operator license, whether or not the examination is taken.

(b) Superintendent of Operations

The Superintendent of Operations shall have a minimum of eight years of responsible nuclear or fossil station experience, of which a minimum of three years shall be nuclear station experience. A maximum of two years of the remaining five years of experience may be fulfilled by academic training, or related technical training, on a one-for-one, time basis. The Superintendent of Operations shall hold or have held a Senior Reactor Operator license.

(c) Superintendent of Technical Services

The Superintendent of Technical Services should have a minimum of eight years of responsible nuclear or fossil station experience, of which a minimum of one year shall be nuclear station experience. A maximum of four years of the remaining seven years of experience should be fulfilled by satisfactory completion of academic training.

(d) Superintendent of Maintenance

The Superintendent of Maintenance shall have a minimum of seven years of responsible nuclear or fossil station experience, or applicable industrial experience, of which a minimum of one year shall be nuclear station experience. A maximum of two years of the remaining six years of experience may be fulfilled by satisfactory completion of academic or related technical training on a one-for-one time basis. The Superintendent of Maintenance should also have non-destructive testing familiarity, craft knowledge, and an understanding of electrical, pressure vessel and piping codes.

(e) Operating Engineer

An Operating Engineer shall have a minimum of a high school diploma, or equivalent, and four years of responsible nuclear or fossil station experi-

ence, of which a minimum of one year shall be nuclear station experience. A maximum of two years of the remaining three years of experience may be fulfilled by academic or related technical training on a one-for-one, time basis. An Operating Engineer shall hold a Senior Reactor Operator license.

(f) Performance Engineer

The Performance Engineer shall have a minimum of a Bachelor's degree in engineering or the physical sciences and two years of responsible nuclear power plant experience. The Performance Engineer or the Reactor Engineer shall have two years of experience in such areas as reactor physics, core measurements, core heat transfer, and core physics testing programs.

(g) Station Chemist

The Station Chemist shall have a minimum of five years of experience in chemistry, of which a minimum of one year shall be in radiochemistry. A minimum of two years of this five years of experience should be fulfilled by academic or related technical training. A maximum of four years of this five years of experience may be fulfilled by academic or related technical training.

(h) Station Health Physicist

The Station Health Physicist shall have a minimum of seven years of experience in radiation protection at a nuclear facility. A minimum of two years of this seven years of experience should be related technical training. A maximum of four years of this seven years of experience may be fulfilled by academic or related technical training.

(i) Licensing and Projects Engineer

The Licensing and Projects Engineer shall have a minimum of five years of technical experience, of which a minimum of one year shall be nuclear station experience. A minimum of four years of this five years experience may be fulfilled by related technical or academic training.

(j) Maintenance Engineer (Mechanical)

The Maintenance Engineer (Mechanical) shall have a high school diploma, or equivalent, and a minimum of four years of experience in maintenance activities.

(k) Maintenance Engineer (I&E)

The Maintenance Engineer (I&E) shall have a minimum of five years of experience in instrumentation and control of which a minimum of six months shall be in nuclear instrumentation and control. A minimum of two years of this five years of experience should be fulfilled by academic or related technical training. A maximum of four years of this five years of experience may be fulfilled by academic or related technical training.

(l) Maintenance Engineer (Planning)

The Maintenance Engineer (Planning) shall have the same qualifications as the Maintenance Engineer (Mechanical).

(m) Shift Supervisor

A Shift Supervisor shall have the same qualifications as the Operating Engineer.

(n) Assistant Shift Supervisor

An Assistant Shift Supervisor shall have the same qualifications as a Shift Supervisor.

(o) Operators

Operators to be licensed by the NRC shall have a high school diploma, or equivalent, and two years of nuclear or fossil station experience, of which a minimum of one year shall be nuclear station experience. In order to be acceptable for full responsibility in a job, they shall hold a Reactor Operator license.

Operators, whether or not they are to be licensed by the NRC, should have a high school diploma, or equivalent, and should possess a high degree of manual dexterity and mature judgment.

(p) Technicians

Technicians in responsible positions (i.e., individuals who direct the activities of others and who are responsible for the activities they direct) shall have a minimum of two years of experience in their specialty. These personnel should have a minimum of one year of related technical training in addition to their experience.

(q) Maintenance Personnel

Maintenance personnel in responsible positions (i.e., individuals who direct the activities of others and who are responsible for the activities they direct) shall have a minimum of three years of experience in one or more crafts. They should possess a high degree of manual dexterity and ability, and should be capable of learning and applying basic skills in maintenance operations.

13.1.3.2 Qualifications of Station Personnel

Qualifications of station personnel are provided in the respective FSAR's.

QUALIFICATIONS OF KEY PERSONNEL

NAME: W. O. Parker, Jr.

POSITION: Vice President, Steam Production

EDUCATION:

1946 B. S. Mechanical Engineering
Illinois Institute of Technology

CERTIFICATION/LICENSES:

Registered Professional Engineer in North Carolina

EXPERIENCE:

Duke Power Company

Various assignments at Cliffside Steam Station (1947-55)
Operating Assistant (1955-59)
Steam Production Engineer (1959-66)
Chief Production Engineer (1966-67)
Assistant Manager, Steam Production (1967-72)
Manager, Steam Production (1972-73)
Assistant Vice President, Steam Production (1973-74)
Vice President, Steam Production (1974-Present)

TABLE 13.1.1-1 (Page 2)
QUALIFICATIONS OF KEY PERSONNEL

NAME: H. B. Tucker

POSITION: Manager, Nuclear Production Division

EDUCATION:

1949 B. S. Electrical Engineering
Georgia Institute of Technology

EXPERIENCE:

Duke Power Company

Various steam station assignments (1949-62)
Superintendent, Riverbend Steam Station (1962-67)
System Production Engineer (1967-71)
Manager, Operation and Maintenance (1971-74)
Manager, Nuclear Production Division (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: P. H. Barton

POSITION: Manager, System Operation and Maintenance

EDUCATION:

1948 B. S. Mechanical Engineering
Clemson University

1961 Reactor Operation Supervisory Program
Oak Ridge School of Reactor Technology

CERTIFICATION/LICENSES:

Registered Professional Engineer in North and South Carolina
Senior Operator License for Carolina-Virginia Tube Reactor

EXPERIENCE:

Duke Power

Various steam station and general office staff assignments (1948-60)
CVNPA (1960-64)
Project Engineer (1964-1968)
Manager, Technical and Nuclear Services (1968-74)
Manager, System Operation and Maintenance (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: F. C. Hayworth

POSITION: Manager, System Operation Section

EDUCATION:

1964 B. S. Mechanical Engineering
N. C. State University

EXPERIENCE:

Duke Power Company

Various steam station assignments (1964-1969)
Assistant Production Engineer (1969-71)
Production Engineer (1971-74)
Manager, System Operation Support Section (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: H. D. Lyerly

POSITION: Manager, System Maintenance

EDUCATION:

1960 B. S. Mechanical Engineering
N. C. State University

EXPERIENCE:

Duke Power Company

Various steam station assignments (1960-63)
Test Engineer (1963-71)
System Instrumentation and Control Engineer (1971-74)
Manager, System Maintenance Support Section (1974-78)
Manager, System Maintenance (1978-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: B. E. Telford

POSITION: Manager, Materials Management

EDUCATION:

1962 B. S. Business Administration
West Virginia University

1964 Masters Business Administration
West Virginia University

EXPERIENCE:

The Boeing Company, Aero-Space Division
Industrial Engineer, Schedule Planner (1962-63)

Ford Motor Company, Transmission and Chassis Division
Plant Production Control (1964-66)
Parts Salvage & Disposal Analyst (1967)
Supervisor, Parts Follow-up and Shop Scheduling (1967-68)

Management Information, Inc.
Project Manager, Manufacturing (1968-70)

The Valeron Corporation
Inventory Control Manager (1970-74)

Duke Power Company
Materials Management Coordinator (1975-76)
Manager, Materials Management (1976-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: C. D. Hatley, Jr.

POSITION: Manager, System Operation and Maintenance Engineering

EDUCATION:

1962 B. S. Mechanical Engineering
N. C. State University

EXPERIENCE:

Duke Power Company

Various general office and steam station assignments (1962-70)
Assistant Superintendent, Cliffside Steam Station (1970-75)
Manager, System Operation and Maintenance Engineering (1975-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: R. W. Bostian

POSITION: Manager, System Results and Fuel Management

EDUCATION:

1949 B. S. Mechanical Engineering
N. C. State University

EXPERIENCE:

Duke Power Company

Various steam station assignments (1950-62)
Superintendent, Allen Steam Station (1962-71)
System Production Engineer (1971-73)
Manager, Fuel Utilization (1973-74)
Manager, System Results and Fuel Management (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: J. S. Davis, Jr.

POSITION: Manager, System Results

EDUCATION:

1950 B. S. Mechanical Engineering
Virginia Polytechnic Institute and State University

CERTIFICATION/LICENSES:

Registered Professional Engineer in North Carolina

EXPERIENCE:

Duke Power Company

Various steam station assignments (1950-51)
Test Engineer (1951-68)
System Performance and Instrumentation Engineer (1968-71)
Manager, Computers and Projects (1971-74)
Manager, System Results (1974-Present)

TABLE 13.1.1-1 (Page 10)
QUALIFICATIONS OF KEY PERSONNEL

NAME: H. T. Snead

POSITION: Manager, Nuclear Fuel Services

EDUCATION:

1967 B. S. Nuclear Engineering
N. C. State University

EXPERIENCE:

Duke Power Company

Various assignments in Design Engineering and Steam Production
Departments (1967-73)
Nuclear Fuels Engineer (1973-75)
System Nuclear Fuels Engineer (1975-76)
Manager, Nuclear Fuel Services (1976-Present)

TABLE 13.1.1-1 (Page 11)

QUALIFICATIONS OF KEY PERSONNEL

NAME: W. A. aller

POSITION: Manager, Technical and Environmental Services

EDUCATION:

- 1960 B. S. Chemistry
Lasalle College
- 1963 M. S. Nuclear Chemistry
University of Notre Dame
- 1971 Ph.D. Nuclear Chemistry
Washington State University

EXPERIENCE:

- General Electric Company
Staff Chemist (1963-65)
- Battelle Northwest
Staff Chemist (1965-71)
- Babcock & Wilcox Company
Manager - Chemistry and Health Physics (1971-73)
- Duke Power Company
Manager, Chemical and Environmental Services (1974)
Manager, Technical and Environmental Services (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: K. S. Canady

POSITION: Manager, Project Coordination and Licensing

EDUCATION:

1963 B. S. Nuclear Engineering
North Carolina State University

EXPERIENCE:

Lockheed - Georgia Corporation
Associate Engineer (1963-65)

Research Triangle Institute
Project Manager (1965-68)

Duke Power Company
Assistant Test Engineer (1968-71)
Nuclear Engineer (1971-72)
System Nuclear Engineer (1972-74)
Manager, Project Coordination and Licensing (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: W. A. Coley

POSITION: Manager, Engineering Services

EDUCATION:

1966 B. S. Electrical Engineering
Georgia Institute of Technology

CERTIFICATION/LICENSES:

Registered Professional Engineer in North and South Carolina

EXPERIENCE:

Duke Power Company

Co-op student (1961-66)
Various steam station assignments (1966-71)
Test Engineer (1971)
Instrumentation and Control Engineer (1971-74)
Manager, Engineering Services (1974-Present)

TABLE 13.1.1-1 (Page 14)
QUALIFICATIONS OF KEY PERSONNEL

NAME: R. F. Gray

POSITION: Manager, Scientific Services

EDUCATION:

1964 B. S. Civil Engineering
N. C. State University

EXPERIENCE:

Duke Power Company

Various assignments in the Design Engineering, Real Estate and
Steam Production Departments (1964-71)
System Environmental Engineer (1971-74)
Manager, Scientific Services (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: Lionel Lewis

POSITION: System Health Physicist

EDUCATION:

1949 B. A. Pre-medical Sciences
University of Vermont

1955 M. S. Radiological Biophysics
University of Rochester

CERTIFICATION/LICENSES:

Certified in Health Physics by the American Board of Health Physics (1961)

EXPERIENCE:

Brookhaven National Laboratory
Jr. Health Physicist (1953-55)

The Martin Co.
Assistant Supervisor of Health Physics (1955-57)

Combustion Engineering, Inc.
Supervisor of Health Physics, Safety and Industrial Hygiene (1957-60)

Carolinas-Virginia Nuclear Power Associates (CVTR)
Health Physicist and Safety Coordinator (1961-67)
Plant Superintendent (1963-64)

Duke Power Company
Staff Health Physicist (1967-71)
System Health Physicist (1971-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: R. B. Thompson

POSITION: System Power Chemist

EDUCATION:

1948 B. S. Chemistry
Presbyterian College

EXPERIENCE:

Duke Power Company

Various steam station assignments (1948-69)
Staff Chemist (1969-71)
System Power Chemist (1971-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: E. L. Thomas

POSITION: Manager, Training Services

EDUCATION:

1947 B. S. Mechanical Engineering
Clemson University

EXPERIENCE:

Duke Power Company

Various steam station assignments (1947-61)
Assistant Superintendent Riverbend Station (1961-1963)
Superintendent, Marshall Steam Station (1963-71)
Manager, Employee Development (1971-75)
Manager, Training Services (1975-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: R. J. Marzec

POSITION: Manager, Technical Training

EDUCATION:

1972 B. S. Nuclear Engineering
Texas A & M University

1974 M. E. Nuclear Engineering
Texas A & M University

CERTIFICATION/LICENSES:

Has held RO or SRO Licences for 4 separate reactors

EXPERIENCE:

U. S. Navy
Electronics Instructor (1951-54)

U. S. Air Force
Training Devices Superintendent (1954-1963)

U. S. Air Force - Army Nuclear Program, Sundance, Wyoming
Trainee & Operator (1963-65)
Maintenance Superintendent (1965-67)
Plant Manager, PMI Nuclear Plant (1967-68)

U. S. Air Force - Wright Patterson Field
Operations & Maintenance Superintendent (1968-1970)

Texas A & M University
Reactor Supervisor AGN 201 (1970-74)
Instructor, Electronic Engineering Technology Department (1972-74)

Duke Power Company
Manager, Technical Training (1974-Present)

QUALIFICATIONS OF KEY PERSONNEL

NAME: B. F. Caldwell

POSITION: Manager, Safety and General Training Section

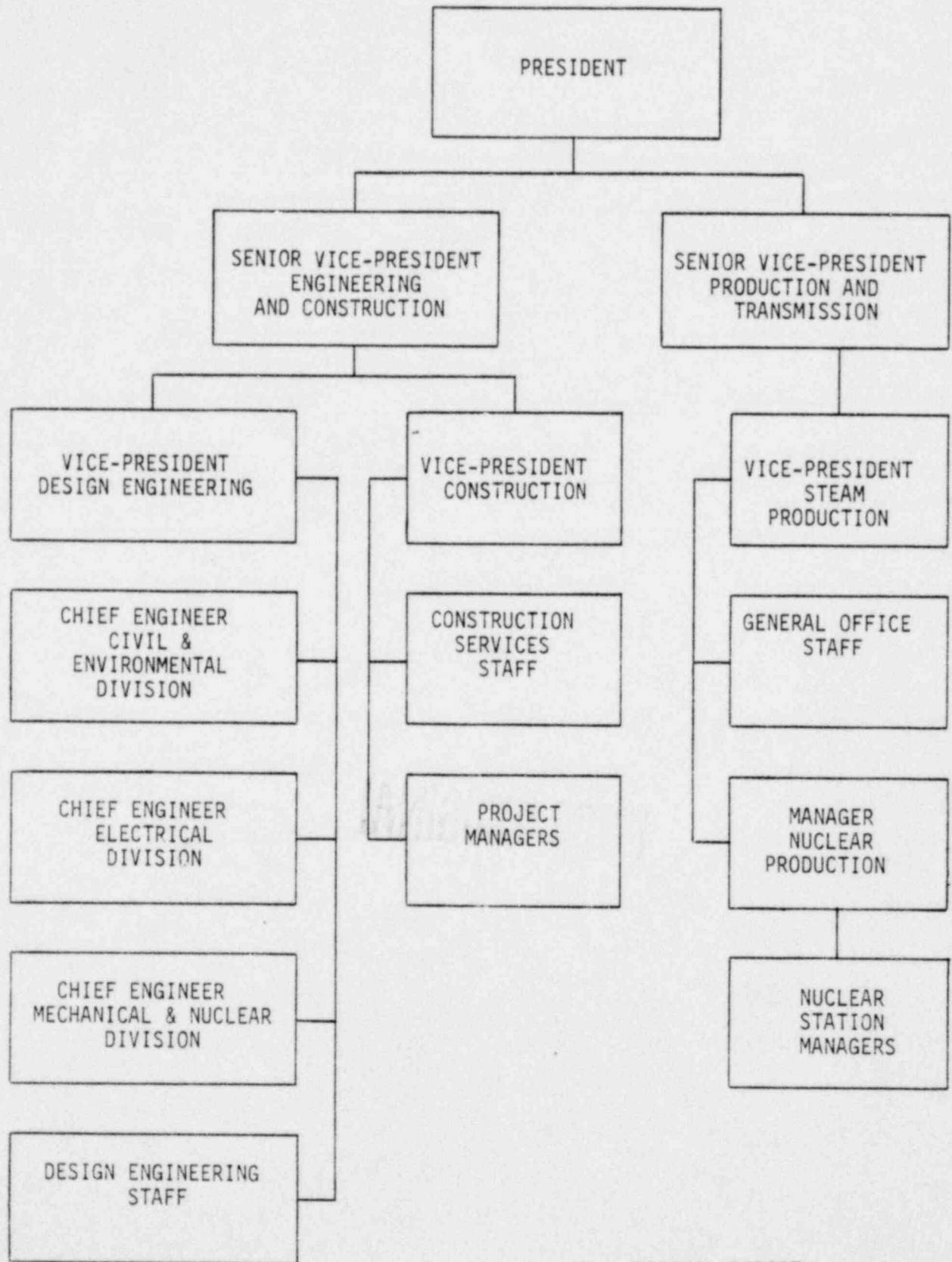
EDUCATION:

1970 B. S. Mechanical Engineering
University of North Carolina Charlotte

EXPERIENCE:

Duke Power Company

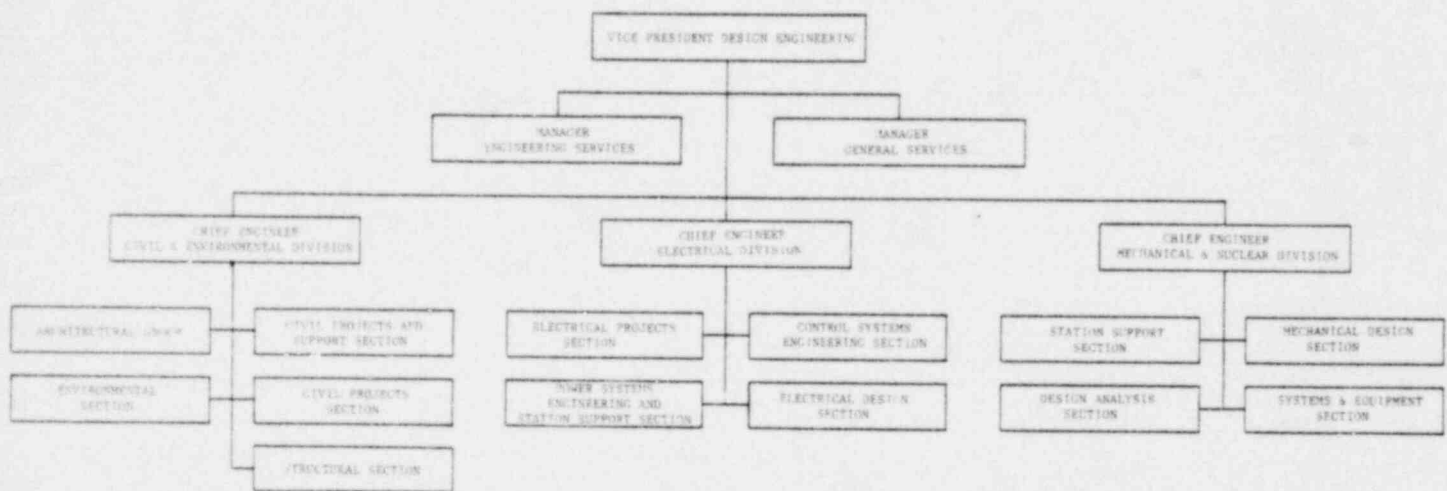
Various steam station assignments (1970-73)
Assistant Training Engineer (1973-74)
Training Requirements Engineer (1974-78)
Manager, Safety and General Training (1978-Present)



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FIGURE 13.1.1-1
CORPORATE ORGANIZATION

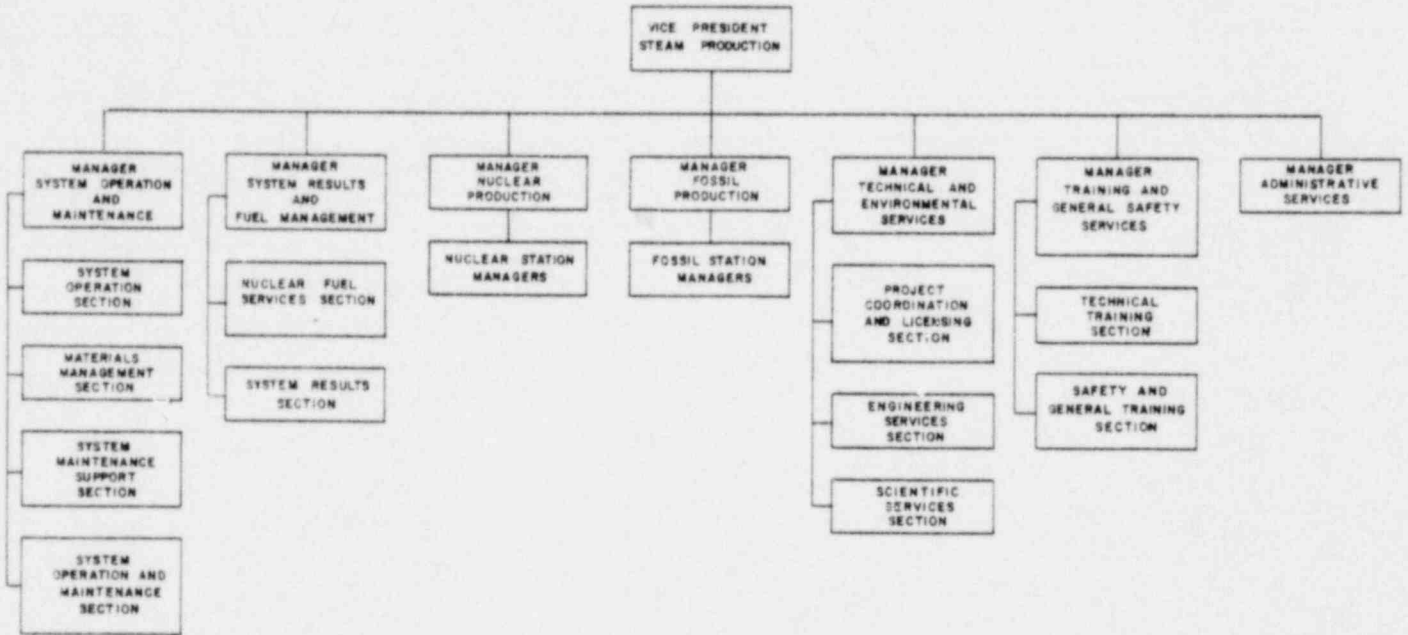


POOR ORIGINAL



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CONDUCT OF OPERATIONS

FIGURE 13.1.1-2
DESIGN ENGINEERING DEPARTMENT

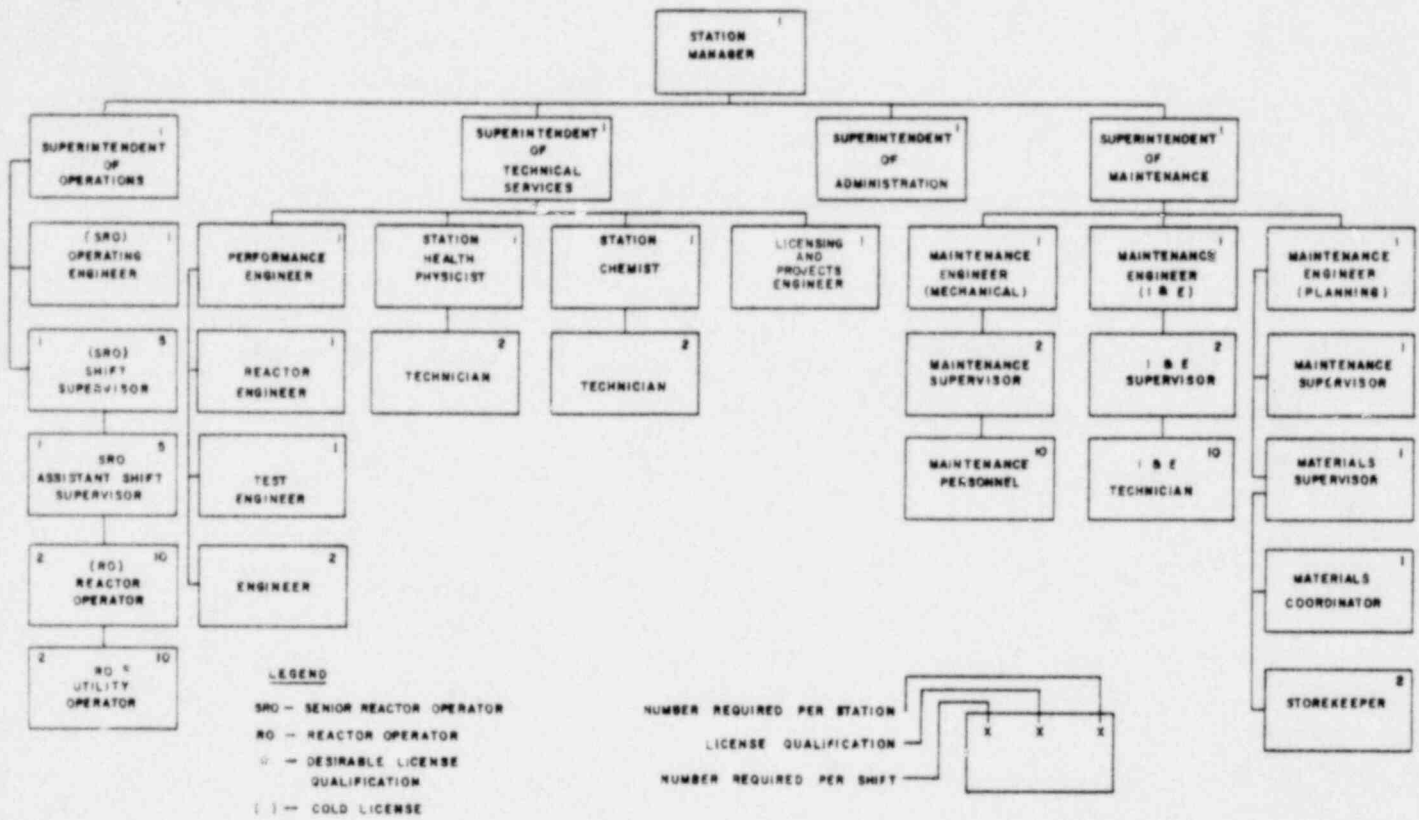


POOR ORIGINAL



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FIGURE 13.1.1-3
STEAM PRODUCTION DEPARTMENT

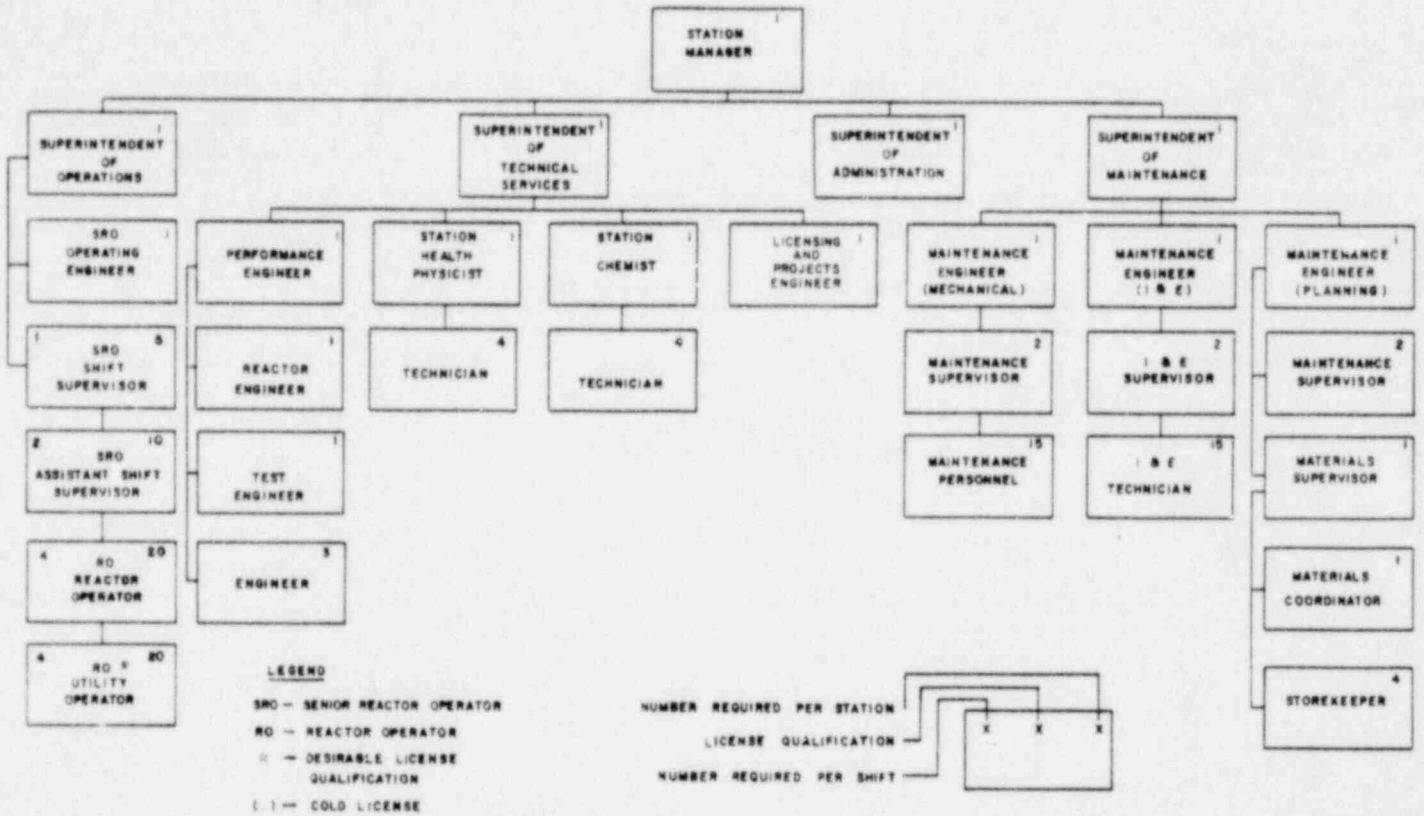


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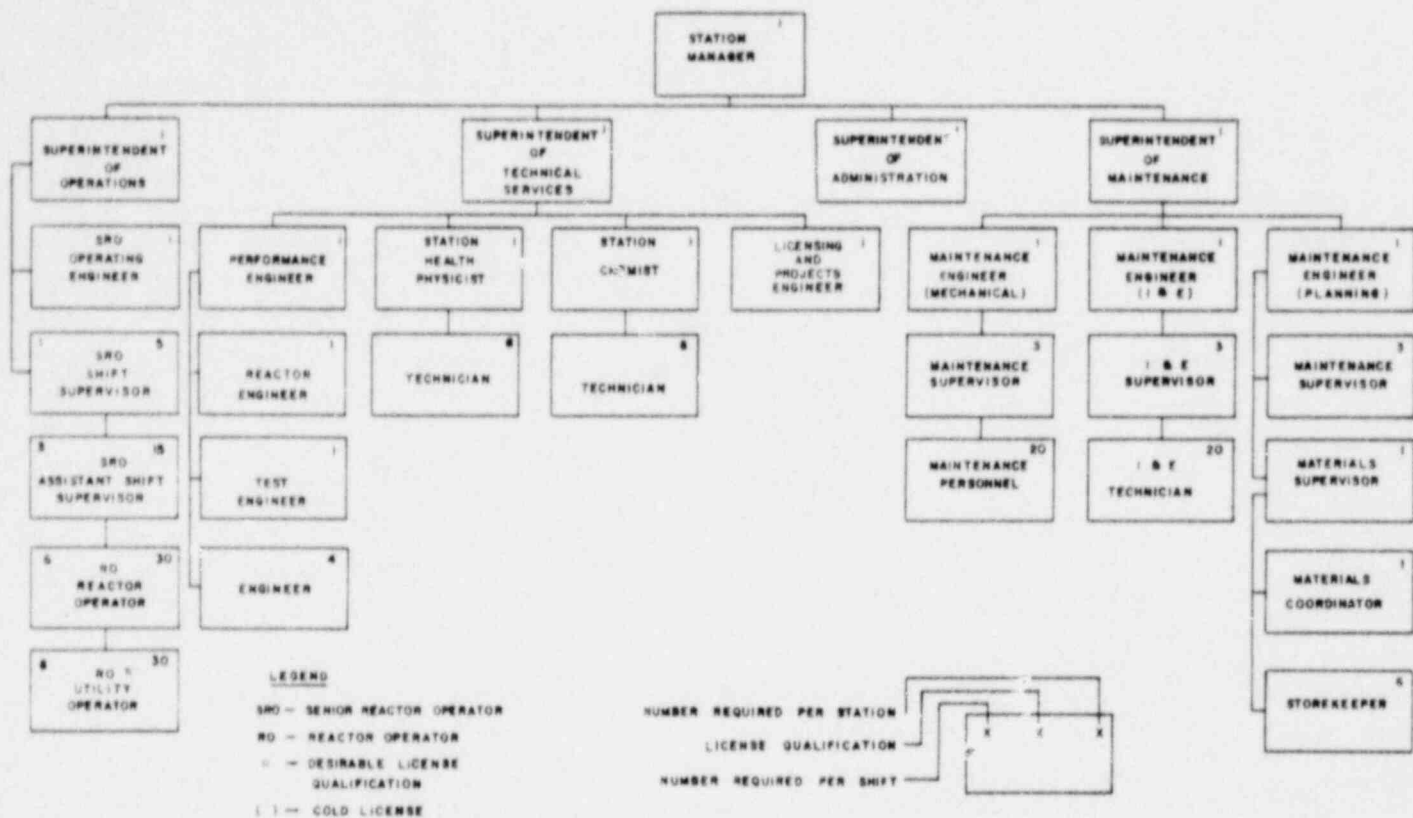
FIGURE 13.1.2-1
STATION ORGANIZATION
ONE UNIT OPERATION



POOR ORIGINAL



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 CONDUCT OF OPERATIONS
 FIGURE 13.1.2-2
 STATION ORGANIZATION
 TWO UNIT OPERATION



POOR ORIGINAL



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CONDUCT OF OPERATIONS

FIGURE 13.1.2-3
STATION ORGANIZATION
THREE UNIT OPERATION

ATTACHMENT 2

Qualifications of Key Management Personnel

Name: W. S. Lee

Position: President and Chief Operating Officer

Education: 1951 B.S. Civil Engineering
Princeton University

Certification/Licenses:

Registered Professional Engineer in North and South Carolina

Experience:

Duke Power Company

Various assignments in the Design Engineering Department (1955-65)

Vice President, Design Engineering (1965-71)

Senior Vice President, Engineering and Construction (1971-78)

Executive Vice President (1976-78)

President and Chief Operating Officer (1978-Present)

Organizations and Committees:

Greater Charlotte Chamber of Commerce, Chairman of the Board

Queens College, Trustee

United Community Services, Director

University of NC at Charlotte Foundation, Trustee

South Carolina Energy Research Institute, Director

American Society of Civil Engineers

American Society of Mechanical Engineers

American Nuclear Society

National Society of Professional Engineers

Charlotte Engineers' Club

Princeton Engineering Association

Advisory Committee, Engineering College, UNC-C

Professional Engineers of NC

NC Society of Engineers

North Carolina Energy Policy Council (appointed by Governor)

US Committee on Large Dams

Edison Electric Institute, Policy Committee on Nuclear Power

Name: W. H. Owen

Position: Senior Vice President, Engineering and Construction

Education: 1947 B. Mechanical Engineering
Clemson University

Certification/Licenses:

Registered Professional Engineer in North and South Carolina.

Experience:

Duke Power Company

Various assignments in the Steam Production Department (1948-62)
Senior Engineer, Design Engineering Department (1962-66)
Principal Mechanical Engineer (1966-71)
Vice President, Design Engineering (1971-78)
Senior Vice President, Engineering and Construction (1978-Present)

Organizations and Committees:

American Society of Mechanical Engineers
American Nuclear Society
North Carolina Society of Engineers
Charlotte Engineers Club
Professional Engineers of North Carolina
The Charlotte Rotary Club
Atomic Industrial Forum
Member of Steering Group, Committee on Reactor Licensing and Safety
Electric Power Research Institute
Member of Research Advisory Committee
Edison Electric Institute
Member of Executive Advisory Committee on Nuclear Power
University of North Carolina at Charlotte
Member of Engineering Advisory Council
University of Virginia
Member of Industrial Advisory Committee
North Carolina Energy Institute
Member of Board of Scientific Advisors

Name: A. C. Thies

Position: Senior Vice President, Production and Transmission

Education: 1943 B.S. Mechanical Engineering
Georgia Institute of Technology

Experience:

Duke Power Company

Various assignments in the Steam Production Department (1946-63)
Manager of Steam Production (1963-65)
Assistant Vice President, Steam Production (1965-67)
Vice President, Production and Operation (1967-71)
Senior Vice President, Production and Transmission (1971-Present)

Organizations and Committees:

North Carolina Rotary Club
American Society of Mechanical Engineers
American Nuclear Society
Charlotte Engineers Club
North Carolina Society of Engineers
Edison Electric Institute
Southeastern Electric Exchange
Air Pollution Control Association
Atomic Industrial Forum
Charlotte Chamber of Commerce
Southeastern Electric Reliability Council Technical Advisory Committee
Virginia-Carolinas Reliability Sub-Region Executive Committee
Newcomer Society
North Charlotte YMCA, Director
Charlotte Opera Association, Director
Mercy Hospital, Director
Arts and Science Council, Director

Name: L. C. Dail

Position: Vice President, Design Engineering

Education: 1949 B. Civil Engineering
North Carolina State University

Certification/Licenses:

Registered Professional Engineer in North and South Carolina

Experience:

U.S. Bureau of Reclamation (1949-50)

Tennessee Valley Authority (1950-53)

Easterby and Mamaw, Inc. (1953)

Duke Power Company

Various assignments in the Design Engineering Department (1953-65)

Principal Civil Engineer (1965-72)

Chief Engineer, Civil and Environmental Division (1972-78)

Vice President, Design Engineering (1978-Present)

Organizations and Committees:

American Society of Civil Engineers

Charlotte Engineers Club

American Nuclear Society

American Institute for Steel Construction

American Concrete Institute

Name: R. L. Dick

Position: Vice President, Construction

Education: 1949 B. Civil Engineering
North Carolina State University

Certification/Licenses:

Registered Professional Engineer in North and South Carolina

Experience:

Duke Power Company
Various assignments in the Construction Department (1949-71)
Vice President, Construction (1971-Present)

Organizations and Committees:

American Society of Civil Engineers
American Society of Mechanical Engineers
American Nuclear Society
U.S. Committee on Large Dams
N.C. Society of Engineers

Name: W. O. Parker, Jr.

Position: Vice President, Steam Production

Education: 1946 B.S. Mechanical Engineering
Illinois Institute of Technology

Certification/Licenses:

Registered Professional Engineer in North Carolina

Experience:

Duke Power Company

Various assignments at Cliffside Steam Station (1947-55)
Operating Assistant (1955-59)
Steam Production Engineer (1959-66)
Chief Production Engineer (1966-67)
Assistant Manager, Steam Production (1967-72)
Manager, Steam Production (1972-73)
Assistant Vice President, Steam Production (1973-74)
Vice President, Steam Production (1974-Present)

Organizations and Committees

American Society of Mechanical Engineers
Charlotte Engineers Club
North Carolina Society of Engineers
Southeastern Electric Exchange
ASME Boiler and Pressure Vessel Committee
ASME Section XI Subcommittee on Inservice Inspection
ASME Section XI Subgroup on Water Cooled Systems
Edison Electric Institute Prime Movers Committee
American Nuclear Society
Charlotte North Rotary Club