

INTRODUCTION AND SUMMARY

1.1 PROJECT IDENTIFICATION

This Final Safety Analysis Report is in support of the application of the Tennessee Valley Authority (TVA), herein designated as the applicant, for facility operating licenses for a three-unit nuclear power plant located at the Browns Ferry site in Limestone County, Alabama, for initial power levels up to 3293 MWt each, under Section 104(b) of the Atomic Energy Act of 1954, as amended, and the regulations of the Atomic Energy Commission set forth in Part 50 of Title 10 of the Code of Federal Regulations (10 CFR 50). The FSAR is now maintained up-to-date and used as a complete and accurate description of the Browns Ferry Nuclear Plant as constructed and as modified since.

The facility is designated as the Browns Ferry Nuclear Plant, hereinafter referred to as the plant.

Commercial operation of each unit began on the following dates: unit one on August 1, 1974, unit two on March 1, 1975, and unit three on March 1, 1977.

Browns Ferry Nuclear Plant, Units 1, 2, and 3 were subsequently uprated by five percent from 3293 MWt to 3458 MWt. In August 2017, license amendments were issued for all three units for a core thermal power uprate from 3458 MWt to 3952 MWt.

As used throughout this document, Atomic Energy Commission (AEC) is equivalent to the Nuclear Regulatory Commission (NRC) formed under the Energy Reorganization Act of 1974.

1.1.1 Identification and Qualification of Contractors

Irrespective of any contractual responsibilities with any suppliers, the Tennessee Valley Authority is the sole applicant for the facility licenses and as owner and applicant, is responsible for the design, construction, and operation of the plant.

1.1.1.1 Applicant

The TVA power system is one of the largest in the United States. TVA is primarily a wholesaler of power, operating generating plants, and transmission facilities, but no retail distribution systems. The TVA transmission system contains over 17,000 miles of lines. TVA supplies power over an area of about 80,000 square miles in parts of seven southeastern states, containing more than 2.3 million residential, farm, commercial, and industrial customers.

TVA has pioneered in erecting large generating units. Examples are the 1,150-megawatt unit at the Paradise Steam Plant; the 1,300-megawatt units at the Cumberland Steam Plant; and the two 1,170-megawatt units at the Sequoyah Nuclear Plant; and two 1,170-megawatt units at the Watts Bar Nuclear Plant. A total of over 67 individual steam generating units have been designed, constructed, and placed in operation by TVA in the past 35 years.

Much of TVA's experience has been gained from early and continuing participation in nuclear power studies. In 1946, TVA participated in the Daniels power pile study at Oak Ridge and the work of the Parker Committee, which surveyed prospects of nuclear power application. In 1953, TVA started developing a nuclear power staff and began a more detailed study of possible uses of nuclear power on its own system. In 1960, TVA agreed to operate the Experimental Gas-Cooled Reactor for AEC at Oak Ridge, and developed a technical and operating staff. Many of these trained and experienced people were assigned to TVA engineering and operating organizations that have been or are directly involved in the planning, design, construction, and operation of the Browns Ferry Nuclear Plant.

1.1.1.2 Engineer-Constructor

TVA acts as its own engineer-constructor.

Since 1949, TVA has designed and constructed a number of projects including twelve major coal-fired steam plants, consisting of 63 individual generating units.

TVA has an experienced, competent nuclear plant design organization, including a large number of engineers with many years of steam plant experience. TVA also has a similarly experienced construction organization which has had extensive experience in the construction of large steam plants. A comprehensive quality assurance program has been developed to assure that the plant has been designed and constructed and will be operated to adequate standards of quality.

1.1.1.3 Nuclear Steam Supply System Supplier

General Electric Company was awarded a contract to design, fabricate, and deliver the nuclear steam supply system and nuclear fuel for the plant, as well as to provide technical direction for installation and startup of this equipment. General Electric (GE) has been engaged in the development, design, construction, and operation of boiling water reactors since 1955. Operating boiling water reactors designed and built by General Electric include the Vallecitos Boiling Water Reactor, Dresden Unit 1, Humboldt Bay, Big Rock Point, KRB (Germany), KAHL (Germany), JPDR (Japan), SENN (Italy), Oyster Creek Unit 1, and Dresden Unit 2. Among the domestic reactors of General Electric design are Millstone Point Unit 1, Dresden Unit 3, Quad-Cities Units 1 and 2, Monticello Unit 1, Vermont Yankee Unit 1, Peach Bottom Units 2 and 3, Pilgrim, Hatch Units 1 and 2, Brunswick Units 1 and 2,

Cooper, Duane Arnold, and Fitzpatrick. Thus, General Electric has substantial experience, knowledge, and capability to design, manufacture, and furnish technical assistance for the installation, startup, and support of the normal operation of the reactor.

1.1.1.4 Turbine-Generator Supplier

The applicant awarded a contract to General Electric to design, fabricate, and deliver the turbine generators for the plant as well as to provide technical assistance for installation and startup of this equipment. General Electric has a long history in the application of turbine generators in nuclear power stations going back to the inception of nuclear facilities for the production of electrical power and has furnished the turbine-generator units for most of its BWR nuclear steam supply contracted stations. General Electric was competent to design, fabricate and deliver the turbine-generator units and to provide technical assistance for the installation and startup of this equipment.

1.1.2 Licensing Basis Documents

The following documents are typical documents submitted periodically to NRC. Implementation of changes to these documents without NRC approval may be controlled by regulation or the plant license. The following list provides references for the review and approval requirements for the listed documents.

<u>Document</u>	<u>Regulation Or Requirement</u>
Updated Final Safety Analysis Report (UFSAR)	10 CFR 50.71(e)
Technical Requirements Manual and Tech. Spec. Bases	10 CFR 50.59
Organizational Topical Report	10 CFR 50.54(a)(3)
Quality Assurance Plan	10 CFR 50.54(a)(3)
Offsite Dose Calculation Manual (ODCM)	Tech. Spec., Section 5.5.1
Physical Security Plan	10 CFR 50.54(p)
Radiological Emergency Plan (REP)	10 CFR 50.54(q)
Core Operating Limits Report (COLR)	Tech. Spec., Section 5.6.5