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12.1 SUMMARY DESCRIPTION

12.1.1 General

The Watts Bar Nuclear Plant will be designed, constructed, and operated to produce electric power reliably and economically, and with safety to the public and plant personnel. 2

12.1.2 Organization Relationships

Westinghouse has agreed to supply the Tennessee Valley Authority (TVA) with a fully licensable and operable nuclear steam supply systems. The TVA Division of Engineering Design serves as the plant architect engineer and principal contractor for the balance of plant equipment and is responsible for fulfilling the technical requirements of the nuclear steam supply system contracts. The TVA Division of Construction is responsible for constructing the plant in accordance with design specifications supplied by the Division of Engineering Design. 2

The TVA Division of Power Production is responsible for the safe operation and maintenance of the plant in compliance with the operating licenses, technical specifications, and other requirements.

Plant organization and responsibilities for normal plant operation are described in paragraph 12.2.1. Plant organization and responsibilities during preoperational testing, startup, and initial operation are described in paragraph 12.2.2. All operations are performed by assigned plant personnel of the Division of Power Production.

Westinghouse supplies TVA with preoperational and startup test procedures for the nuclear steam supply system. The Division of Engineering Design

provides test-scoping documents and acceptance criteria for the balance of plant systems. The Division of Construction is responsible for pre-operational testing including preparation of a detailed set of test procedures. The Division of Power Production assumes responsibility for plant startup testing and operation commencing with fuel loading and prepares detailed startup test procedures and operation manuals.

The Watts Bar Nuclear Plant will be staffed consistent with TVA's policy for existing steam plants, but taking into consideration the additional nuclear training and experience which is necessary for a nuclear station. Support in the areas of operation, maintenance, and engineering is provided by the Division of Power Production's central office staff. Consultation in other areas such as design improvements, radiological safety, and reactor physics is available from other TVA divisions.

12.1.3 Operation

Normal and abnormal operations are carried out according to standard practices and written operating procedures which conform to the Operational Quality Assurance Program Plan (Appendix A.4). Normal operating procedures for planned operations are prepared for systems and the integrated plant. Emergency operating procedures written for the general categories of accidents or abnormal occurrences which could lead to the injury of plant personnel or the public. A Site Emergency Plans manual is a precautionary planning document which delegates authority and responsibility, and outlines plans of action to protect the public, plant employees, and equipment in case of incidents.

Plant maintenance also adheres to standard practices and detailed procedures which conform to the Operational Quality Assurance Program Plan.

Refueling operations are carried out according to detailed procedures to ensure a safe and orderly refueling. Each fuel loading or unloading step is done in accordance with strict administrative and procedural controls. Fuel inventory and control measures are used in order that all special nuclear material is accounted for at all times during refueling and day-to-day operations.

Records reflecting plant operation, maintenance, tests, and inspections are maintained to support plant operations and to show compliance with the plant licenses.

12.2 ORGANIZATION AND RESPONSIBILITY

12.2.1 Plant Operation, Organization, and Responsibility

General

TVA is a corporate agency of the Federal Government whose major policies, programs, and organization are determined by a full-time, three-member Board of Directors. Members of the Board are appointed by the President and confirmed by the Senate for 9-year terms. The general organization of the Tennessee Valley Authority is shown in Figure 12.2-1.

The Division of Power Production within the Office of Power is responsible for operating and maintaining TVA's power plants. The organizations of the Office of Power and the Division of Power Production are shown in Figures 12.2-2 and 12.2-3, respectively.

Plant Organization

The Watts Bar Nuclear Plant organization chart is shown in Figure 12.2-4. The principal groups that function directly under the supervision of the plant superintendent and assistant plant superintendent are the operations section, the power plant results section, the mechanical maintenance section, and the electrical maintenance section. Staff services are provided by an Administrative Staff and a Radiological Hygience Group. The latter is under the administrative supervision of the TVA Office of Health and Environmental Science. The Watts Bar Plant organization follows the pattern developed through experience and in use at all TVA steam generating plants.

Plant Superintendent

The plant superintendent is responsible for the management of the Watts Bar Nuclear Plant. He is responsible for safeguarding the general public

and station personnel from radiation exposure, and for adherence to all requirements of the operating licenses and technical specifications. The plant superintendnet shall have 10 years of responsible power plant experience, of which a minimum of 3 years shall be nuclear power plant experience. A maximum of 4 years of the remaining 7 years of experience may be fulfilled by academic training on a one-for-one time basis. This academic training shall be in an engineering or scientific field generally associated with power production. The plant superintendent shall have acquired the experience and training normally required for examination by the AEC for a Senior Reactor's License whether or not the examination is taken.

If the assistant plant superintendent meets the nuclear power plant experience and AEC examination requirements established for the plant superintendent, the requirements of the plant superintendent may be reduced, so that only 1 of his 10 years of experience need be nuclear power plant experience and he need not be eligible for AEC examination.

The plant superintendent or the assistant plant superintendent should have a recognized baccalaureate or higher degree or the equivalent in an engineering or scientific field generally associated with power production.

Assistant Plant Superintendent

The assistant plant superintendent assists the plant superintendent in planning, coordinating, and directing the plant activities. In the absence of the plant superintendent, he is responsible for management of the plant activities.

The assistant superintendent must have a good knowledge of the nuclear processes involved in the generation of steam, reactor safety, and control systems. He shall have a minimum of 8 years responsible power plant experience of which a minimum of 3 years shall be nuclear plant experience.

A maximum of 4 years of the remaining 5 years of the power plant experience may be fulfilled by satisfactorily completing academic or related technical training on a one-for-one time basis. A degree in science or engineering is desirable. He or the plant superintendent shall be capable of fulfilling the requirements for a Senior Reactor Operator License whether or not the examination is taken. If the plant superintendent has the required 3 years nuclear plant experience, the requirements of the assistant plant superintendent may be reduced so that only 1 of his 8 years of experience needs to be nuclear plant experience.

Operations Section

The operations section is responsible for all plant operations. It provides operating personnel for the preoperational testing, fuel loading, startup, and operational testing. It is responsible for coordinating and scheduling the training program for all operations personnel. It provides the nucleus of emergency teams such as the plant rescue and fire fighting organizations.

Within the operations section are five shift crews. The minimum shift crew for Unit 1 will consist of the shift engineer, one assistant shift engineer, one unit operator, and three assistant unit operators. One additional assistant shift engineer, one additional unit operator, and one additional assistant unit operator will be required for two-unit operation. Additional operators are assigned, as required, during fuel handling and other operations.

A licensed senior operator will be on duty at the station at all times. There will also be one licensed operator in the control room for each reactor that is not in the shutdown mode, or when any possibility of reactivity addition to the core exists. Plant management and technical support will be present or on call at all times.

The operations section is under the direction of the operations supervisor. He is assisted in all phases of operation by an in-line assistant operations supervisor.

Operations Supervisor

The operations supervisor is responsible for the safe and efficient operation of the station in accordance with the operating licenses, technical specifications, and approved procedures. He is responsible for the preparation and maintenance of up-to-date operating procedures and the preparation of operating records. He is also responsible for operator training programs and operating personnel schedules and is charged with the responsibility of keeping the plant superintendent fully informed in all matters of operating significance. He shall have a minimum of 8 years of responsible power plant experience of which a minimum of 3 years shall be nuclear power plant experience. A maximum of 2 years of the remaining 5 years of power plant experience may be fulfilled by satisfactory completion of academic or related technical training on a one-for-one time basis. At the time of initial core loading or appointment to the active position, the operations supervisor shall hold a Senior Reactor Operator's License. The required nuclear experience for this position may be reduced to 1 year, and the AEC licensing requirements may be waived if the assistant operations supervisor has the nuclear plant experience and holds a Senior Reactor Operator's License.

Assistant Operations Supervisor

The assistant operations supervisor assists his supervisor in reviewing, coordinating, and planning the activities of the operations section. In the absence of the operations supervisor, he assumes the responsibilities of that position. At the time of initial core loading or appointment to the active position, the assistant operations supervisor shall have a minimum of 6 years of responsible power plant experience, of which a minimum of 1 year shall be nuclear plant experience. A maximum of 3 years of the remaining 5 years of power plant experience may be fulfilled by satisfactory completion of academic or related technical training on a one-for-one time basis.

Shift Engineer

The shift engineer on duty is in direct charge of the plant, including the startup, operation, and shutdown of the reactors, turbo-generators, and their auxiliaries.

In addition to the normal shift operating personnel under his supervision, the shift engineer has control over the actions of other personnel while they are involved with plant systems or components. He has the prerogative of instituting immediate action in any given situation to eliminate difficulties or remove equipment from service to preclude violation of the operating licenses, technical specifications, or to avert possible injury to personnel or equipment.

In general, the shift engineers will have worked up through the ranks and will have become qualified for their supervisory position by fulfilling the requirements of TVA's formal operator training plan. This is a comprehensive work-study training and advancement program with rigorous qualifying examinations administered by a central accrediting committee. The program builds on a foundation of 2 years technical education in the operation of steam-electric generating stations. Satisfactory completion of technical assignments, in-grade service period requirements, and formal examinations at each level of advancement assure competence in both technical and supervisory ability. Specialized training is used to supplement work experience, as required, to ensure that nuclear knowledge is adequate for the responsibilities of his position. At the time of initial core loading or appointment to the active position, the shift engineer shall have a high school diploma or its equivalent, and 5 years of responsible power plant experience of which a minimum of 1 year shall be nuclear plant experience. He shall hold an AEC Senior Reactor Operator's License. 11 3

Power Plant Results Section

The Power Plant Results Section is responsible for providing technical direction and staff assistance in the areas of nuclear, mechanical, instrumentation, and chemical engineering. Responsibilities of this section include plant and equipment performance tests, inplant fuel management, waste management, chemistry control, and instrumentation maintenance.

The Power Plant Results Section carries out a comprehensive program of plant tests, studies, and investigations for the purpose of monitoring the reactor, engineered safeguards, and plant operating conditions to assure compliance with the operating licenses and technical specifications and to improve the efficiency of the plant. This includes the coordination of the surveillance test program with the other plant sections. The Power Plant Results Section is under the direction of the power plant results supervisor. He is assisted by an inline assistant, a chemical engineer, an instrument engineer, a mechanical engineer, a nuclear engineer, and engineering associates.

The power plant results supervisor shall have a minimum of a bachelor's degree in engineering or science and 4 years of responsible power plant experience of which 2 years shall be nuclear plant experience.

3

The assistant power plant results supervisor shall have a minimum of a bachelor's degree in engineering or science and 2 years of nuclear plant experience.

If the power plant results supervisor or his assistant meet the 2-year nuclear plant experience requirement, the qualifications of the other may be reduced such that only 1 year of nuclear plant experience is required.

At the time of initial core loading or appointment to the active position, the instrument engineer shall have a bachelor's degree in science or engineering and a minimum of 1 year's experience in the field of instrumentation. Six months of this experience shall be in nuclear instrumentation and control.

At the time of initial core loading or appointment to the active position, the chemical engineer shall have a bachelor's degree in science or engineering and a minimum of 1 year's experience in radiochemistry.

At the time of initial core loading or appointment to the active position, the nuclear engineer shall have a minimum of a bachelor's degree in engineering or the physical sciences and 2 years of experience in such areas as reactor physics, core measurements, core heat transfer, and core physics testing programs. When the assistant power plant results supervisor meets these experience requirements, the experience requirement of the nuclear engineer may be reduced to 6 months' nuclear plant experience. 3

The radiochemical analysis and other engineering aides are high school graduates with a minimum of 2 years' experience in their respective fields. Specialized nuclear training is given to supplement their fossil plant experience as required by their specific assignments.

Each instrument mechanic has a minimum of 3 years' experience in his craft and is a skilled journeyman. Specialized training in plant process instrumentation and control systems supplements their fossil plant experience.

12.1.2.5 Power Plant Maintenance Section

The Power Plant Maintenance Section is responsible for all electrical and mechanical maintenance work and inspections. The section develops and carries out a preventative maintenance program that assures all repair work and replacement parts are consistent with the intent of applicable codes and basic requirements of the original equipment. The section maintains a record file on all mechanical and electrical equipment, inservice tests, and equipment inspection and maintenance reports. 3

The Power Plant Maintenance Section is under the direction of the power plant maintenance supervisor. He is assisted in his work by two inline assistants, the foremen of the various crafts within his organization, and additional engineers as the workload demands.

The power plant maintenance supervisor shall have a minimum of 7 years of responsible power plant experience or applicable industrial experience, including at least 1 year of nuclear plant experience. A maximum of 2 years of the remaining 6 years of power plant or industrial experience may be fulfilled by satisfactory completion of academic or related technical training on a one-for-one time basis.

The assistant power plant maintenance supervisors (electrical and mechanical), in their areas of responsibility, shall have nondestructive testing familiarity, craft knowledge, and an understanding of electrical, pressure vessel, and piping codes.

Each TVA technician and repairman is a skilled journeyman. These experienced journeymen will predominantly be transferees from other TVA generating plants and installations. The primary source of new journeymen is the TVA apprenticeship program. This program, jointly administered by a TVA labor-management council, normally requires in excess of 4 years for completion. 3
The program requires assignments designed so that he will develop skills equal to the recognized journeyman standard. Related classroom and correspondence lesson assignments provide the technical information needed in the actual work being done on the job.

The TVA Service Shops Section, located at Muscles Shoals, Alabama, is the principal offsite source of manpower for planned or emergency plant outages. This section provides shop and field services for major repairs at all TVA generating plants. The work force of this section varies as the workload demands, but it usually consists of approximately 50 electricians, 54 machinists, 13 machinist welders, 2 blacksmiths, 9 boilermakers, 9 iron workers, and 7 steamfitters.

Industrial and Radiological Hygiene Group

The Industrial and Radiological Hygiene Group is responsible for industrial hygiene and radiological health activities at the plant. It develops and applies radiation standards and procedures; reviews proposed methods of

plant operation; participates in development of plant documents; and assists in the plant training program, providing specialized training in radiation protection. It conducts comprehensive environmental monitoring before, during, and after plant startup and provides radiological health coverage for all operations, including maintenance, fuel handling, waste disposal, and decontamination. It is responsible for personnel and in-plant radiation monitoring, and maintains continuing records of personnel exposures, plant radiation, and contamination levels. It appraises and advises on potentially harmful factors in the working environment other than radiation, including fumes, gases, dusts, and other toxic agents - all in relation to identified and approved standards.

The group is under the administrative supervision of the Chief, Industrial and Radiological Hygiene Branch, in the TVA Office of Health and Environmental Science.

Health Physicist

The health physicist is the onsite supervisor of the Industrial and Radiological Hygiene Group and is responsible for direction of an adequate program of radiological hygiene surveillance for all plant operations involving potential radiation hazards. He keeps the plant superintendent informed at all times of radiological hazards and conditions related to potential personnel exposure, contamination of site and environs. His duties include training and supervising health physics technicians; planning and scheduling monitoring and surveillance services; maintaining current data files on radiation and contamination levels, personnel exposures, and work restrictions; and ensuring that operations are carried out within the provisions of developed radiological hygiene standards and procedures. He provides monitoring assistance and technical advice to the plant operations and medical staff in emergencies where radiation and contamination hazards are involved.

The health physicist shall have a bachelor's degree in science or engineering and at least 1 year of experience in applied health physics work with nuclear reactors. 3

Administrative Staff

The administrative staff, under the supervision of the administrative officer performs management service functions and clerical services for the plant.

Services Available from Offsite TVA Organizations

The basic responsibility for operating the Watts Bar Nuclesr Plant rests with the plant superintendent. Other TVA groups provide services as required to supplement existing facilities or staff capabilities at the site. The organizations principally involved are as follows:

Division of Power Production

This division provides general supervision, technical, and management for the plant. Included within the division are the Nuclear Operations Coordinator, the Plant Engineering Branch and the Power Plant Maintenance Branch.

The nuclear operations coordinator has responsibility for coordinating with the nuclear plant superintendents all activities of the nuclear generating plants in the TVA power system and all appurtenant nuclear plant system facilities. He coordinates the development of operating guidelines to ensure that the nuclear plants are operated to provide a high degree of safety to the public and plant employees, along with maximum possible efficiency and economy in the generation of electric power.

The nuclear operations coordinator is responsible for reviewing the designs and plans for new nuclear generating plants and alterations or additions to existing plants, with special attention to operating features. The coordinator makes recommendations on the acceptance or modification of such plans on the basis of licensing considerations, overall safety, and operating economy. During construction and initial operation of new plants or of new equipment in old plants, the nuclear operations coordinator coordinates activities through the nuclear plant superintendents, including preoperational,

startup, and acceptance tests with the construction organization, and the equipment manufactureres. The coordinator is responsible for coordinating the activities of the nuclear plants with other branches and divisions in such areas as licensing, fuel management, and waste disposal.

The nuclear operations coordinator analyzes reports of abnormal equipment operation or faults to determine the initiating cause so that remedial measures can be taken. He also assists in training the plant staff and evaluating training programs.

The nuclear operations coordinator nmeets both the definitions and qualifications of engineer-in-charge as set forth in ANSI 18.1.

5

The Power Plant Maintenance Branch provides services from the central office staff on electrical and mechanical maintenance problems and major shop services from its central service shops. The staff of this branch meets ANSI 18.1's "key staff specialists" definition. These key staff specialists are:

Chief, Power Plant Maintenance Branch
Staff Nuclear Engineer
Supervisor, Nuclear & Metalurgy Unit
Supervisor, Plant Electrical Section
Supervisor, Service Shops Section
Supervisor, Plant Maintenance Section

The Plant Engineering Branch provides a variety of engineering services for all generating plants. For the nuclear plants, it provides technical assistance in the area of nuclear engineering, chemical engineering, instrument engineering, and testing.

The Nuclear Section of the Plant Engineering Branch is responsible for developing and maintaining standards for all onsite nuclear fuel operations, assisting in training nuclear plant staff, developing nuclear plant startup test programs, and providing engineering manpower and analysis for reactor
5 and other nuclear-oriented problems.

The staff of the Plant Engineering Branch meets ANSI 18.1's "key staff specialist" definition. These key staff specialists are:

Chief, Plant Engineering Branch
Staff Nuclear Engineer
Supervisor, Nuclear Section
Supervisor, Chemical Section
Supervisor, Instrumentation Section
Supervisor, Testing Section

Division of Power Resource Planning

This division provides technical assistance and coordination services in the areas of nuclear fuel supply, management, and reprocessing; operating and nuclear material licenses; safeguards and environmental programs; and quality assurance inspection and testing programs.

The Nuclear Engineering Branch is responsible for the logistics, accountability, and safeguarding of nuclear materials, reactor fuel, fuel materials, and residual fuel materials removed from reactors. It develops fuel management programs and techniques; and conducts continuing analyses and evaluations of reactor power distributions and fuel performance. It is responsible for test program review, and provides safety review and assurance of compliance; it conductcs audits of the operational quality assurance program. It provides inplant manufacturing inspection and quality assurance actions pertaining to nuclear fuel, such as refinement and processing of nuclear fuel materials, fabrication of nuclear fuel assemblies, and reprocessing of spent fuel. It also coordinates the securement of construction permits, nuclear material and fuel licenses, and operating licenses.

The Power Supply Planning Branch determines nuclear fuel supply requirements, develops fuel economic management supply programs, and coordinates nuclear fuel cycle supply activities.

The Fuels Planning Branch is responsible for activities relating to the supply of nuclear fuel materials (yellowcake).

The Power Research and Development Branch evaluates environmental effects of power facilities, coordinates related control measures, and carries out related tasks and studies.

Division of Power System Operations

This division provides the services of its central laboratory and technical staff. In addition, field test engineers are provided for chemical and laboratory tests, and for solution of special technical problems. Engineers and technicians from this division are assigned to the plant and are responsible for the maintenance and testing of the relaying associated with the transmission system.

Division of Transmission Planning and Engineering

This division furnishes advice and assistance regarding the engineering and design of the electrical transmission lines, substation, and communication facilities.

Division of Power Resource Planning

This division, through its Nuclear Engineering Branch, is responsible for a variety of analytical and coordination activities involving nuclear technology in nuclear plant operations. These include overall review of test programs, safety review, preparation and audit of Quality Assurance programs, nuclear fuel management, analysis and evaluation of reactor and fuel performance, coordination of nuclear materials management and safeguards programs, and consultation on technical problems.

Division of Engineering Design

The Division of Engineering Design is responsible for designing all TVA power plants and other major facilities. The services of this organization are available for advice and consultation on all engineering problems, and for carrying out the design of major plant changes or additions which may be required.

Division of Construction

The services of the Division of Construction, of the Office of Engineering Design and Construction, are available for any major plant construction that may be required at the site.

Division of Chemical Development

This division can furnish technical advice and services on chemical and chemical engineering problems, and provides chemical engineering development services in certain fields.

Office of Health and Environmental Science

The Office of Health and Environmental Science, through its Division of Medical Services, provides health services at the plant, participates in establishing radiological health protection standards, and acts as liaison with local, state, and national health agencies in developing an emergency medical plan. Through its Division of Environmental Research and Development, it is responsible for developing and applying the engineering and health physics aspects or radiological health services required in the planning and operation of TVA's nuclear plants. Through the Industrial Hygiene and Safety Staffs, the Office provides advice and technical assistance in the planning, developing, and application of measures for the prevention and control of non-radiological hazards in plant operations.

12.2.2 Nuclear System Startup Organization and Responsibility

The Tennessee Valley Authority has overall responsibility for planning, scheduling, carrying out, and documenting the plant startup programs. All aspects of plant startup will conform to the requirements of the operational quality assurance program as described in Appendix A-4.

Westinghouse provides assistance in support of the following operations:

1. The storage, protection, installation, cleaning, initial calibration, testing, and operation of the nuclear system equipment, instrumentation, and material supplied by Westinghouse.

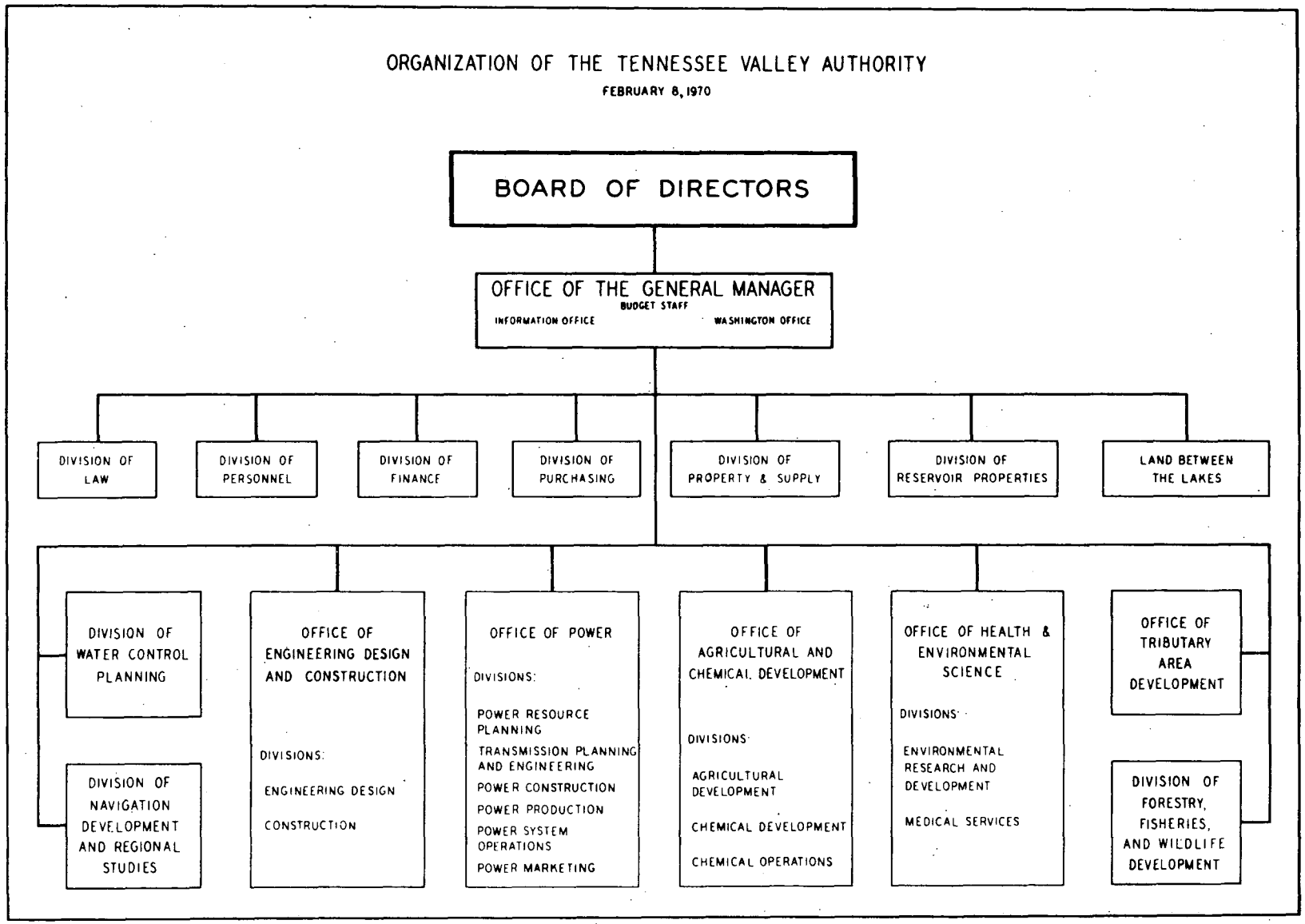
2. The preoperational testing of the nuclear plant systems in which Westinghouse supplied equipment is installed. This includes the right of review and comment on the preoperational testing of all plant systems that are related to the safety and performance of the nuclear system.

3. All operational check-outs of the nuclear system, from the initial fuel loading and startup to the completion of the warranty demonstration test.

The TVA Division of Engineering Design is primarily responsible for scoping the preoperational test program. The Division of Construction and the Westinghouse Company assist by providing details as required. Test procedure specifications for TVA-designed systems are prepared by the Division of Engineering Design and are reviewed by Westinghouse. Westinghouse provides the preoperational test procedures, which are reviewed and approved by the Division of Engineering Design, for all items within the nuclear steam supply system.

The Division of Construction finalizes and approves all detailed preoperational test procedures, and is responsible for scheduling and executing each preoperational test. Operators and data takers are supplied by the Division of Power Production and technical assistance is received from Westinghouse representatives. The Division of Construction will analyze, evaluate, and approve the test data, with assistance from Westinghouse and the Division of Engineering Design. Final acceptance of test results will be made by the Division of Engineering Design.

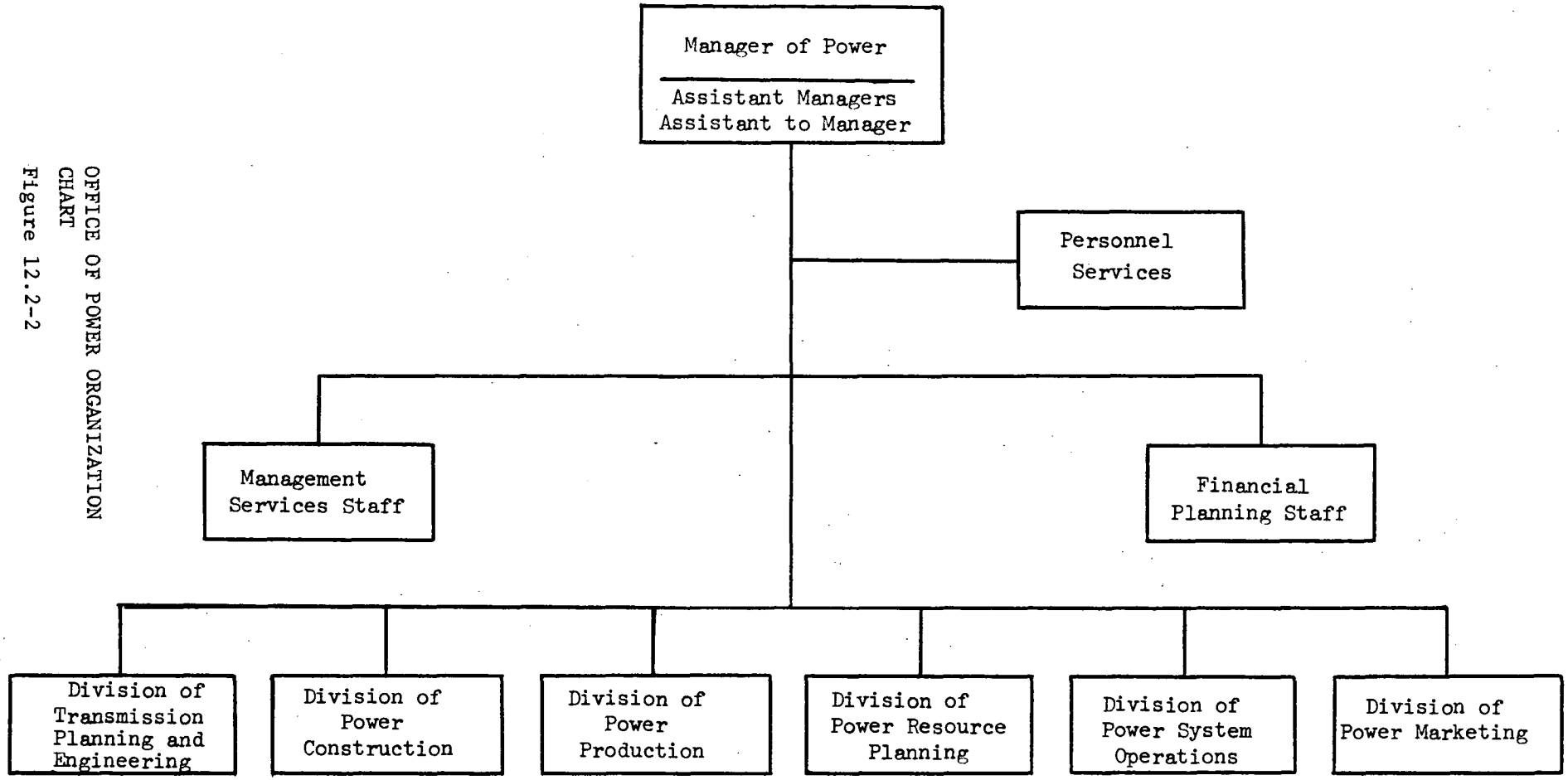
The TVA Division of Power Production is responsible for the overall conduct of the startup tests (fuel loading and power tests). Technical assistance in the tests is provided by Westinghouse, but the plant superintendent is responsible for management and safety of operation at all times. Startup test procedures provided by Westinghouse will be reviewed and approved by the Division of Engineering Design while those prepared by TVA will be reviewed by Westinghouse. The plant superintendent will have final approval authority on all startup test procedures before use. With the assistance of Westinghouse and the Division of Engineering Design, the results of each startup test will be evaluated and approved by the Division of Power Production. Overall test program review is provided by the Nuclear Engineering Branch of the Division of Power Resource Planning. Final acceptance of these test results is the responsibility of the Division of Engineering Design.



WATTS BAR NUCLEAR PLANT PRELIMINARY SAFETY ANALYSIS REPORT

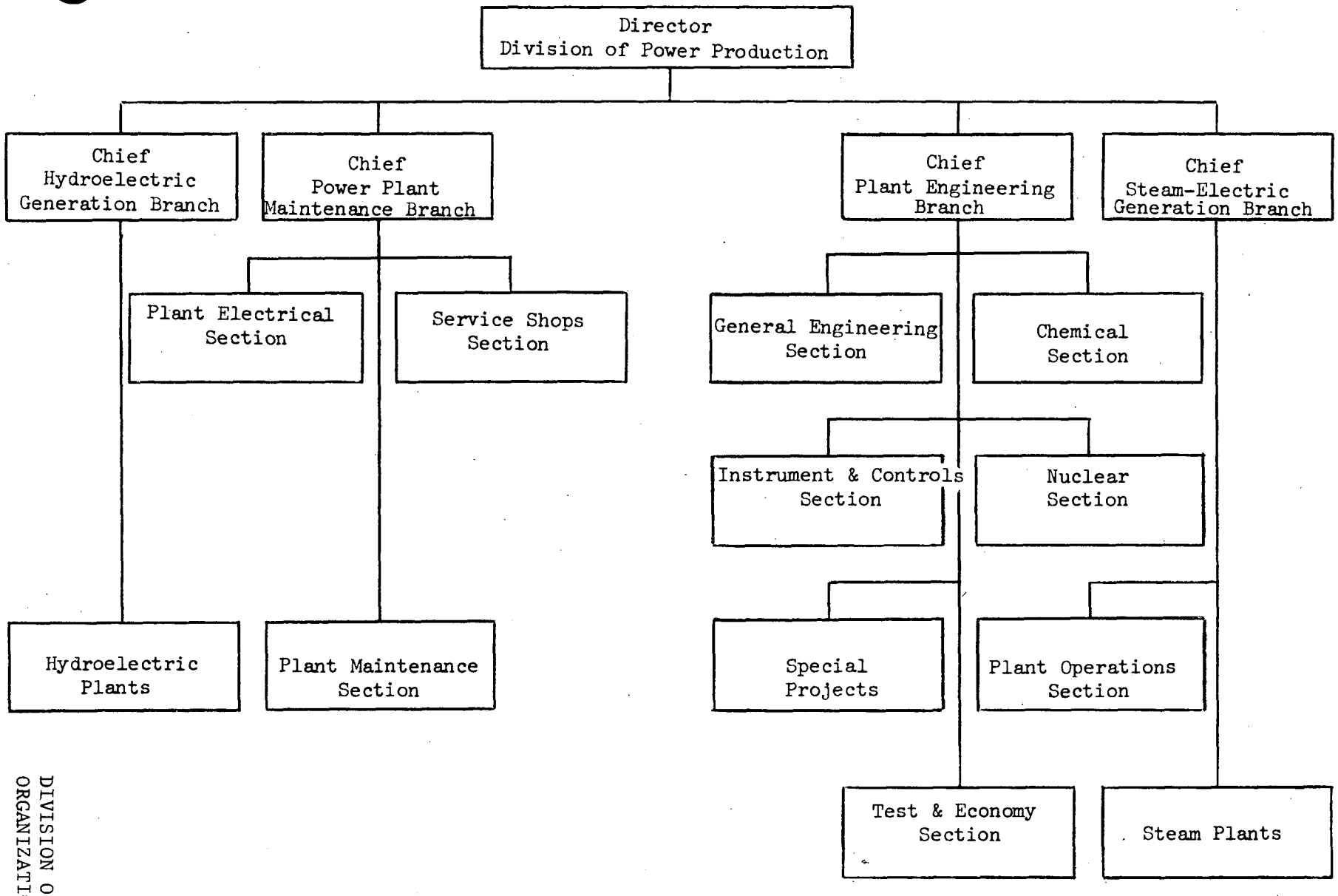
Organization of the Tennessee Valley Authority

FIGURE 12.2-1

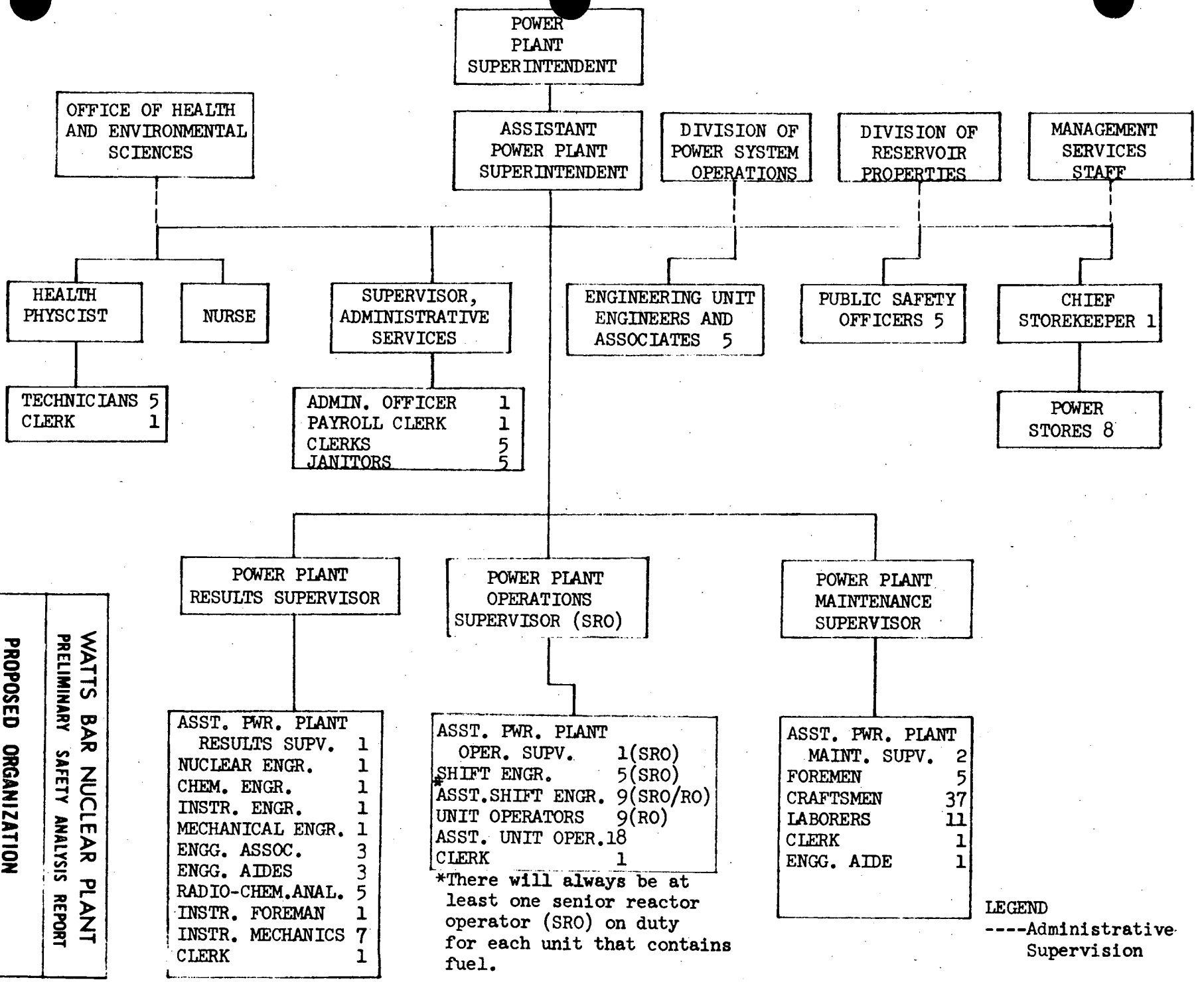


OFFICE OF POWER ORGANIZATION CHART

Figure 12.2-2



DIVISION OF POWER PRODUCTION
ORGANIZATIONAL CHART
Figure 12.2-3



WATTS BAR NUCLEAR PLANT
PRELIMINARY SAFETY ANALYSIS REPORT

PROPOSED ORGANIZATION FOR TWO UNITS

FIGURE 12.2-4

12.3 Training

At the time of manning Watts Bar Nuclear Plant, TVA should have a surplus pool of highly trained nuclear plant operating personnel at the Browns Ferry and Sequoyah Nuclear Plants. This pool will be the primary source of personnel for Watts Bar. The TVA student operator training program and replacement training at Browns Ferry and Sequoyah will ensure no loss of operator efficiency at those plants due to transfer of personnel to Watts Bar. The secondary source of operators for Watts Bar will be the large pool of operators in the conventional coal-fired plants in the TVA system. Individual training needs will be established by carefully examining the individual's experience and previous training and comparing these with the job requirements. The Division of Power Production will comply with the requirements of ANSI N18.1-1971 in selecting and training Watts Bar power plant personnel. 3

Figure 12.3-1 presents a proposed training schedule for two units at Watts Bar Nuclear Plant. It is planned that the following personnel will be licensed in accordance with the requirements of 10 CFR 55 before initial fuel loading in unit 1: operations supervisor, assistant operations supervisor, at least 5 shift engineers, and at least 5 assistant shift engineers. The plant superintendent or the assistant superintendent will obtain the training required for a Senior Reactor Operator's License (SROL). It is planned to obtain a Reactor Operator's License (ROL), for at least 5 unit operators during startup testing of this unit. 3

The normal operations shift staff for the 2-unit plant will consist of 9 operations personnel as follows: 1 shift engineer (SROL), 2 assistant shift engineers (SROL)*, 2 unit operators (ROL), and 4 assistant unit operators. In addition, there will be 1 health physics technician on all shifts. 3

* Minimum staffing requirements provide for 1 operator with a SROL for each operating reactor. This allows an operator with a ROL to fill one of the assistant shift engineer positions.

The nuclear training program which will provide the necessary training for Watts Bar plant employees is outlined in the following paragraphs. This program is based on the provisions of the TVA Operational Quality Assurance Manual.

12.3.1 Initial Training

The objective of the initial training program for personnel is to provide the nuclear plant's personnel with the knowledge and skill required for safe and efficient operation of the plant. In achieving this objective, TVA expects to meet all AEC licensing requirements. Individual training needs are established by comparing job requirements with individual experience.

Members of the plant maintenance and engineering support groups will receive specialized courses necessary to operate the plant. Key supervisors, engineers, and craftsmen will receive training necessary to acquire basic knowledge of all plant systems and integrated plant operation. Training visits to operating nuclear plants within and outside TVA will be scheduled as needed.

12.3.2 Licensed Operator Training 3

(a) Senior Reactor Operator

No Nuclear Experience

The following training courses are considered a minimum for initial training of personnel for a senior operator position.

1. Basic Nuclear Course - This course shall include basic atomic and nuclear physics; nuclear reactor principles, including neutron and reactor physics, reactor kinetics, reactor control, reactor instrumentation, and reactor materials; chemistry as applied to nuclear plants; reactor core performance as applied to heat generation, DNB, linear heat rate, MCHF, hot channel factors; and radiation protection and radiation safety.

2. Plant Technology Course - This course shall introduce the operator to plant equipment and systems. Individual components, systems, and controls will be described in detail from the operational point of view. The course may be combined with other training so that it does not necessarily stand alone. This does not relieve the plant of the responsibility to cover these subjects in the same depth a separate course would do.

3. Training Period at an Operating Reactor in connection with Simulator Training - This course will take the operator with little or no knowledge of reactor systems and give him sufficient background to allow him to understand fully the operationally oriented training given during the simulator training. The course shall be of sufficient duration to ensure the operator can learn the plant in enough detail to obtain the maximum benefit from the simulator training.

4. Simulator Training - The simulator training program shall be based on a large nuclear station similar to the one the trainee will ultimately be expected to operate. The simulator shall be a sophisticated nuclear power plant simulator that very closely simulates an actual nuclear unit complete with reactor and associated safety systems, and turbogenerator unit complete with auxiliary equipment. Electrical and other support systems shall be simulated in sufficient detail to ensure realism in simulator response to expect actual plant normal and abnormal occurrences. 3

5. On-the-job Training at an Operating Plant - In lieu of a simulator program, an operator may be assigned to an operating plant for on-the-job training leading to a "hot" license on the plant where training is taking place. The training shall be of sufficient duration and depth to provide reasonable assurance the trainee can pass the AEC examination on the plant. AEC requirements for license eligibility regarding startups or plant evolutions shall be completed during this training.

Nuclear Experience

This candidate for senior reactor operator license will have either an operator license on an operating plant or be eligible for a "cold" license based on extensive military or utility experience. The background of each individual shall be carefully examined to determine training needs. As a minimum, he will complete an approved simulator course or be "hot"-licensed on an operating plant.

(b) Reactor Operator

No Nuclear Experience

The following training is considered a minimum for initial training of personnel for licensed reactor operator position.

1. Basic Nuclear Course - This course shall follow the same outline as that for senior reactor operator. Some latitude is allowed, however, in depth of material presented and in knowledge required at the completion of the course.

2. Plant Technology Course - This course should be the same as that presented for senior reactor operator.

3. Plant Systems and Operations Training - This is a combination work and training period and is intended to cover all systems, components, and operating procedures for the plant. The operator will learn system requirements, design features, parameters, and modes of operation. Throughout this training, the operator's progress will be monitored by more experienced personnel to ensure the operator is obtaining maximum benefit.

4. Control Board Experience - Each operator shall obtain experience at the unit control board before taking the AEC license examination. AEC requirements for license eligibility regarding startups or plant evolutions shall be completed during this period.

3

Nuclear Experience

These candidates for operator licenses will have either an operator license on an operating reactor or experience as an assistant unit operator in an operating nuclear plant. The background of each individual shall be carefully examined to determine training needs. As a minimum, each candidate for an operator's license shall complete the Plant Systems and Operations Training and Control Board.

12.3.3 Operator Replacement Training

TVA follows a comprehensive work-study training and advancement program designed to supply qualified operating personnel for all levels of responsibility. All training courses have frequent examinations during the course, and a final examination is required at completion. Completion of related technical assignments, in-grade service period requirements, and rigorous qualifying examinations administered by a central accrediting committee before advancement to the next higher position ensure the required level of proficiency in all operating positions. Replacement personnel will be drawn from reserves of qualified candidates. Supplemental nuclear training will be provided as required. 3

12.3.4 Operator Retraining

Interest is stimulated and continual upgrading is afforded by preparation for the qualification examination leading to the next higher position. Also, significant retraining is provided by the day-to-day operation in a two-unit plant. The effect of these influences is observed and evaluated continuously. In addition, individual performance and experience of the licensed operators will be reviewed every two years. If additional retraining is judged necessary, it will be provided through special courses, refresher exercises at a simulator, or by special exercises on one of the units at Watts Bar or Sequoyah.

12.3.5 Engineer Training

The academic and experience backgrounds of each engineer shall be evaluated by the responsible supervisor to determine what training is needed to enable the engineer to carry out his responsibilities at the plant. For the following positions, the listed subjects shall be covered in training courses unless previous experience or training on the subjects has been obtained.

(a) Instrument Engineer

Reactor control system, reactor protection system, computer and plant data logging system, nuclear instrumentation, radiation monitoring systems, turbogenerator control, and feedwater control system.

(b) Nuclear Engineer

Reactor physics testing criteria and techniques, plant instrumentation and control systems, data acquisition systems, power distribution optimization and control, thermal hydraulic analysis, and fuel management.

(c) Chemical Engineer 3

Radiochemistry and process chemistry for the particular plant.

(d) Mechanical Engineer

Basic nuclear reactor principles, reactor systems, and steam power conversion systems.

12.3.6 Technician and Craftsman Training

The training and experience of each individual shall be evaluated by the responsible supervisor to determine what training is needed to enable him to carry out the responsibilities of his position. Each individual in the same classification may not require the same type or amount of training. For the following, the listed subjects shall be covered in training courses as needed to carry out the work of the classification.

(a) Instrumentation Technician, Senior Instrument Mechanics, and Instrument Mechanics

Nuclear power plant process instrumentation, reactor theory, reactor control, nuclear instrumentation, steam power conversion system process control, and health physics.

(b) Chemical Technicians

Nuclear physics, nuclear reactions and radiation, nuclear power plant process chemistry, steam power conversion system process chemistry, radiochemical counting equipment, and health physics.

(c) Craftsmen

Health physics.

12.3.7 Nuclear System Special Training

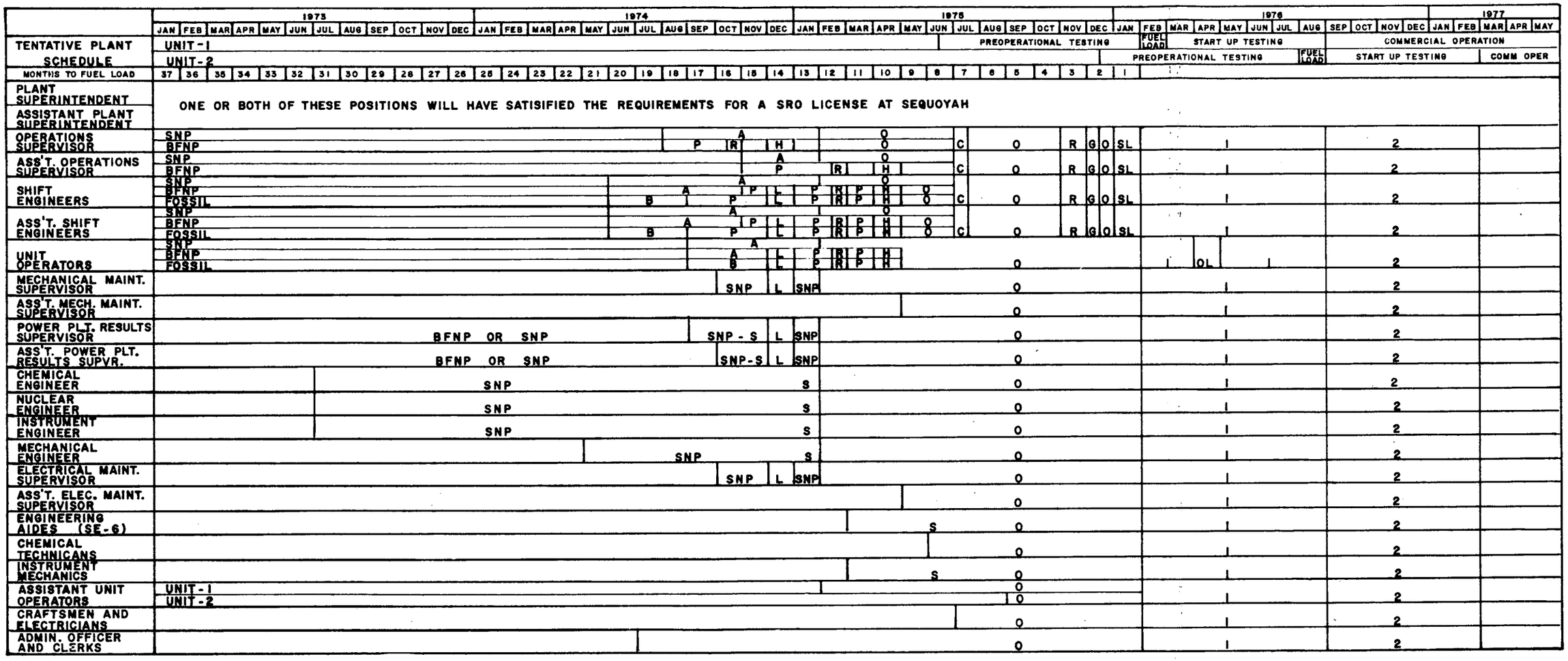
TVA, on a continuing basis, plans and administers training programs for the professional and managerial development of its employees and their supervisors. Relationships are maintained with both local and state educational institutions as well as with the vendors of various items of equipment. Advantage is taken of appropriate seminars, specialized courses, and training activities offered by these groups to keep employees abreast of new developments in power production and safety. 3

12.3.8 Onsite Work-Study Program

This phase, which begins before fuel loading, integrates personnel into their plant assignments. It is conducted under the direction of TVA supervisory personnel. During this period plant personnel participate in the preparation of procedures and manuals, preoperational testing, preoperational checkout of the operation procedures, initial fuel loading, and the initial startup program. The license applicants will participate in further training and examination preparation related to obtaining the required AEC license. All plant personnel will participate in a plant indoctrination and radiation protection course for about 2 weeks.

12.3.9 Scheduling

Figure 12.3-1 presents the tentative training schedule showing the relation of the training to the plant schedule for construction and testing. Because there is a possibility that several persons may be transferred from Sequoyah and Browns Ferry Nuclear Plants, Figure 12.3-1 shows three schedules for the licensed operator positions. The first shows the schedule should the person selected be trained and experienced at Browns Ferry Nuclear Plant, the second is for a similar person from Sequoyah, and the third shows the schedule should the person have no previous nuclear experience. The schedule is tentative and subject to change before submission in the Final Safety Analysis Report. 3



LEGEND

1 - STARTUP TESTS UNIT 1, PREOPERATIONAL TESTS UNIT 2
2 - STARTUP TESTS UNIT 2, COMMERCIAL OPERATION UNIT 1
A - CONTINUE WORK ASSIGNMENT AT PRESENT PLANT
B — BASIC NUCLEAR COURSE AT SEQUOYAH NUCLEAR PLANT
SNP - OBSERVATION TRAINING AND WORK ASSIGNMENT AT SEQUOYAH NUCLEAR PLANT
C - SRO CANDIDATES LECTURES, ON SITE
G - AEC EXAM PREPARATION
L — PLANT TECHNOLOGY COURSE AT SEQUOYAH NUCLEAR PLANT
O - ON-SITE WORK-STUDY ASSIGNMENTS, PARTICIPATION IN TESTS, MANUAL PREPARATION AND PROCEDURE PREPARATION AT WATTS BAR NUCLEAR PLANT
P — TRAINING PERIOD AT AN OPERATING REACTOR IN CONNECTION WITH SIMULATOR TRAINING

SL - SENIOR OPERATORS LICENSE EXAMINATION (COLD)
OL - OPERATORS LICENSE EXAMINATION (HOT)
R - INTENSIVE REVIEW OF NUCLEAR FUNDAMENTALS
H - HOT SENIOR LICENSE EXAMINATION AT SEQUOYAH NUCLEAR PLANT
S - SPECIALIST TRAINING AS REQUIRED

PROPOSED TRAINING SCHEDULE
WATTS BAR NUCLEAR PLANT
FIG. 12.3-1 DATE NOV. 6, 1970

12.4 NORMAL OPERATIONS

12.4.1 General

Day-to-day operations are carried out by the various plant sections. Each section, within its assigned area of responsibility, operates with some degree of independence and freedom from close supervision, yet their actions are closely coordinated to best achieve the common purpose.

The plant superintendent issues, in the form of standard practices, his instructions governing employees actions and establishing standards for plant operation. These instructions contain administrative restrictions and station requirements established to ensure safe operation of the plant within the limits set by the facility licenses and technical specifications. They provide that plant activities will be conducted in a manner to protect the general public, plant personnel, and equipment.

A formalized system of written procedures conforming to the requirements of the Operational Quality Assurance Program Plan (Appendix A.4) is employed in support of the standard practices. Figure 12.4-1 shows the orgainzational structure of these procedures. Procedures covering all plant operations, maintenance work, tests, equipment changes, and other activities which might adversely affect safety are put into effect only after being reviewed by appropriate specialists and written authorization of the plant superintendent. It is his responsibility to ensure that required reviews and approvals are completed before authorizations are issued.

The Plant Operations Review Committee, composed of the plant superintendent, assistant superintendent, the section supervisors and the health physicist, is responsible for initiating and reviewing all proposed changes to plant procedures. On the basis of the recommendations received from this group, the superintendent is responsible for determining if further review is required before approving a change. The plant superintendent is not authorized to approve any change which could result in exceeding the limitations of the operating licenses or technical specifications.

There is, in addition to planned changes in the plant and procedures, the area of accidental or gradual changes in plant equipment characteristics or conditions. Each supervisor and employee has the responsibility to be continually alert for such changes and for reporting them upon detection. The periodic inspection of plant equipment and the continuing review and analysis of operating data from plant logs, instruments, and tests provide regular sources of information on plant conditions.

12.4.2 Normal Operating Procedures

Procedures are prepared for integrated plant operation, system operation, and instrument operation.

The procedures for integrated plant operation outline the principal steps required for startup and shutdown of the reactor, turbine-generator, and supporting auxiliaries as in integral unit.

The system procedures contain preoperational requirements and instructions for startup, operation, shutdown, and anticipated abnormalities of the system concerned.

The instrumentation procedures are similar to system procedures. They cover the normal checkout, operation, and calibration of the nuclear and process control and monitoring systems.

Procedures are supplied for all operational systems and instrumentation which have a significant bearing on nuclear safety.

12.4.3 Emergency Operating Procedures

Emergency operating procedures are written for conditions which are postulated to lead to injury to plant personnel or to the public or to the release of radioactivity in excess of established operating limits. Included are the loss of reactivity control, primary system rupture, and loss of external power.

These procedures contain information describing the incident or conditions, probable indications, automatic actions which occur, immediate operator action, and any subsequent operator action necessary to correct or control the situation.

The primary responsibility for initiating the corrective action rests upon the operator who first becomes aware of the situation. He will then notify his supervisor of the existing condition and the action he has taken. All operating personnel through training and experience have learned to recognize and evaluate impending failures or malfunctions and to initiate proper corrective actions.

The emergency procedures will be used to train the operating personnel and make them aware of the accidents or situations that could occur, and the proper course of action.

12.4.4 Maintenance Procedures

The plant maintenance program is designed to safely and efficiently provide maintenance and repair to keep the plant in good operating order. Maintenance is initiated through work requests and a preventive maintenance program. Safe working conditions are assured by the use of TVA's Hold Order, Clearance and Special Work Permit procedures. Complex maintenance operations require step-by-step performance and therefore are detailed in written procedures. These procedures, covering mechanical, electrical, and instrumentation maintenance will provide information to assure proper coordination of operating and maintenance personnel.

12.4.5 Site Emergency Plans

General

The Site Emergency Plans will contain the precautionary planning, delegation of authority and responsibility, and plans of action to protect the public, plant employees, and equipment in case of unusual incidents. These plans 3

will be for use at the local level for the control of general emergencies such as fire, personnel injury, tornadoes and high winds, and incidents that could result in the release of significant amounts of radioactivity.

The Watts Bar Nuclear Plant Radiological Emergency Plan (REP) will contain the overall TVA REP, the Nuclear Emergency Medical Assistance Plan as Annex I, and the Watts Bar Nuclear Plant Annex as Annex IV. The Watts Bar annex will contain four documents. They are the (a) Division of Power Production REP (b) Site REP (c) Environs Emergency Plan (EEP), and (d) State of Tennessee REP.

These various plans will be broken down into six documents to facilitate their use when required.

1. The TVA REP is designed to handle all radiological emergencies which might occur within TVA. During a nuclear emergency at a plant site, the Central Emergency Control Center (CECC) staff will function to provide assistance as necessary to the site and division emergency organizations and will provide all information requested by outside agencies.

2. Annex I to the TVA REP is the Nuclear Emergency Medical Assistance Plan. This plan will outline all arrangements which have been made for medical services which may be required for Watts Bar employees or others affected by the emergency.

3. Annex IV is to contain the four documents discussed above.

   a. The Division of Power Production (DPP) REP will require automatic staff actions to provide required assistance for the site by alerting support facilities, concluding arrangements with civilian support facilities, and providing any support requested by the plant.

      The major assistance provided by the division emergency staff will be to the plant itself although the staff may also provide

personnel services as required by state and local agencies. The division emergency staff also coordinate the efforts of other divisions within TVA.

b. The Site REP will deal strictly with control of the emergency within the site boundaries.

c. The Environs Emergency Plan (EEP) will deal with the emergency from the site boundary out to ten miles.

d. The State of Tennessee REP will provide the support of state organizations in the event of a nuclear emergency and is principally concerned with the well-being of area citizens. This plan will work hand-in-hand with the Watts Bar EEP.

Emergency Organization

The normal shift operating crew will provide the nucleus of the site emergency organization. The shift crew will have an adequate number of personnel with the authority to take required immediate action in any emergency. The plant emergency organization is to be headed by an emergency director. The shift engineer is responsible for declaring an emergency and acting as emergency director until relieved by the plant superintendent or a designated alternate from the plant staff. After relief, the shift engineer will remain in charge of detailed inplant operations. The shift organization is to be supplemented by predesignated individuals from the remainder of the plant staff after notification by telephone or messenger. The site emergency organization will have preassigned duties and responsibilities and will be trained to perform all actions that may be necessary to cope with the emergency and to implement the emergency plan. 3

In the event of an emergency involving the possibility of danger to the public or the offsite environment, the site emergency director will notify TVA's load coordinator who notifies the Central Emergency Control Center (CECC) Director. The CECC organization consists of TVA management personnel

from various TVA divisions and offices and is located in Chattanooga. The CECC has the authority to make arrangements and expend funds as necessary to protect the environment from the adverse effects of an emergency. They coordinate TVA offsite activities and work with various other governmental emergency groups. The members of the CECC staff are predesignated, are aware of their responsibilities, and conduct periodic drills to maintain a high degree of readiness.

The Division of Power Production emergency organization will also be notified by the site emergency director through the TVA load coordinator and provide additional manpower as required to augment the site organization. The personnel may come from other TVA nuclear plants, the Division of Power Production central office, or the Division of Power Production Service Shops Section, depending on the nature of the emergency and the disciplines required. The DPP emergency organization will also provide technical support groups for emergency planning and recovery operations.

As required an Environs Emergency team is to be dispatched to the vicinity of the emergency to conduct TVA's offsite monitoring activities and to work with monitoring groups from other agencies.

Communication networks will be adequate to handle predicted emergencies. These communications facilities include:

3

Sirens in strategic plant locations for signaling a radiological emergency.

Private automatic telephone exchange (PAX) including:

1. Code call for key employees.
2. Fire alarm.
3. Executive right-of-way.
4. Microwave connections to TVA-wide direct-dial system.

Manual telephone switchboard at the electrical control desk which includes:

1. Trunks to powerline carrier.
2. Executive right of way.
3. Trunk to PAX.
4. Fire alarm trunk.
5. Trunk to shift engineer's and plant superintendent's office.

Bell system telephone service.

Sound-powered telephone system.

Paging and intercom system.

Radio equipment including a base station, vehicle mounted radios, portable radios, and radios located at environmental sampling stations.

Coordination with Offsite Groups

TVA will have agreements with other Federal agencies through the Interagency Radiation Assistance Plan to assist in the evaluation of the emergency and control of the hazard. These agencies include AEC's Oak Ridge Operations Office and the Department of Public Health. These organizations will be notified of the emergency by the CECC staff. The regional office of AEC's Division of Compliance will also be notified.

Agreements will be made with various Tennessee Agencies to provide planning for emergencies at TVA nuclear facilities. This planning includes evacuation arrangements, traffic control, and support from civil defense agencies. These organizations will normally be notified of the emergency by the CECC staff. 3

TVA will maintain liaison with various agencies of county and municipal governments, particularly with respect to the availability of emergency services.

Arrangements will be made with a local private ambulance service to provide emergency service as required to the plant and affected areas in the event that more than the one ambulance is required. Agreements will also be culminated between TVA and a local hospital to provide emergency treatment

to irradiated or contaminated patients as required. TVA is assisting in training ambulance attendants and hospital personnel in this type of treatment and will ensure that adequate equipment is made available. Agreement has been made with the Oak Ridge Associated Universities Hospital for emergency treatment of severely contaminated or irradiated personnel.

Protective Action Levels

Protective action levels will be established depending on the nature of the emergency and the value of continuously monitored variables. These protective action levels will include those which may affect only a local area of the plant or a small number of employees as well as those which could possibly involve the public in unrestricted areas. The protective action levels will be based on the control room indications of continuously monitored variables such that the operator should quickly determine the nature of the emergency. Local emergencies may also be detected by the shift crew during routine plant tours and inspections.

Protective Measures

For each protective action level, definite protective measures or actions will be specified in the emergency plan. Such actions will include mustering personnel in preassigned assembly areas, informing personnel of the nature of the emergency, confirming the indication of the emergency, notifying the CECC director, mustering the plant emergency organization in the emergency control center, conducting radiation surveys, locating missing personnel, evacuation of nonessential personnel from the site, accounting for any visitors, and limiting access to the plant areas. Personnel safety is to be the prime consideration in all protective measures. Protective measures will become more detailed and extensive with the increasing protective action levels. The emergency plan will contain site drawings designating assembly areas and evacuation routes. 3

Protective measures, including evacuation, for offsite personnel are expected to be required only after evaluation of plant conditions and effluent release rates. However, immediate protective measures will be specified based on previously determined dose rates, population distributions, wind

conditions, and plant conditions that could cause site boundary conditions requiring action. These protective measures will include preplanned evacuation routes and reassembly points, traffic control, and public announcements.

Review and Updating

The Plant Operations Review Committee will periodically review and update the Watts Bar Nuclear Plant Emergency Plans. Changes to the basic plans will be reviewed and approved by the Safety Review Board. All holders of these plans will acknowledge, in writing, receipt of changes to the manual.

Medical Support

The emergency plan will include a description of the medical facilities at the plant and the arrangements made with other facilities to provide additional support. The plant medical facilities will include a treatment area consisting of an emergency room, treatment room, bedroom, physiotherapy room, and waiting room. A full-time nurse will be on duty during the day shift. A complete stock of medical supplies and first aid equipment is to be available. One ambulance is maintained at the site. Medical consultation is available from TVA doctors in Chattanooga and other areas. Members of the plant emergency team will be trained in first aid. 3

Arrangements will be made with a local hospital and with attending physicians for the emergency treatment of contaminated, injured, and exposed individuals. The Oak Ridge Associated Universities Hospital has agreed to provide treatment to severely contaminated or exposed individuals.

Arrangements will be made with a local private ambulance service to provide emergency service as required to the plant and affected areas in the event that more than one ambulance is required.

Drills

Periodic drills will be conducted by the plant staff on the Plant Emergency Plans. Personnel will assemble, be accounted for, and prepare to assume

their preassigned duties. Contact will be made with concerned persons outside the plant organization to confirm the adequacy of communication facilities.

On an annual basis, a TVA-wide drill on the Radiological Emergency Plan is to be conducted. The various emergency staff will assemble, assume their duties and get in touch with the various outside organizations, identifying the action as a drill.

Training

Each person having unescorted access to the plant will have received either intensive nuclear training which included the emergency plans action or a brief plant indoctrination and health physics course which includes pertinent sections of the emergency plan. Specific training will be conducted for individuals assigned to the plant emergency organization. This will include first aid training, radiological hygiene training, decontamination, and training in the emergency procedures.

TVA will assist in providing training in decontamination and treatment of contaminated patients to the staff of the local hospital and the commercial ambulance service. 3

Recovery and Reentry

The emergency plans will provide for the development and implementation of detailed recovery and reentry will be a deliberate, thoroughly planned evolution and will be reviewed by the Plant Operations Review Committee and/or the Safety Review Board depending on the nature of the emergency.

Implementation

Operating instructions, promulgated in the plant operating manual, will be used to specify control of plant operations during normal operations. Abnormal operating instructions and emergency operating instructions will be are used to specify the manipulation of controls of the plant during conditions requiring protective measures to be taken to place the plant in

a safe condition. The abnormal and emergency instructions will contain assignments of responsibility for the performance of specific tasks not otherwise established by plant practices and instructions.

Plant instrumentation indications requiring implementation of emergency and abnormal operating instructions will be specified in these instructions. Protective action levels, also based on plant instrumentation indication, requiring implementation of the radiological emergency plan for protection of personnel and the environment will be specified in the emergency plan.

Specific actions required of offsite support groups are delineated in the TVA REP and in the Division of Power Production REP.

Instructions for medical treatment and handling of contaminated and exposed individuals will be contained in the site radiological emergency plan and the TVA Nuclear Emergency Medical Assistance Plan.

Equipment requirements, including communications equipment, for implementation of the plant emergency plans will be contained in these plans. Storage and calibration requirements are also specified. 3

Alarm signals to be described in the respective emergency plans.

Instructions for restoring the emergency situation to normal, from the standpoint of the hazard to personnel, plant safety, and the environment will be contained in the emergency plans and the emergency and abnormal operating instructions. Instructions for repair of plant equipment or structures will be prepared after evaluation of the damage or malfunction involved.

12.4.6 Radiological Hygiene Manual

This manual will provide guidance for the protection of employees and the public from nuclear radiation and contamination. The manual incorporates the latest recommendations of the Federal Radiation Council. For those phases of the program where FRC recommendations have not been released, the pertinent rules and regulations set forth in 10 CFR 20 will be followed.

12.4.7 Surveillance Procedures

These procedures will cover periodic tests and inspections required by the technical specifications to assure proper operations, and to prove the adequacy and availability of critical systems and equipment. Formalized schedules and check sheets will be used to ascertain that all critical equipment and safeguards systems will satisfy their design intent.

Test schedules and records will be maintained so as to provide an orderly test and surveillance program.

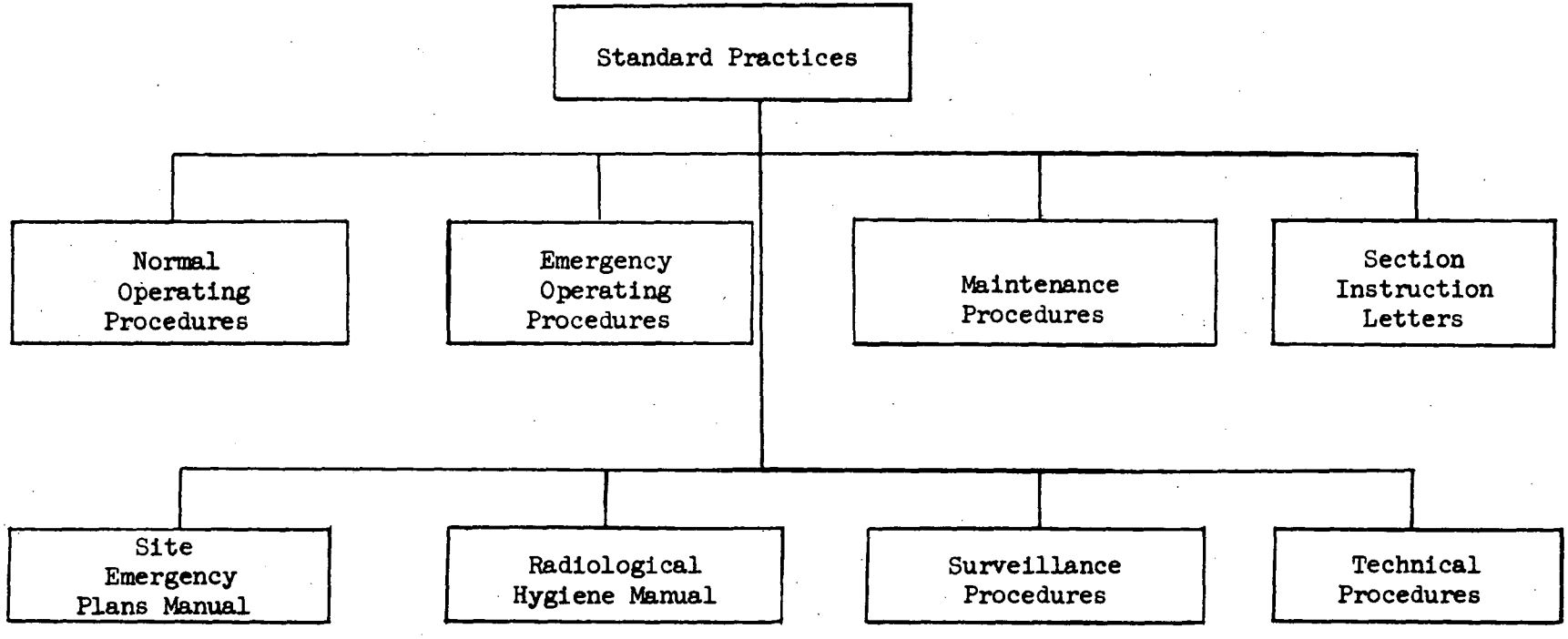
12.4.8 Technical Procedures

Procedures concerning analytical techniques and calculations will be prepared as required. Examples are, chemical control procedures which provide plant personnel with instruction on the types and frequency of chemical and radiochemical analysis, and the steps to be taken to maintain conditions within established limits.

Fuel Accountability Procedures delineating the requirements, responsibilities, and methods of nuclear material control from the time new fuel is received until it is shipped from the plant as spent fuel are contained within the technical procedures. They provide detailed steps for physical safeguards, inventory, accounting, and for preparing reports to the Atomic Energy Commission. 3

12.4.9 Section Instruction Letters

Each section supervisor will, as the need arises, prepare numbered instruction letters pertaining to administration routines, responsibilities, and methods of procedures to be followed by members of this section.



PLANT PROCEDURES

Figure 12.4-1

12.5 RECORDS

The TVA records program observes all acts of Congress, Executive orders, and regulations of Federal agencies having jurisdiction in records administration. TVA complies with Federal Power Commission regulations concerning the preservation and disposal of records of public utilities and licensees, insofar as these regulations apply to TVA records relating to the generation, transmission, and sale of electric energy.

The plant administrative officer has responsibility for general supervision and coordination of all plant records including those required by the Atomic Energy Commission pertaining to the operation of a nuclear plant.

Records reflecting plant or equipment performance and records of tests and inspections which support compliance with the plant licenses, including records of radioactivity release to the environs, are routed to the power plant results section for review and retention. These records are originated by all plant sections.

The duty shift engineer maintains an operating log book which is a chronological record of significant plant events and conditions. The unit operators maintain similar journals containing details pertaining to the operation of their individual units. The plant operators also maintain operating data sheets which ensure their frequent observations of equipment conditions and operating values. These records are examined daily by the operations supervisor and are support documents for performance analysis.

The station computer printouts and the operators' data sheets serve as the normal source of operating data and statistics. To ensure continuity of information, provision is made for supplementary data sheets to be maintained if the computer becomes inoperative. In addition, this information is supported by installed recording instrumentation. The records are also sent to the power plant results section on a regular basis for review and retention.

Each of the maintenance sections will maintain equipment history records describing repairs affected, derangements occurring, alterations made, tests conducted, and such items as are considered necessary to provide a comprehensive material history of the item concerned.

The Radiological Hygiene Group maintains records of individual radiation exposure and environmental radioactivity surveillance.

12.6 OPERATIONAL REVIEW AND AUDITS

12.6.1 Inplant Reviews

A continuing review of operations will be performed by the station operating staff. The Plant Operations Review Committee, composed of plant employees, will also review operations and serve in an advisory capacity to the plant superintendent. The members of this committee and its duties are listed in the Operational Quality Assurance Plant (Appendix A.4).

12.6.2 Operational Quality Assurance

Operations will be carried out according to procedures which conform to the Quality Assurance Manual and the Quality Assurance Policies and Requirements as set forth in the Operational Quality Assurance Plan (Appendix A.4). The Operational Quality Assurance Program will be audited by the Nuclear Engineering Branch of the Division of Power Resource Planning.

12.6.3 The Safety Review Board

A Safety Review Board advises the Manager of Power in matters related to nuclear plant safety. This Board reviews and advises on safety matters during the design, construction and operating phases of TVA nuclear plants. The members of this board and their duties are given in the Operational Quality Assurance Plan (Appendix A.4).