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1.0 INTRODUCTION AND GENERAL DESCRIPTION OF PLANT

1.1 INTRODUCTION

1.1.1 General Information

The Updated Final Safety Analysis Report (UFSAR) is submitted as a unique document in compliance with Regulatory Guide (RG) 1.70, "Standard Format and Content of Safety Analysis Reports," Rev. 2 and 10CFR50.71(e).

The original Final Safety Analysis Report (FSAR) was submitted in support of the application by Houston Lighting & Power Company (HL&P) for a Class 103 construction permit and facility operating license for the nuclear power plants designated as South Texas Project Electric Generating Station (STPEGS) Units 1 and 2.

The applicant was HL&P acting for itself and for City Public Service Board of San Antonio, Texas (CPS), Central Power and Light Company (CPL), and the city of Austin, Texas (COA) pursuant to the South Texas Project Participation Agreement between said four systems. HL&P, acting as project manager for the owners, was responsible for the design, construction, and operation of the STPEGS Units 1 and 2.

HL&P was responsible for securing a Class 103 construction permit and the operating licenses for the two units. The license was applied for under Section 103 of the Atomic Energy Act of 1954 as amended and the regulations of the U.S. Nuclear Regulatory Commission (NRC) as set forth in Title 10 of the Code of Federal Regulation (CFR). HL&P was involved in a limited amount of the design for the two units, reviewed the entire design, and initially had overall responsibility for STPEGS.

On November 17, 1997 responsibility for the operation of the South Texas Project was transferred from HL&P to the STP Nuclear Operating Company (STPNOC). STPNOC is a Texas non-profit corporation created, controlled and financed by the Owners specifically for the purpose of operating STPEGS. This change was incorporated in the Unit 1 and Unit 2 Licenses via Amendments 93 and 80, respectively.

On August 31, 2002, HL&P (Reliant Energy) transferred its ownership interest in STPEGS and in STPNOC to Texas Genco, LP. This change was incorporated in the Unit 1 and Unit 2 Operating Licenses via Amendments 142 and 130, respectively.

On January 12, 2006, the NRC approved the transfer of ownership interest in STPEGS and in STP Nuclear Operating Company from Texas Genco, LP to NRG South Texas LP. This change was incorporated in the Unit 1 and Unit 2 Operating Licenses via Amendments 178 and 165, respectively.

On November 1, 2023, the NRC approved the transfer of ownership interest in STPEGS and in STP Nuclear Operating Company from NRG South Texas LP to Constellation Energy Generation, LLC. This change was incorporated in the Unit 1 and Unit 2 Operating Licenses via Amendments 226 and 211, respectively. CN-3378

American Electric Power Company, Inc. (AEP) is the parent company of CPL. Effective December 23, 2002, AEP sold the retail company portion of CPL to Centrica, and transferred the Central Power

and Light/CPL names to Centrica as well. AEP renamed the remaining portions of CPL (generation and distribution interests) as "AEP Texas Central Company" (TCC). TCC sold its STP ownership interest to CPS and Texas Genco, LP on May 19, 2005.

AEP Texas Central Company sold its ownership interest in STPEGS to Texas Genco, LP and CPS. License Amendments 172/160 became effective on May 19, 2005. Texas Genco, LP sold its STP ownership interest to NRG South Texas LP. License Amendments 178 and 165 became effective on June 29, 2007.

NRG South Texas LP sold its STP ownership interest to Constellation Energy Generation, LLC. License Amendments 226 and 211 became effective on November 1, 2023. CN-3378

The following entities currently own the STPEGS site, Units 1 and 2, and common station facilities: CN-3378

- Constellation Energy Generation, LLC
- City Public Service Board of San Antonio
- City of Austin

The site is located in south-central Matagorda County west of the Colorado River, 8 miles north-northwest of the town of Matagorda and about 89 miles southwest of Houston (Figure 1.2-1). The exclusion area is shown on Figure 1.1-1.

The plant is designed as essentially two duplicate units. Description of one unit shall be interpreted as applying to both units. Differences between the two units, structures, systems, and components that are shared between the two units are specified in the appropriate section in the UFSAR and are summarized in Section 1.2.

The limited work authorization was granted on August 12, 1975, and nonsafety-related construction was initiated in September 1975. A Class 103 construction permit was granted on December 22, 1975.

Fuel loading was completed in August 1987 and December 1988 for Units 1 and 2, respectively. Commercial operation was declared in August 1988 and June 1989 for Units 1 and 2, respectively.

Each unit utilizes a four-loop, pressurized water reactor (PWR) Nuclear Steam Supply System (NSSS) and supporting auxiliary systems designed by Westinghouse Electric Corporation.

The rated core thermal power of each unit is 3,853 MWt. Each unit was originally designed for a net electrical power output of 1,250 MWe at 3.5 in. Hg abs. backpressure.

Brown & Root, Inc. (B&R) was the initial engineer/constructor responsible for the design, engineering, equipment and material procurement, and construction of STPEGS Units 1 and 2. This included all plant structures, systems, and components other than those provided by the NSSS supplier, except for any promotional or other non-plant-oriented structures that were done by outside contractors.

In September 1981, Bechtel Energy Corporation (BEC), at the request of HL&P, initiated action to assume responsibility for engineering, design, procurement, and construction management of STPEGS. Ebasco Services, Inc. was responsible for construction of STPEGS.

The Containment structure is a post-tensioned concrete cylinder with steel liner plates, hemispherical top, and flat bottom. The cylinder portion and the hemispherical dome of the Containment are prestressed by a Post-Tensioning System consisting of horizontal and vertical tendons. Three buttresses are equally spaced around the Containment. The cylinder and the lower half of the dome are prestressed by horizontal tendons anchored 360 degrees apart by passing the intermediate buttresses. Each successive hoop is progressively offset 120 degrees from the one beneath it. The vertical U-shaped tendons are continuous over the dome, forming a two-way Post-Tensioning System for the dome. These tendons are anchored in a continuous gallery beneath the base slab which is provided for the installation and inspection of the vertical tendons.

1.1.2 Organization of Contents

This UFSAR has been organized according to the guidelines established by the regulatory staff of the NRC in their publication, "Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants" (Rev. 2, dated September 1975), and the regulations of the NRC set forth in 10CFR50.

Portions of this UFSAR may have to be clarified or revised during the course of operation and these changes will be made in the form of revisions. The revision process will contain the following procedures:

1. When a change is made to the UFSAR text, those pages affected will be marked with the revision number in the lower right-hand corner and a vertical line in the right-hand margin next to the material affected.

2. Figures will be revised by indicating the revision umber in the lower right-hand corner of the page.

Lists of acronyms, abbreviations, and names of major buildings and structures used throughout this UFSAR are given in Tables 1.1-1, 1.1-2, and 1.1-3, respectively. Figures 1.1-2 and 1.1-3 provide piping and instrumentation symbols used on engineering drawings throughout the UFSAR.

1.1.3 Licensing Basis and Configuration Control of the UFSAR

STP controls the UFSAR in compliance with the requirements of 10CFR50.71 (e). The UFSAR is regarded as the primary document describing the licensing basis of the station, although the comprehensive definition of the Current Licensing Basis may include other documents as described in station procedures.

1.1.3.1 Non-Licensing Basis Information in the UFSAR - Information contained in the UFSAR that meets the criteria listed below is not regarded as constituting current licensing bases requirements and is maintained in the UFSAR only for historical or informational purposes.

1. Historical information in Table 7.1-2, which was included on a one-time basis to provide general perspective of the facility or to provide a comparison with other facilities.

2. General arrangement drawings are listed in Table 1.2-1. As noted in R.G. 1.70, the general arrangements are included "to provide a reasonable understanding of the general layout of the plant."

1.1.3.2 Changes to Electrical, Instrumentation, and Controlled Drawings – electrical, instrumentation and controlled drawings listed in Tables 1.7-1, 1.7.2 and 1.7-3 of the UFSAR; and controlled drawings relocated to the STP Controlled Drawing Manual (P&IDs, single line diagrams, logic diagrams, etc.) are provided to aid in understanding the design, function and method of performing the function of a component, system or structure described in the text of the UFSAR. These drawings provide detailed information for the purpose of plant configuration control documentation. As a result, more detail exists in these drawings than is necessary to support the safety analysis in the UFSAR. Therefore, changes to the electrical, instrumentation and controlled drawings listed in Tables 1.7-1, 1.7-2 and 1.7-3 of the UFSAR; and controlled drawings relocated to the STP Controlled drawing Manual that meet criteria 1, 2, and 3 AND at least one of criteria 4, 5, and 6 below have been generically reviewed pursuant to 10CFR50.59 and are not considered changes to the UFSAR.

1. The change does not:

   - Affect the reactor coolant system pressure boundary.
   - Affect the function of the systems, structures or components required to achieve or maintain safe shutdown.
   - Affect the function of the systems, structures or components required to mitigate the consequences of an accident, including fire.
   - Affect the function of the systems, structures or components described in the safety analysis report for regulatory compliance (e.g., AMSAC).

2. The change does not affect calculational results used to support the conclusions in the safety analysis report.

3. The changes meets design specifications. Design specifications are the criteria or range of criteria for controlling parameters for assurance that design safety functions are met.

4. The change is made to systems, structures, or components that are part of the current plant configuration but which are not described or referred to in the text of the UFSAR. Failure of these systems, structures or components are evaluated to not have any direct or indirect effect on the design, function of method of performing the function of systems, structures or components as described in the safety analysis report.

5. The change involves additions or deletions of systems, structures or components to the plant's configuration that does not alter the design, function or method of performing the function as described in the text of the UFSAR.

6. The change involves reference information on the engineering document (s) that does not require or result in a corresponding physical change to the existing configuration of the system, structure or component, nor is found in or referred to in the text of the safety analysis report.

TABLE 1.1-1

ACRONYMS USED IN THE UFSAR

AA	air-to-air
AAB	Accident Analysis Branch
AACC	American Association for Contamination Control
AB	auxiliary boiler
ABMA	American Boiler Manufacturers′ Association
ACGIH	American Conference of Government and Industrial Hygienists
ACI	American Concrete Institute
ACNGS	Allens Creek Nuclear Generating Station
ACRS	Advisory Committee on Reactor Safeguards
ACWS	Auxiliary Cooling Water System
AD	Auxiliary Demineralizer
A/E	architect/engineer
AEC	Atomic Energy Commission
AF	alternating field
AFBMA	Anti-Friction Bearing Manufacturer Association
AFFF	aqueous film-forming foam
AFI	Air Filter Institute
AFOST	auxiliary fuel oil storage tank
AFST	auxiliary feedwater storage tank
AFW	auxiliary feedwater
AFWS	Auxiliary feedwater System
AGMA	American Gear Manufacturers Association
AGU	American Geophysical Union
AHU	air handling unit
AI	authorized inspector
AIA	authorized inspection agency
AISC	American Institute of Steel Construction
ALARA	as low as is reasonably achievable
ALP	Actuation Logic Processor (AMSAC)

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

ALS	Actuation Logic System (AMSAC)
AMCA	Air Moving & Conditioning Association
AMSAC	ATWS Mitigation System Actuation Circuitry
ANI	American Nuclear Insurers
ANS	American Nuclear Society
AOO	anticipated operational occurrence
ANSI	American National Standards Institute
AOV	air-operated valve
APC	auxiliary process cabinets
APCSB	Auxiliary and Power Conversion Systems Branch
API	American Petroleum Institute
ARI	A/C and Refrigeration Institute
ARTCC	Air Route Traffic Control Center
AS	auxiliary steam
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASNT	American Society of Nondestructive Testing
ASNT-TG-IA	American Society of Nondestructive Testing – Training Guide IA
ASP	auxiliary shutdown panel
ASTM	American Society for Testing and Materials
ATL	adjacent-to-line
ATWS	anticipated transients without scram
ATWT	anticipated transients without trip
AVS	American Voluntary Standard
AVT	All Volatile Treatment
AWS	American Welding Society
AWWA	American Water Works Association
B&PV	boiler and pressure vessel

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

B&R	Brown & Root, Inc.
B&W	Babcock and Wilcox
BA	boric acid
BAT	boric acid tank
BCMS	Boron Concentration Measurement System
BCWID	Brown County Water Improvement District
BEC	Bechtel Energy Corporation
BNWL	Battelle Northwest Laboratories
BOL	beginning of life
BOP	balance-of-plant
BRS	Boron Recycle System
BSAP	Bechtel Structural Analysis Program
BSF	basin shape factor
BTP	Branch Technical Position
BTRS	Boron Thermal Regeneration System
BWR	boiling water reactor
B&W	Babcock and Wilcox
CAM	constant air monitor
CAO	Chemical Auxiliary Operator
CARSDHRM	Condenser Air Removal System Discharge Header Radiation Monitor
CAS	Central Alarm Station
CASE	Coordinating Agency for Supplier Evaluation
CCP	centrifugal charging pump
CCTV	closed circuit TV
CCW	component cooling water
CCWS	Component Cooling Water System
CDC	Control Data Corporation
CES	Cooper Energy Service
CFR	Code of Federal Regulations

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

CFS	Chemical Feed System
CHRS	Containment Heat Removal System
CID	consolidated-isotropic-drained
CIS	Containment Isolation System
CIU	consolidated-isotropic-undrained
CLACWS	Closed-Loop Auxiliary Cooling Water System
CMAA	Crane Manufacturers Association of America, Incorporated
CMTR	Certified Material Test Reports
CMU	concrete masonry unit
COA	City of Austin
COMS	Cold Overpressure Mitigation System
CONOCO	Continental Oil Co. of Houston
COV	center of vortex
CP	Construction Permit
CPB	Core Performance Branch
CPDS	Condensate Polishing Demineralizer System
CPI	center pressure index
CPM	critical path method
CPRW	condensate polishing regeneration waste
CPRWCT	condensate polishing regeneration waste collection tank
CPS	City Public Service Board of San Antonio
CPU	central processing unit
CR	Control Room
CRD	Chief of Research and Development Department, U.S. Army Corps of Engineers
CRDR	Control Room Design Review
CRDS	Control Rod Drive System
CRDM	control rod drive mechanism
CRMWD	Colorado River Municipal Water District
CRS	Control Room Survey

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

CRT	cathode ray tube
CRW	Chief, Reactor Watch
CS	carbon steel
CSB	Containment Systems Branch
CSF	Critical Safety Function
CSRB	Corporate Safety Review Board
CSS	Containment Spray System
CST	condensate storage tank or Central Standard Time
CT	compact tension
CU	consolidated-undrained
CVCS	Chemical and Volume Control System
CVN	Charpy V-Notch
CWDS	Circulating Water Discharge Structure
CWIS	Circulating Water Intake Structure
CWS	Circulating Water System
DADS	Data Acquisition and Display System
DAF	dynamic amplification factor
DAS	Data Acquisition System
DAW	dry active waste
DBA	Design Basis Accident
DBE	Design Basis Earthquake
DCN	document change notice
DCSS	Dry Cask Storage System
DDR	deficiency and disposition reports
DECL	double-ended cold leg
DEHL	double-ended hot leg
DEMA	Diesel Engine Manufacturers Association
DEPS	double-ended pump suction
DEPSG	double-ended pump suction guillotine

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

DF	decontamination factor
DG	diesel generator
DGB	Diesel Generator Building
DGCAIES	Diesel Generator Combustion Air Intake and Exhaust System
DGCWS	Diesel Generator Cooling Water System
DGFOST	diesel generator fuel oil storage tank
DGFST	Diesel Generator Fuel Storage and Transfer (System)
DHI	Danish Hydraulic Institute
DLC	D.L. Carroll Constructors
DLF	dynamic load factor
DMUX	demultiplexer
DNB	departure from nucleate boiling
DNBR	departure from nucleate boiling ratio
DOP	dioctyl phthalate
DOT	Department of Transportation
DPE	discipline project engineer
DPS	Texas Department of Public Safety
DPU	data base processing unit
DRPIS	Digital Rod Position Indication System
DWR	Department of Water Resources
DWS	Demineralized Water System
DWST	demineralized water storage tank
DWT	drop weight test
EAB	Electrical Auxiliary Building
EAE	energy absorbing element
EAM	energy absorbing material
EAP	Engineering Assurance Program
EBS	Emergency Boration System
ECCS	Emergency Core Cooling System

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

ECI	Ebasco Constructors, Inc.
ECP	Essential Cooling Pond
ECT	evaporator concentrate tank
ECW	essential cooling water
ECWIS	Essential Cooling Water Intake Structure
ECWS	Essential Cooling Water System
EDF	Earthquake Data File
EFDS	Equipment and Floor Drain System
EFPD	effective full-power days
EFPY	effective full-power years
EHC	Electrohydraulic Control (System)
EHS	elastic-half-space
EICF	epoxy-impregnated cellulose fiber
EICSB	Electrical, Instrumentation, and Control Systems Branch
EMP	Emergency Management Plan
EOF	Emergency Operation Facility
EOL	end of life
EOP	Emergency Operating Procedures
EOOW	Engineer Officer of Watch
EPA	Environmental Protection Agency
EPBX	electronic private branch exchange
EPM	engineering project manager
EPR	ethylene propylene rubber
EPRI	Electric Power Research Institute
EPZ	Emergency Planning Zone
EQDP	equipment qualification data package
ER	environmental report
ERCOT	Electric Reliability Council of Texas
ERDA	Energy Research and Development Administration

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

ERF	Emergency Response Facilities
ERFDADS	Emergency Response Facilities Data Acquisition and Display System
ERG	Emergency Response Guidelines
ERS	Engine Room Supervisor
ERTS	earth resources technology satellite
ESDR	engineered safeguards design rating
ESF	Engineered Safety Feature (s)
ESFAS	Engineered Safety Features Actuation System
ESSA	Environmental Science Services Administration
ETSB	Effluent Treatment Systems Branch
EWS	Engineering Watch Supervisor
EZB	exclusion zone boundary
FA	forced air
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FCV	flow control valve
FDT	floor drain tank
FEM	finite element method
FHA	Fuel Handling Accident
FHAR	Fire Hazards Analysis Report
FHB	Fuel Handling Building
FHS	Fuel Handling System
FM	farm-to-market road
FMEA	failure modes and effects analysis
FOA	forced oil and air
FOST	fuel oil storage tank
FPC	Federal Power Commission
FPT	feed pump turbine
FR	friction ratio

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

FREA	field request for engineering action
FRG	Functional Restoration Guideline
FRS	floor response spectra
FSAR	Final Safety Analysis Report
FTS	Fuel Transfer System
FTTS	fuel transfer tube sleeve
FW	feedwater
FWIV	feedwater isolation valve
GAI	Gilbert Associates, Inc.
GDC	general design criterion
GE	General Electric
GM	Geiger Mueller
GUS	Geophysical United Services
GWMS	Gaseous Waste Management System
GWPS	Gaseous Waste Processing System
H&V	heating and ventilating
HDPE	Hi Density Polyethylene
HEC	Hydrologic Engineering Center
HEI	Heat Exchanger Institute
HELB	high energy line break
HEPA	high-efficiency particulate air filters
HF	high frequency
HFP	hot full power
HHSI	high-head safety injection
HI	Hydraulic Institute
HIC	high integrity containers
HITC	Hydraulic Institute Test Codes
HJTC	heat junction thermocouple
HL&P	Houston Lighting & Power Company

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

HLA	Harding Lawson & Associates
HMR	hydrometeorological report
HNDC	Hittman Nuclear Development Corporation
HP	high-pressure
HPCI	high-pressure coolant injection
HPOGS	Health Physics Operations General Supervisor
HSST	heavy section steel technology
H&V	heating and ventilating
HVAC	heating, ventilating, and air conditioning
HX	heat exchanger
HZP	hot zero power
I&C	instrumentation and control
ICC	inadequate core cooling
ICRP	International Commission or Radiation Protection
ID	inside diameter
IEEE	Institute of Electrical and Electronic Engineers
IES	Illumination Engineering Society
IFR	instrument flight rules
ILRT	integrated leak rate test
INPO	Institute of Nuclear Power Operations
IOTA	imagery-observed tonal anomoly
I/O	input/output
IP	instrument panel
IPCEA	Insulated Power Cable Engineers Association
ISEG	Independent Safety Engineering Group
ISFSI	Independent Spent Fuel Storage Installation
ISI	inservice inspection
IVC	Isolation Valve Cubicle
JIB	jet impingement barrier

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

JTG	Joint Test Group
LASRST	low activity spent resin storage tank
LC	Load Center
LCD	Local Climatological Data
LCRA	Lower Colorado River Authority
LCU	local control unit
LCVIP	Licensee Contractor and Vendor Inspection Program
LED	light-emitting diode
LEFM	linear elastic fracture mechanics
LFL	lower flammability limit
LGSP	liquid and gas sample panel
LHSI	low-head safety injection
LHST	laundry and hot shower tank
LICI	Lakeside Irrigation Company, Inc.
LL	liquid limit
LLD	lower limits of detection
LLRT	local leak rate test
LMCC	Lumbermen's Mutual Casualty Company
LMFW	loss of main feedwater
LMTD	log mean temperature difference
LNG	liquified natural gas
LOAC	loss of all AC power
LOCA	Loss-of-Coolant Accident
LOOP	Loss-of-Offsite Power
LOR	lower oil reservoir
LP	low-pressure
LPCI	low-pressure coolant injection
LPG	liquid petroleum gas
LPMS	Loose Parts Monitoring System

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

LPZ	low population zone
LRTS	Liquid Radwaste Treatment System
LSA	low specific activity
LTMD	less than minimum detectable (concentration)
LVDT	linear variable differential transformer
LWPS	Liquid Waste Processing System
LWR	Light Water Reactor
MAB	Mechanical Auxiliary Building
MCARS	Main Condenser Air Removal System
MCB	main control board
MCC	motor control center
MCD	mitigating core damage
MCR	Main Cooling Reservoir
MDC	moderator density coefficient
MDWS	Makeup Demineralized Water System
MEAB	Mechanical-Electrical Auxiliaries Building
MEB	Mechanical Engineering Branch
MET	meteorological system
MFIV	main feedwater isolation valves
MFWLB	main feedwater line break
MG	motor generator
MIL	military standards
MLW	mean low water
MOL	middle-of-life
MOV	motor-operated valve
MPC	maximum permissible concentration
MPC-37	Multi-Purpose Canister-37
MPCA	maximum permissible concentration in air
MRBT	multi-rod burst test

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

MRS	model response spectra
MS	main steam
MSIV	main steam isolation valve
MSL	mean sea level
MSLB	main steam line break
MSR	moisture separator reheater
MSS	Manufacturers Standardization Society
MTC	moderator temperature coefficient
MTE	measuring and test equipment
MTEB	Materials Engineering Branch
MUX	multiplexer
MWR	maintenance work request
NA	not applicable
NASA	National Aeronautics and Space Administration
NCC	National Climatic Center
NCR	Nonconformance Report
NDE	nondestructive examination
NDT	nil-ductility transition or nondestructive testing
NDTT	nil-ductility transition temperature
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NEPIA	Nuclear Engineering Property Insurance Association
NFPA	National Fire Protection Association
NGS	National Geodetic Survey
NIOSH	National Institute of Occupational Safety and Health
NIS	Nuclear Instrumentation System
NIST	National Institute of Standards and Technology
NM	nautical miles
NNS	non-nuclear safety

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

NOAA	National Oceanic and Atmospheric Association
NPEC	Nuclear Power Engineering Committee
NPOD	Nuclear Plant Operations Department
NPSH	net positive suction head
NPSI	Nuclear Power Services, Inc.
NRC	Nuclear Regulatory Commission
NRM	natural remanent magnetization
NSC	Nuclear Services Corporation
NSF	National Sanitation Foundation
NSSS	Nuclear Steam Supply System
NTD	Nuclear Training Department
NTOL	near-term operating license
NUS	NUS Corporation
NWS	National Weather Service
OA	oil-to-air
OBE	Operating Basis Earthquake
OCD	Office of Civil Defense
OCR	overconsolidation ratio
OD	outside diameter
OER	Operating Experience Review
OIM	Operating Interface Modules
OL	Operating License
ONAF	Oil Natural Air Forced
ONAN	Oil Natural Air Natural
OQAP	Operations Quality Assurance Plan
ORE	occupational radiation exposure
ORG	Optimal Recovery Guidelines
ORNL	Oak Ridge National Laboratory
OSC	Operational Support Center

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

OSF	On Site Staging Facility
OSGSF	Old Steam Generator Storage Facility
OSHA	Occupational Safety and Health Administration
OS&Y	outside screw and yoke
P	probability
PA	postulated accident
PABX	private automatic branch exchange
PAMS	Post-Accident Monitoring System
PAP	plant administrative procedure
PASS	Post-Accident Sampling System
PBX	private branch exchange
PCI	Prestress Concrete Institute
PCM	Pulse Code Multiplexing
PCS	Process Control System
PCT	Peak Clad Temperature
PERMS	Process and Effluent Radiation Monitoring System
PGDS	Pressurized Gas Distribution System
PI	plasticity index
P&ID	piping and instrument diagram
PL	plastic limit
PLC	Programmable Logic Controller
PL&G	Pickard, Lowe, and Garrett
PM	photomultiplier
PMD	packless metal diaphragm
PMF	probable maximum flood
PMH	probable maximum hurricane
PMP	probable maximum precipitation
PMS	project management and scheduling
PMW	probable maximum wind

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

POQAP	plant operational quality assurance procedure
PORC	Plant Operations Review Committee
PORV	power-operated relief valves
PPC	pore pressure cell
PPRS	Pressurizer Pressure Relief System
PPWS	Propulsion Plant Watch Supervisor
PRSR	Passive response spectrum recorder
PRT	pressurizer relief tank
PS	pressurizer surge
PSAR	Preliminary Safety Analysis Report
PSARV	pressurizer safety and relief valves
PSES	Penetration Space Exhaust subsystem
PSI	Preservice inspection
PSMS	Plant Safety Monitoring System
PSS	Process Sampling System
PSWS	Potable and Sanitary Water System
PTS	Pressurized Thermal Shock
PVC	polyvinyl chloride
PWHT	post weld heat treated
PWR	pressurized water reactor
QA	quality assurance
QAB	Quality Assurance Branch
QAMRB	Quality Assurance Management Review Board
QA/QC	quality assurance/quality control
QAP	quality assurance procedures
QC	quality control
QCP	quality control procedures
QDPS	Qualified Display Processing System
QTD	quadrant tilt difference

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

RC	Reactor Containment or reactor coolant
RCA	Radiologically Controlled Area
RCB	Reactor Containment Building
RCC	rod cluster control
RCCA	rod cluster control assembly
RCCAE	rod cluster control assembly ejection
RCDT	reactor coolant drain tank
RCFC	Reactor Containment fan cooler
RCFS	Reactor Coolant Filtration System
RCL	reactor coolant loop
RCP	reactor coolant pump
RCPB	reactor coolant pressure boundary
RCPCS	Reactor Coolant Purity Control Subsystem
RCS	Reactor Coolant System
RCU	remote control unit
RCVDS	Reactor Coolant System Vacuum Degassing System
RDT	Reactor Development Technology (Division of the NRC)
REMP	Radiological Environmental Monitoring Program
RFT	Release for Test
RG	Regulatory Guide
RH	relative humidity
RHR	Residual Heat Removal
RHRS	Residual Heat Removal System
RHT	recycle holdup tank
RIM	required input motion
RLRS	Relocated Little Robbins Slough
RLS	Radiological Laboratory Supervisor
RMC	Radioactive Material Control
RMCS	Reactor Makeup Control System

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

RMPF	reservoir make-up pumping facility
RMS	Radiation Monitoring System
RMW	Reactor Makeup Water
RMWS	Reactor Makeup Water System
RMWST	reactor makeup water storage tank
RO	reactor operator
RPCR	Radiation Protection Counting Room
RPGS	Radiological Protection General Supervisor
RPO	Plant Operator
RPS	Reactor Protection System/also used as Radiation Protection Supervisor
RPT	radiation protection technician
RPU	remote processing unit
RPV	reactor pressure vessel
RR	relay room
RRRV	rate of rise of recovery voltage
RRS	required response spectrum
RSB	Reactor Systems Branch
RSM	Radiological Services Manager
RT	reference temperature
RTD	resistance temperature detector
RTP	rated thermal power
RTS	Reactor Trip System
RTT	reference transition temperature
RVHVS	Reactor Vessel Head Vent System
RVWLS	Reactor Vessel Water Level System
RWCUS	reactor water cleanup system
RWP	radiation work permit
RWST	refueling water storage tank
SAB	Site Analysis Branch

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

SAF	Semi-analytical formula
SAMA	Scientific Apparatus Manufacturers Association
SAR	Safety Analysis Report
SBDG	Standby Diesel Generator
SBFOST	Standby fuel oil storage tank
SBM	Structural benchmark
SC	safety class
SCBA	self contained breathing apparatus
SCR	silicon control rectifier
SCS	Soil Conservation Service
SDD	system design description
SDF	spillway design flood
SDR	supplier deviation request
SEB	Structural Engineering Branch
SER	Safety Evaluation Report
SFA	spent fuel assembly
SFP	spent fuel pool
SFPCCS	Spent Fuel Pool Cooling and Cleanup System
SFPE	spent fuel pool exhaust
SFTA	System Function and Task Analysis
SG	steam generator
SGBS	Steam Generator Blowdown System
SGFP	steam generator feed pump
SGFPT	steam generator feed pump turbine
SGTR	steam generator tube rupture
SGWLCS	steam generator water level compensation system
SI	safety injection
SIAS	safety injection actuation signal

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

SIS	Safety Injection System
SIT	structural integrity test
SLAR	side-looking airborne radar
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SMT	Secondary Makeup Tank
SOV	solenoid-operated valve
SP	self-potential curve
SPDS	Safety Parameter Display System
SPF	standard project flood
SPP	southwest power pool
SPS	standard project storm
SPT	standard penetration test
SQRT	Seismic Qualification Review Team
SRBT	single rod burst test
SRO	senior reactor operator
SRP	Standard Review Plan
SRSS	square root of the sum of the squares
SRST	spent resin storage tank
SS	stainless steel
SSD	Safe Shutdown
SSE	Safe Shutdown Earthquake
SSI	soil/structure interaction
SSPC	Steel Structure Painting Council
SSPS	Solid-State Protection System
SSS	Secondary Sampling System
STA	Shift Technical Advisor
STIS	South Texas Interconnected System
STPEGS	South Texas Project Electric Generating Station
STPNOC	South Texas Project Nuclear Operating Company

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

SWPS	Solid Waste Processing System
SWST	service water storage tank
TAMU	Texas A&M University
TAS	Temperature Averaging Scheme (RCS LOOP T_{hot})
TBEG	Texas Bureau of Economic Geology
TBS	Turbine Bypass System
TC	thermocouple
TCC	AEP Texas Central Company
TCV	temperature control valve
TDC	thermal diffusion coefficient
TDDU	time delay drop unit
TDH	total developed head
TDS	total dissolved solids
TDM	Time Division Mutiplexers
TDWR	Texas Department of Water Resources
TEMA	Tubular (Exchanger) Manufacturer's Association
TESC	Texas Electric Service Company
TG	turbine generator
TGAS	Tendon Gallery Access Shaftover
TGB	Turbine Generator Building
TIS	Texas Interconnected System
TLD	thermoluminescent dosimeter
TLLRWDA	Texas Low-Level Radioactive Waste Disposal Authority
TLV	threshold limit valve
TMI	Three Mile Island
T/MS	Test/Maintenance System (AMSAC)
TNRCC	Texas Natural Resource Conservation Commission
TRS	test response spectrum
Tsat	saturation temperature

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

TSC	Technical Support Center
TSHD	Texas State Highway Department
TSI	Thermal Science Inc.
TSP	Trisodium Phosphate
TVA	Tennessee Valley Authority
TWC	Texas Water Commission
TWDB	Texas Water Development Board
TWQB	Texas Water Quality Board
TWRC	Texas Water Rights Commission
UBC	Uniform Building Code
UFL	upper flammability limit
UFSAR	Updated Final Safety Analysis Report
UHF	ultra high frequency
UHS	ultimate heat sink
UL	Underwriters' Laboratories
UOR	upper oil reservoir
UPS	uninterruptable power supply
USAEC	U.S. Atomic Energy Commission
USACE	U.S. Army Corp of Engineers
USASI	U.S. American Standards Institution
USBR	U.S. Bureau of Reclamation
USCGS	U.S. Coast and Geodetic Survey
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USNRC	U. S. Nuclear Regulatory Commission
USPHS	U. S. Public Health Service
UTM	universal transverse mercator
UU	unconsolidated-undrained
VCT	volume control tank

TABLE 1.1-1 (Continued)

ACRONYMS USED IN THE UFSAR

VFR	visual flight rules
VHF	very high frequency
VSLO	valve stem leak-off
VWO	valve wide open
WCAP	Westinghouse Commercial Atomic Power
WCC	Woodward-Clyde Consultants
WCU	Waste Collection Unit
WEC	waste evaporator condensate
WECD	waste evaporator condensate demineralizer
WECT	waste evaporator condensate tank
WGSF	Waste Gas System Failure
WHT	waste holdup tank
WHTPD	waste holdup tank purification demineralizer
WMT	waste monitoring tank
WNES	Westinghouse Nuclear Energy System
WOG	Westinghouse Owners Group
WPS	Waste Processing System
Westinghouse	Westinghouse Electric Corporation
ZPA	zero period acceleration

TABLE 1.1-2

ABBREVIATIONS USED IN THE UFSAR

Words or Term	Abbreviation
alternating current	AC
ampere	a
ampere-hour	Ah
angstrom	A
angular velocity	l
atmosphere	atm
atomic mass unit	amu
atomic percent	a/o
average	avg
billion cubic feet	Mmcf
brake horsepower	bhp
British thermal unit	Btu
calorie	cal
centigram	cg
centimeter	cm
conductance	mho
counts per minute	counts/min
cubic centimeter	cm^3
cubic foot	ft^3
cubic feet per hour	ft^3/hr
cubic feet per minute	ft^3/min
cubic feet per second	ft^3/sec
cubic feet per second-days	ft^3/sec-days
cubic inch	$in.^3$
cubic kilometer	km^3
cubic meter	m^3
cubic mile	mi^3
curie	Ci
cycles per second	Hz
decibel	dB
degrees Baume′	°B
degrees Centigrade	°C
degrees Fahrenheit	°F
degrees Kelvin	°K
direct current	DC
disintegrations per minute	dpm
dry bulb	db
electromagnetic unit	emu
electron volt	eV

TABLE 1.1-2 (Continued)

ABBREVIATIONS USED IN THE UFSAR

Words or Term	Abbreviation
exponent	E
feet (foot)	ft
feet per minute	ft/min
feet per second	ft/sec
fluence, neutron	nvt
flux, neutron	nv
foot candle	ft-cdl
foot-pound	ft-lb
gallon	gal
gallons per day	gal/day
gallons per hour	gal/hr
gallons per minute	gal/min
gallons per second	gal/sec
giga volt ampere	gva
gram	g
height	ht
Hertz	Hz
high voltage	Hv
horsepower	hp
horsepower-hour	hp-hr
hour	hr
inch (inches)	in.
inch-pound	in.-lb
inches per second	in./sec
inches of mercury absolute	in. Hg abs.
Kiloelectron volt	keV
kilogram	kg
kilograms per cubic meter	kg/m^3
kilograms per second	kg/sec
kilometer	km
kilovolt	kV
kilovolt-ampere	kVA
kilowatt	kW
kilowatt-hour	kWh
liter	l
logarithm, Napierian base 2.718	e
mercury	Hg
megavolt-amperes	MVA
megavolt-amperes reactive	MVAr
megawatt	MW
megawatt day	MWD

TABLE 1.1-2 (Continued)

ABBREVIATIONS USED IN THE UFSAR

Words or Term	Abbreviation
megawatt (electric)	MWe
megawatt (thermal)	MWt
megohm	Meg
meter	m
Metric Tonne Uranium	MTU
micron, micro (10^{-6})	μ
mile per hour	mph
milli	m
milliampere	mA
millicurie	mCi
milliliter	ml
millimeter	mm
millimicron	μm
million cubic feet	MMCF
million electron volts	mev
milliroentgen	mR
milliroentgen equivalent man	mrem
millivolt	mV
millivolt amperes	mVA
millivolt amperes reactive	mVAr
milliwatt	mW
minute	min
neutron multiplication factor, effective	K_{eff}
neutron multiplication factor, infinite	$K\infty$
neutrons per square centimeter	n/cm^2
neutrons per square centimeter-second	n/cm^2-sec
ohms, million	Meg
ounces	oz
parts per million	ppm
parts per billion	ppb
percent millirho	pcm
percent millirho per minute	pcm/min
pound	lb
pound mass	lbm
pounds per cubic foot	lb/ft^3
pounds per square foot	lb/ft^2
pounds per square inch	psi
pounds per square inch (absolute)	psia
pounds per square inch (differential)	psid

TABLE 1.1-2 (Continued)

ABBREVIATIONS USED IN THE UFSAR

Words or Term	Abbreviation
pounds per square inch (gage)	psig
radius	r
reactive kilovolt-ampere	kvar
reactive volt-ampere	VAR
reactivity	Δk/k
revolutions per minute	rpm
revolutions per second	rps
roentgen	R
roentgen equivalent man	rem
roentgens per hour	R/hr
root mean square	rms
second	sec
specific gravity	sp gr
square foot	ft^2
square inches	$in.^2$
square mile	mi^2
standard cubic feet	scf
standard cubic feet per minute	scfm
thousand cubic feet	mcf
thousand pounds	kip
thousand pounds per linear foot	k/lf
thousand pounds per square inch	ksi
ton (short ton)	ton
tonne (metric ton, 2,204.62 lb)	t
volt	V
volt alternating current	vac
volt ampere	VA
volt direct current	vdc
volts per phase per Hertz	v/ph./Hz
volume percent	vol %
inch water guage	in. wg or wg
watt	W
weight percent	wt %
wet bulb	wb
yard	yd
year	yr

TABLE 1.1-3

MAJOR BUILDINGS AND STRUCTURES

Administration Building
Auxiliary Transformer
Auxiliary Feedwater Storage Tank
Circulating Water Discharge Structure
Circulating Water Intake Structure
Diesel Generator Building
East Gate House
Emergency Standby Transformer
Essential Cooling Pond (Ultimate Heat Sink)
Essential Cooling Water Discharge Structure
Essential Cooling Water Intake Structure
Fuel Handling Building
Guard Facility
Machine Shop
Main Cooling Reservoir
Main Transformer
Main Steam and Feedwater Isolation Valve Cubicle
Makeup Demineralizer Building
Makeup Discharge Structure
Makeup Pumping Facility
Mechanical and Electrical Auxiliaries Building
Reactor Containment Building; Containment
Sewage Treatment Building
Spillway and Blowdown Facilities
Standby Transformer
Turbine Generator Building
Warehouse
West Gate House
345 kV Switchyard

UFSAR FIGURE 1.1-2
Reference Drawing(s) 9A310F00001

UFSAR FIGURE 1.1-3
Reference Drawing(s) 9A310F00002

1.2 GENERAL PLANT DESCRIPTION

1.2.1 Site Characteristics

1.2.1.1 Location and Size of the Site. The site is located in south-central Matagorda County west of the Colorado River, 8 miles north-northwest of the town of Matagorda and about 89 miles southwest of Houston. It consists of approximately 12,220 acres of land and includes areas being used for a plant, a railroad, and a cooling reservoir. Centerline coordinates for the reactors of Units 1 and 2 are 28°47' 41.772" latitude and 96°02' 53.079" longitude, and 28°47' 41.922" latitude and 96°02' 59.820" longitude, respectively. The universal transverse mercator coordinates for Units 1 and 2 reactor centerlines are N-3188669.141 meters and E-788157.126 meters, and N-3188669.219 meters and E-787974.143 meters, respectively. The plant is located about 12 miles south-southwest of Bay City and about 13 miles east-northeast of Palacios between FM (farm-to-market road) 1095 and the Colorado River (Figure 1.2-1).

1.2.1.2 Description of Plant Environs. The 7,000-acre Main Cooling Reservoir (MCR) is fully enclosed with an embankment; baffle dikes direct the flow of water. The station is located at the north end of the MCR with condenser cooling water being discharged into the western half of the MCR and returned to the power plant intake through the eastern half of the MCR. The circulation route is shown on Figure 1.2-2. Blowdown to control MCR water quality is discharged back to the Colorado River. A spillway is provided to release flood waters resulting from direct rainfall on the MCR surface level.

1.2.1.3 Design Bases on Site Environs. Plant grade is at 28 ft mean sea level (MSL); the maximum water level obtained during any flooding phenomenon is El. 50.8 ft. Flood protection requirements and resultant plant design features are discussed in Section 3.4.4.

Systems, structures and components important to safety are protected against the effects of the maximum water surface.

1.2.1.4 Statement of Historical Significance. A review of the "National Register of Historic Places in Texas" (1979) and the "Guide to Official Texas Historical Markers" (1975) shows no listing for historic structures or historic places within 5 miles of the plant. Both documents are published by the Texas Historical Commission.

1.2.2 Plant Description

1.2.2.1 General Arrangements of Structures and Equipment. The general arrangement of the major structures on the site is shown on Figures 1.2-3 and 1.2-4. The general arrangement drawings of the individual structures are listed in Table 1.2-1.

The station is composed of two units, each having an identical pressurized water reactor (PWR) Nuclear Steam Supply System (NSSS) and turbine generator (TG). The units are arranged using a "slide-along" concept which results in Unit 2 being similar to Unit 1, and 600 ft away; the standby ttransformers are arranged using a "mirror-image" concept.

The principal structures to be located on the plant site are listed in Table 1.1-1.1 and shown on Figures 1.2-3 and 1.2-4.

The shared facilities for Units 1 and 2 are:

1. Main Cooling Reservoir (MCR)

2. Circulating Water Intake Structure (CWIS)

3. Circulating Water Discharge Structure (CWDS)

4. Makeup Pumping Station

5. Spillway and Blowdown Facilities

6. Fire Protection System (only certain components are shared)

7. Potable and Sanitary Water Systems (PSWS)

8. Switchyard and 138 kV Emergency Transformer and Standby Transformers

9. Essential Cooling Pond (ECP)

10. Essential Cooling Water Intake and Discharge Structures

11. Makeup Demineralizer System

12. Oily Waste System

13. Auxiliary Boiler (AB) (no longer in use)

1.2.2.2 Nuclear System. The NSSS is a Westinghouse Electric Corporation four loop PWR.

1.2.2.2.1 Reactor Core and Control Rods: The reactor has a multi-region-cycled core. The fuel rods are Zircaloy tubes containing slightly enriched uranium dioxide fuel. The fuel assembly is of the canless type basically consisting of guide thimbles attached to top and bottom grids, and top and bottom nozzles. The fuel rods are held by spring clip grids which provide very stiff support.

The integrity of the fuel rods is ensured by designing to prevent excessive fuel temperatures, excessive internal rod gas pressures due to fission gas releases, and excessive cladding stresses and strains.

Rod cluster control assemblies (RCCAs) are inserted into guide thimbles of certain fuel assemblies for reactor control. The control rods use hafnium or silver-indium-cadmium as the neutron absorber. Above the core, each cluster of absorber rods is attached to a spider connector and drive shaft that is

raised and lowered by a drive mechanism mounted on the reactor vessel head. Upon reactor trip, the RCCAs are inserted into the core by gravity.

The control rods are designed to shut down the reactor with adequate margin under conditions of normal operation and anticipated operational occurrences, thereby ensuring that specified fuel design limits are not exceeded.

A soluble neutron absorber is utilized for long-term reactivity control and refueling operations.

The reactor core rated thermal power is 3,853 MWt core power plus 21 MWt reactor coolant pump (RCP) energy.

1.2.2.2.2 Reactor Vessel and Internals: The reactor vessel and internals contain and support the fuel. The vessel has a low-alloy carbon steel hemispherical head and bottom, and is clad inside with stainless steel.

1.2.2.2.3 Reactor Coolant System: High-pressure light water serves as the coolant, neutron moderator, reflector, and solvent for the neutron absorber. The Reactor Coolant System (RCS), comprised of four parallel loops (each with a RCP and a steam generator [SG]), is used to transfer the heat generated in the core to the SGs using RCPs to circulate the water. RCS pressure is maintained by means of a pressurizer attached to the hot leg of one of the loops.

The RCS is designed to circulate borated demineralized water at temperatures, pressures and flow rates consistent with the design thermal and hydraulic performance of the NSSS.

1.2.2.2.4 Residual Heat Removal System: The Residual Heat Removal System (RHRS) is used to cool down the RCS following reactor shutdown after the RCS temperature and pressure have been reduced by the Auxiliary Feedwater System (AFWS) and by dumping steam during cooldown. The entire system is located within the Containment. Following cooldown, the RHRS removes decay heat from the reactor core to maintain the desired temperature. The system consists of three independent trains, each having its own pump and heat exchanger (HX).

1.2.2.2.5 Chemical and Volume Control System: The Chemical and Volume Control System (CVCS) maintains the coolant inventory in the RCS. The functions of the CVCS are purification of the reactor coolant, control of the RCS chemistry, regulation of the reactor coolant inventory, control of reactivity in the core, and seal water injection for the RCPs.

The CVCS consists of charging pumps, boric acid transfer pumps, chiller pumps, regenerative HX, letdown HX, and other HXs, tanks, filters and demineralizers.

1.2.2.2.6 Reactor Coolant Pressure Boundary Leak Detection: The Reactor Coolant Pressure Boundary Leak Detection System consists of temperature, level, humidity, and radioactivity sensors with associated instrumentation and alarms. Small leaks are detected by temperature and level changes of systems, increasing sump levels, and humidity and radioactivity concentration changes inside the Containment. Large leaks are detected by changes in reactor coolant inventory and changes in flow rates in process lines.

1.2.2.3 Engineered Safety Features Systems. The following systems are used to directly mitigate the consequences of postulated accidents up to and including the Design Basis Accidents (DBAs) and are classified as Engineered Safety Features (ESF) Systems:

1. Containment Heat Removal System (CHRS)

2. Containment Isolation System (CIS)

3. Emergency Core Cooling System (ECCS)

4. Fuel Handling Building (FHB) Heating, Ventilating and Air Conditioning (HVAC) Exhaust Subsystem

5. Control Room (CR) Habitability Systems

6. Auxiliary Feedwater System (AFWS)

1.2.2.3.1 Reactor Containment: This structure provides a virtually leaktight barrier to prevent escape of fission products to the environment in the unlikely event of a loss of coolant accident (LOCA).

The Reactor Containment is a post-tensioned concrete cylinder with a steel liner plate, hemispherical top, and flat bottom. The overall dimensions of the Containment are:

Cylinder	- Inside Diameter	150ft
	- Height	166 ft-3 in.
	- Wall thickness	4 ft
	- Liner thickness	3/8 in.
Dome	- Inside Radius	75 ft
	- Thickness	3 ft*
	- Liner thickness	3/8 in.
Foundation	- Mat thickness	18 ft
	- Mat elevation (top)	(-) 13 ft-3 in.
	- Mat liner thickness	3/8 in.

* varies from 4 ft to 3 ft in transition zone

The Containment is designed to withstand the internal pressure and coincident temperature resulting from the mass and energy release of a LOCA.

1.2.2.3.2 Containment Heat Removal Systems: Following the unlikely event of a LOCA, heat is removed from and pressure is reduced in the Containment by the Reactor Containment Fan Coolers (RCFCs) and the Containment Spray System (CSS). Following a LOCA, component

cooling water (CCW) is circulated through the RCFCs and borated water from the refueling water storage tank (RWST) is sprayed into the Containment atmosphere. Long-term post-LOCA cooling and pressure reduction of the Containment is provided by switching the CSS suction to the Containment sump and by the RCFCs.

1.2.2.3.3 Containment Air Purification and Cleanup Systems: Borated water followed by trisodium phosphate is used by the CSS to remove iodine from the Containment atmosphere following a LOCA.

1.2.2.3.4 Containment Isolation System: Following a LOCA, the CIS provides the capability to isolate the various system lines penetrating the Containment and prevents the direct release of radioactivity to the environment.

1.2.2.3.5 Combustible Gas Control System: Per 10CFR50.44, hydrogen recombiners are no longer required for design basis accidents.

1.2.2.3.6 Emergency Core Cooling System: The ECCS injects borated water into the RCS following a LOCA to limit core damage, metal/water reaction, and fission product release, and to provide, in conjunction with the control rods, sufficient negative reactivity to assure safe shutdown of the reactor core. Borated water is injected from the accumulators and the RWST. The ECCS also provides long-term, post-accident cooling of the core by recirculating borated water from the Containment sump to the core.

The system consists of three independent trains, each one capable of providing 100 percent of the required flow to the core in the unlikely event of a LOCA. Each train consists of one high-head safety injection pump and one low-head safety injection pump. Heat is removed from the system during recirculation by the residual heat removal HX (low-head pump only). The piping and valving associated with each of the three subsystems are identical. In the event of a steam pipe rupture, the ECCS provides adequate shutdown capability.

1.2.2.3.7 Fuel Handling Building HVAC Exhaust Subsystem: The FHB HVAC Exhaust Subsystem provides adequate filtration to remove radioiodines and particulates from the air above the spent fuel pool as well as the remainder of the FHB in the unlikely event of an accident.

1.2.2.3.8 Control Room Habitability Systems: Habitability systems are provided to ensure that operating personnel can safely occupy the CR following a LOCA. Adequate shielding, air conditioning and filtering systems, health physics, and communications and domestic facilities are provided to allow residence for an extended period of time following the postulated accident.

1.2.2.3.9 Auxiliary Feedwater System: The AFWS provides adequate cooling to the SGs in the event of a normal feedwater (FW) supply interruption. The system consists of four pumps. These pumps take suction from the auxiliary feedwater storage tank (AFST).

1.2.2.4 Engineered Safety Features Support Systems.

1.2.2.4.1 Component Cooling Water System: The Component Cooling Water System (CCWS) acts as an intermediate fluid barrier between the radioactive systems and the Essential

Cooling Water System (ECWS) to reduce the possibility of leakage of radioactivity from the plant to the environment.

The CCWS is designed to provide a continuous supply of cooling water to remove residual and sensible heat from the reactor during normal shutdown, to cool the letdown flow to the CVCS during power operation, to cool various ESF heat loads after a postulated LOCA, and to remove heat from various other plant components during normal operation.

1.2.2.4.2 Essential Cooling Water System: The ECWS supplies cooling for those loads which are necessary for the safe shutdown of the reactor and to mitigate the consequences of postulated accidents. The ECWS also supplies cooling water to various systems during normal operation and shutdown.

Heat rejection to the ECWS during either normal operation, normal shutdown, or DBA conditions is accomplished by three redundant cooling water loops, each having its own pump and motor, piping, valves, and instrumentation. Each loop cools one set of diesel generator heat exchangers, CCW HX, one essential chiller and the CCW pump supplementary cooler.

The required cooling water is taken from the ECP (also ultimate heat sink [UHS]).

1.2.2.4.3 Ultimate Heat Sink: The ECP provides source of cooling water for the ECWS for safe plant shutdown for accident conditions, and is the normal heat sink for plant auxiliary heat loads for normal operating conditions and normal shutdown.

1.2.2.4.4 Standby Diesel Generator System: Three standby diesel generators (DGs) are the onsite standby power sources feeding the Class 1E loads in the event that the offsite power sources become unavailable.

1.2.2.4.5 HVAC Systems: Various HVAC systems, including the ECWS, EAB HVAC System, and other building or component cooling/ventilation systems, are provided to maintain the environment required for ESF components.

1.2.2.5 Reactor Control and Protection Systems. The primary purposes of the Reactor Control and Protection Systems are to provide indication of automatic protection, to exercise proper control to ensure safe and proper reactor operation during steady-state and transient power operations, and to provide initiating signals to mitigate the consequences of accident conditions.

1.2.2.5.1 Reactor Trip System: The Reactor Trip System (RTS) automatically prevents operation of the reactor in an unsafe region by shutting down the reactor whenever preset limits are approached. The safe operating region is defined by several considerations, such as mechanical/hydraulic limitations on equipment and heat transfer phenomena. Therefore, the RTS keeps surveillance on process variables which are directly related to equipment mechanical limitations, such as pressure, pressurizer water level (to prevent water discharge through safety valves, and uncovering heaters), and also on variables which directly affect the heat transfer capability of the reactor, e.g., flow and reactor coolant temperatures. Still other parameters utilized in the RTS are calculated from various process variables. In any event, whenever a direct process or calculated variable exceeds a setpoint, the reactor will be shut down in order to protect against either

gross damage to fuel cladding or loss of system integrity which could lead to release of radioactive fission products into the Containment.

1.2.2.5.2 Engineered Safety Features Actuation System: The ESF Actuation Systems are those instrumentation and control systems that are needed to actuate the equipment and systems listed in Sections 1.2.2.3 and 1.2.2.4.

1.2.2.5.3 Instrumentation and Control Power Supply System: The Instrumentation and Control Power Supply System provides continuous, reliable dc or regulated single-phase ac power to all instrumentation and control equipment required for plant safety.

1.2.2.5.4 Reactor Control System: The Reactor Control System enables the nuclear plant to accept a step load increase or decrease of 10 percent and a ramp increase or decrease of 5 percent per minute within the load range of 15 percent to 100 percent without reactor trip, turbine bypass or pressurizer relief actuation, and is subject to possible xenon limitations.

The system also maintains reactor coolant average temperature (T_{avg}) within prescribed limits by creating the bank demand signals for moving groups of rod cluster control assemblies (RCCAs) during normal operation and operational transients. The T_{avg} control also supplies a signal to pressurizer water level control and steam dump control.

1.2.2.5.5 Rod Control System: The Rod Control System provides for reactor power modulation by manual or automatic control of control rod banks in a preselected sequence and for manual operation of individual banks.

Control rod position is displayed in the control room, and alarms are provided to alert the operator if the required core reactivity shutdown margin is not available due to excessive control rod insertion or if control rod deviation exceeds preset limits.

1.2.2.5.6 Plant Control System Interlocks: Interlocks are provided to prevent further withdrawal of the control banks when signal limits are approached that predict the approach of a departure from nucleate boiling ratio limit or kW/ft limit and to inhibit automatic turbine load change as required by the NSSS.

1.2.2.5.7 Pressurizer Pressure Control: This system functions to maintain or restore the pressurizer pressure to the design pressure ± 35 psi (which is well within reactor trip and relief and safety valve actuation setpoint limits) following normal operational transients that induce pressure changes. It functions by control (manual or automatic) of heaters and spray in the pressurizer. It also provides steam relief by controlling the power operated relief valves.

1.2.2.5.8 Pressurizer Water Level Control: This control system establishes, maintains and restores pressurizer water level within specified limits as a function of the average coolant temperature. Changes in level are caused by coolant density changes induced by loading, operational and unloading transients. Level changes are produced by means of charging flow control (manual or automatic) as well as by manual selection of letdown orifices. It maintains coolant level in the pressurizer within prescribed limits by actuating the charging and letdown system, thus providing control of the reactor coolant water inventory.

1.2.2.5.9 Steam Generator Water Level Control: This system establishes and maintains the SG water level within predetermined limits during normal operation and operating transients. It restores the SG water level to within predetermined limits at unit trip conditions, provided that FW isolation has not occurred and the FW pump turbine supplied with steam. Steam generator water inventory control to maintain a minimum heat sink for the RCS is manual or automatic through the use of the FW control valves.

1.2.2.5.10 Steam Dump Control: This control system permits the nuclear plant to accept a 50 percent load rejection without incurring reactor trip or lifting a main steam (MS) safety valve. Steam is dumped to the condenser as necessary to accommodate excess power generation in the reactor during turbine load reduction transients.

This control system ensures that stored energy and residual heat are removed following a reactor trip to bring the plant to equilibrium no-load conditions without actuation of the SG safety valves. It also maintains the plant at no-load conditions and permits a manually controlled cooldown of the plant.

1.2.2.5.11 Incore Instrumentation: Incore instrumentation provides information on the neutron flux distribution and the core outlet temperatures at selected core locations.

1.2.2.5.12 Qualified Display Processing System: The Qualified Display Processing System (QDPS) is an integrated system designed to perform the following functions:

1. Data acquisition and qualified displays for post-accident monitoring.

2. Safety-grade control and position indication, as applicable, of several safety-related valves.

3. Data acquisition, display and control to address the separation requirements of the South Texas Project Electric Generating System (STPEGS) design approach to a CR or relay room.

4. SG water level compensation for the effect of temperature changes in the reference leg fluid.

5. Averaging for RCS hot leg RTD signals.

The system functions are performed by several subsystems. These subsystems, though related, have sufficient independence such that the individual functions can be performed with maximum reliability and minimum unnecessary interactions between functions.

1.2.2.5.13 Emergency Response Facilities Data Acquisition and Display System: This data acquisition system is described in Sections 1.2.2.14.1 and Sections 7.5.7.

1.2.2.6 Steam and Power Conversion System

1.2.2.6.1 Turbine Generator: The turbine generator (TG) is a Westinghouse tandem compound, six-flow, 40-in. last-stage-blade, 1,800-rpm machine. It is installed outdoors on a turbine pedestal. The turbine guaranteed rating is 1,311,838 kW at a backpressure of 3.5 in. Hg abs. and 0

percent makeup. The rating of the electric generator is 1,504,800 kVA at 60 Hz and a 0.90 power factor.

1.2.2.6.2 Main Steam System: The MS System transfers the steam from the outlet of the SGs to the turbine, where it is converted into mechanical energy that drives the electric generator. The steam is also used for various other services, such as shaft steam seals and turbine drives for main and auxiliary FW pumps.

Steam generator safety and power-operated relief valves are provided to protect the SG and the MS System in the event of high steam pressure.

1.2.2.6.3 Condenser: The condenser is a three-shell, single-pass type located below the turbine. Cooling water from the MCR passes through the tubes with the condensing steam flowing outside the tubes. Condensate is collected in the hotwell where the condensate pumps take their suction and supply the FW system.

1.2.2.6.4 Condenser Air Removal System: The Condenser Air Removal System removes air from the condenser. During operation, it removes noncondensible gases which are then discharged to the unit vent and monitored for radiation. The evacuation system consists of three 50-percent-capacity motor driven vacuum pumps which operate in parallel.

1.2.2.6.5 Turbine Gland Sealing System: The Turbine Gland Sealing System is designed to prevent in leakage of air to the turbine or outleakage of steam along the turbine shaft. The system provides steam for sealing the main turbine and SG feed pump turbine shafts. The MS System is the normal source of sealing steam. Auxiliary Steam (AS) may be used during normal shutdown. The leakoff steam and air mixture flows to the gland seal condenser, which is cooled by condensate. The condensed leakage is returned to the main condenser, and noncondensible gases are exhausted to the atmosphere.

1.2.2.6.6 Turbine Bypass System: The Turbine Bypass System provides an artificial steam load in the Steam and Power Conversion Systems when necessary. The system is rated at 40-percent of plant design steam flow. This bypass flow allows the turbine to take a 50-percent load reduction without reactor trip or lifting of SG safety valves. The bypass steam is equally distributed to all condenser shells to prevent uneven turbine exhaust backpressures. The Turbine Bypass System is not required for any safety function, but it provides operational flexibility and minimizes steam relief to the atmosphere.

1.2.2.6.7 Condensate and Feedwater System: The Condensate and FW Systems convey condensed steam from the condenser hotwells and the drains from the regenerative feedwater heating cycle to the SG while maintaining the water inventories throughout the cycle.

The condensate pumps take suction from the condenser hotwells and discharge through the FW heaters to the deaerator.

The low-pressure heater drip pumps take suction from the flash tanks that collect drains from the two lowest pressure FW heaters and pump the drips into the condensate heater.

Condensate flows to and from the secondary makeup tank (SMT) to maintain the proper inventory of water in the secondary cycle.

Feedwater booster pumps draw deaerated water from the deaerator storage tank to provide ample net positive suction head (NPSH) to the feedwater pump suction.

The three steam-driven FW pumps discharge through the highest pressure FW heater into the SGs.

A Condensate Polishing Demineralizer System is provided to remove dissolved and suspended solids from the condensate.

1.2.2.6.8 Steam Generator Blowdown System: The SG blowdown system provides the means to continuously blowdown the SG to maintain the prescribed water chemistry in the SGs. It also removes the dissolved solids and corrosion products from the blowdown stream to make it suitable for reuse in the condenser hotwell.

1.2.2.7 Electrical Systems.

1.2.2.7.1 Utility Grid Description: Four transmission service providers tie into the STPEGS switchyard: CenterPoint Energy, AEP Texas Central Company (TCC), City of Austin, and City Public Service Board of San Antonio. The combined electrical grids of the four systems presently consist of interconnected fossil-fuel plants which serve approximately 51,354 square miles of area with an overlaid 345/138/69 kV transmission system.

1.2.2.7.2 Onsite Electrical System: The Onsite Electrical System of each unit consists of the unit auxiliary transformer, four 13.8 kV auxiliary busses, three 13.8 kV standby busses, five 4.16 kV auxiliary transformers, two normal 4.16 kV auxiliary busses, three ESF 4.16 kV auxiliary buses and three DGs. The three ESF 4.16 kV auxiliary busses feed the Class 1E ac power loads. The Class 1E 125 vdc power system consists four independent subsystems (channels). Channels I and IV each consist of two inverters, one battery, and two battery chargers. Channels II and III each consist of one inverter, one battery, and two battery chargers.

The Onsite Electrical System is designed to supply the functional requirements of all auxiliary loads required for all modes of plant operation. Sufficient instrumentation and protective control devices are provided to ensure reliability and availability of the system.

1.2.2.7.3 Offsite Electrical System: The Offsite Electrical System consists of two (345/13.8/13.8 kV) standby transformers, the 138 kV emergency transformer (138/13.8 kV), two main generators, two main power transformers (345/25 kV), the 345 kV lines connecting the main power transformers and the standby transformers to the switchyard, and the 345 kV switchyard, and the nine 345 kV transmission circuits from the STPEGS 345 kV switchyard to the interconnecting grids, and the 138 kV radial line out of TCC’s Blessing Substation circuit to the 138 kV emergency transformer.

The transmission system provides reliable sources of offsite power for supplying plant auxiliary power systems for plant startup, shutdown or at any time that power is unavailable from the unit's

main generator. The normal power supply to unit balance-of-plant (BOP) auxiliary loads is provided through the unit auxiliary transformer connected to the generator bus.

The unit auxiliary transformers can provide power from the main generator or from the 345 kV switchyard through the main transformers (with generator breakers open) to all that unit's BOP and ESF loads (Fig. 8.2-3). The standby transformers are individually supplied by separate and independent overhead 345 kV ties from the 345 kV switchyard. These 345 kV ties to the standby transformers are connected to two separate 345 kV busses. Each transformer can provide offsite power to all ESF busses in both units and two 13.8 kV auxiliary busses.

1.2.2.8 Radioactive Waste Management Systems.

1.2.2.8.1 Liquid Waste Processing System: The Liquid Waste Processing System (LWPS) collects and processes potentially radioactive liquid wastes. The LWPS is designed to receive, segregate, process, recycle, and discharge liquid wastes. Provisions are made to sample and analyze fluids before they are discharged. The system design considers potential personnel radiation exposure and ensures that quantities of radioactive releases to the environment meet the requirements of Appendix I of 10CFR50 and are as low as is reasonably achievable (ALARA).

Under normal plant operation, release from the LWPS will be a small fraction of the concentration limits as defined in Appendix B of 10CFR20.

1.2.2.8.2 Gaseous Waste Processing System: The Gaseous Waste Processing System (GWPS) removes and processes fission product gases from the RCS, CVCS, and other miscellaneous sources. The design objectives of the GWPS are two-fold: first, to collect fission product gases from the various sources; and second, to process and control the release of gaseous radioactive effluents to the sit environs so that the total radiation exposure to offsite persons is ALARA and does not exceed applicable regulations.

1.2.2.8.3 Solid Waste Processing System: The design objective of the Solid Waste Processing System is to provide a practicable means for collection, processing, packaging, temporary storage, and preparation for shipment of the solid radioactive wastes generated during operation of each unit.

1.2.2.8.4 Radiation Monitoring System: The Radiation Monitoring System (RMS) is a group of independent radiation monitors used to measure the levels of radioactivity within various process streams, ventilation ducts, and plant general areas. The monitors are designed to provide information on the radiation levels to the plant main control room as well as locally at the monitors. The monitors initiate alarm signals when predetermined setpoints are exceeded and initiate various control functions as required when selected alarms are initiated. The RMS continuously records the levels of radiation in the various streams and areas to indicate trends of increasing radiation so as to aid in achieving ALARA radioactivity releases and personnel exposures.

1.2.2.9 Cooling Water Systems.

1.2.2.9.1 Auxiliary Cooling Water System: The Auxiliary Cooling Water System (ACWS) is used to service nonsafety-related equipment in the turbine plant and nonsafety-related HVAC chillers.

The ACWS consists of a closed (demineralized water) cooling loop servicing a portion of the auxiliary coolers, and an open (brackish water) cooling loop servicing the remainder of the auxiliary coolers and transferring the total auxiliary cooling water heat load to the MCR.

The ACWS is designed to transfer the heat loads from various nonsafety components in the Turbine-Generator Building (TGB), including the nonsafety-related HVAC chillers to the MCR.

1.2.2.9.2 Circulating Water System: The Circulating Water System supplies cooling water from the MCR to the main condensers of each unit to transfer the steam cycle rejected heat to the MCR.

Four 25-percent-capacity vertical wet pit circulating water pumps take suction from the intake structure and discharge to a common header. The pumps are located in each bay, oriented with respect to each other to exclude the adverse effects of vortices and to provide a proper flow path and suction velocities. The cooling water is then supplied to a common condenser distribution header by two lines. This arrangement allows equal cooling water flow to each of the three main condenser shells.

1.2.2.10 Other Water Systems.

1.2.2.10.1 Condensate Storage Facilities: The condensate storage facilities consist of the SMT, the demineralized water storage tank, the demineralized water transfer pumps, and related piping.

The demineralized water makeup is supplied from the demineralized water storage tank (DWST) to the users identified in Section 9.2.6.1.

1.2.2.10.2 Makeup Demineralized Water System: Water is supplied to the Makeup Demineralized Water System (MDWS) from the service water pumps which take suction from the service water storage tank. Each demineralizer train consists of a softener, a reverse osmosis bank, a shared reverse osmosis product storage tank, a cation exchanger, a shared vacuum degasifier, an anion exchanger, and a mixed-bed exchanger.

The MDWS is designed to produce a sufficient quantity of water for the following:

1. Reactor Coolant System

2. Reactor Coolant Auxiliary Systems

3. Condensate and Feedwater Systems

4. Preoperational tests and plant startup

1.2.2.10.3 Potable and Sanitary Water System: The PSWS provides treated and filtered water in sufficient quantity and of sufficient pressure to satisfy all requirements for human consumption and for the operation of all plumbing fixtures in the personnel facilities of Units 1 and 2. The water source is from wells. The PSWS is designed to supply, as a minimum, the quality of water required by local and state regulations. The system also supplies makeup for the potable emergency water storage tank for the control room.

Sanitary waste water from the discharge of plumbing fixtures is routed to the Station Sewage Treatment System, which is designed to produce the quality of effluent which satisfies, as a minimum, the applicable local and state effluent release standards as discussed in Section 9.2.4.

The potable water is chlorinated using a Sodium Hypochlorite Feed System designed to maintain a residual of 0.2 ppm chlorine in the effluent of the potable water tanks. The potable water storage tanks are fed by the well water pumps. The storage tanks are common to Units 1 and 2.

1.2.2.10.4 Equipment and Floor Drain System: The Equipment and Floor Drain System (EFDS) is designed to collect and convey the various operational waste liquids from their points of origin to their points of collection for processing or ultimate disposal under controlled conditions.

1.2.2.10.5 Reactor Makeup Water System: The Reactor Makeup Water System (RMWS) provides distribution of demineralized water from the demineralized water tank to reactor plant systems requiring demineralized water, including the CVCS, RCS Pressurizer Relief Tank and Reactor Coolant Pump Standpipe.

The RMWS also stores and distributes recyclable reactor grade water from the Boron Recycle System (BRS) and Liquid Waste Processing System (LWPS). The reactor makeup water storage tank (RMWST) stores reactor grade water which is transferred to seismic Category I, systems requiring reactor grade water in the event of loss of normal source of makeup water provided by the demineralized water tank. These systems include CCWS Emergency Makeup and Spent Fuel Pool Emergency Makeup.

1.2.2.11 Other Systems and Facilities.

1.2.2.11.1 Fuel Storage and Handling:

1.2.2.11.1.1 Fuel Handling System - The Fuel Handling System (FHS) is designed to provide a safe, effective means of transporting and handling fuel from the time it reaches the station until it leaves the station after post-irradiation cooling. The system is designed to minimize the possibility of mishandling or improper operation which could cause fuel assembly damage and/or potential fission product release.

Each unit of the STPEGS has an independent FHS within separate and independent FHBs. Each FHB abuts the south side of the Reactor Containment Building (RCB) and is adjacent to the west side of the Mechanical-Electrical Auxiliaries Buildings (MEABs) of each unit.

1.2.2.11.1.2 New Fuel Storage – New fuel assemblies may be stored in a reinforced concrete pit located in each FHB. The new fuel storage pit, which is an integral part of each FHB,

provides temporary dry storage for approximately one-third of a core. The new fuel storage pit access hatch has a three-section cover to minimize the introduction of dust and debris into the new fuel storage pit.

New fuel assemblies may also be stored in the Spent Fuel Pool prior to core loading. The description of spent fuel storage in the Spent Fuel Pool bounds and describes new fuel storage as well.

1.2.2.11.1.3 Spent Fuel Storage – Each unit of the STPEGS has independent spent fuel storage facilities. These facilities are located in both the Containment and the FHB.

The spent fuel storage facilities are designed for the underwater storage of spent fuel assemblies (SFAs) and control rods after their removal from the reactor vessel.

Spent fuel storage space is provided to accommodate about one-third of a core in the Containment fuel pool and approximately 10 cores in the spent fuel pool (SFP) located in the FHB.

Shielding for the spent fuel storage arrangement is adequate to protect plant personnel from exposure to radiation during all phases of spent fuel handling and storage.

In addition to storage of new and irradiated fuel assemblies and RCCAs (including other irradiated fuel inserts), the SFP provides storage, shielding, and cooling as needed for other plant components. These components include storage of fuel handling related tooling and fuel assembly inserts placed in fuel (collectively referred to as Associated Fuel Equipment, or AFB), radioactive or contaminated plant components (referred to as Other Than Fuel, or OTF), and filters from cleanup systems, such as Tri-Nukes. Plant procedures are used to track and control non-fuel storage in the SFP.

1.2.2.11.1.3.1 Spent Fuel Dry Cask Storage – STPEGS has established an Independent Spent Fuel Storage Installation (ISFSI) within the security protected area of the site.

The Spent Fuel Dry Cask Storage operations at STPEGS will be conducted under a general license in accordance with Subpart K of 10 CFR Part 72. The general license issued by 10 CFR 72.210, "General license issued," authorizes a 10 CFR Part 50 nuclear power plant license to store spent fuel at an onsite ISFSI. Subpart K of 10 CFR Part 72 also includes 10 CFR 72.212, "Conditions of general license issued under 10 CFR 72.210," which requires the use of a dry cask storage system that is pre-approved by the Nuclear Regulatory Commission, as evidenced by its listing in 10 CFR 72.214.

The ISFSI boundary has a security fence to establish the protected area for the ISFSI. A nuisance fence is included on the perimeter of the outside isolation zone to minimize intrusion detection alarms.

The STPEGS ISFSI uses the Holtec HI-STORM FW vertical cask storage overpack and the Holtec MPC-37 multi-purpose canister (MPC), as described in the HI-STORM FW FSAR and approved by the Nuclear Regulatory Commission via the HI-STORM Certificate of Compliance No. 1032. The ISFSI concrete pad has a capacity for 90 vertical spent fuel storage casks.

1.2.2.11.1.4 Spent Fuel Pool Cooling and Cleanup System – The Spent Fuel Pool Cooling and Cleanup System (SFPCCS) is designed to remove the decay heat generated by SFAs stored in

the SFP and/or the in-Containment temporary storage area. A second function of the system is to maintain visual clarity and purity of the spent fuel cooling water and the refueling water.

The SFPCCS demineralizers and filters are designed to provide adequate purification to permit unrestricted access for plant personnel to the spent fuel storage areas and maintain optical clarity of the spent fuel pool water. The optical clarity of the SFP surface is maintained by use of the system's skimmers and skimmer filter.

SFPCCS piping is arranged so that failure of any pipeline cannot drain the spent fuel pool or the in-Containment temporary storage area below a depth of approximately 23 ft of water over the top of the stored SFAs.

1.2.2.11.2 Process Sampling System: The Process Sampling System (PSS) provides a means of obtaining representative fluid (liquid and gas) samples for laboratory or on-line analysis. The analytical results are used to monitor water quality, to determine demineralizer efficiencies, and to evaluate leakage, corrosion product, and activity levels. Safety features are provided to protect laboratory personnel and to limit radiation exposure during sampling.

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1.2.2.11.3 Auxiliary Steam System: The AS System consists of an auxiliary boiler (no longer in use), along with associated piping, valves, instrumentation, combustion controls, and support equipment.

The AS System is designed to provide steam to the various plant system during the various station operating modes. The AS System does not supply steam to safety-related equipment.

1.2.2.11.4 Compressed Air Systems:

1.2.2.11.4.1 Instrument Air System – For each unit, four instrument air compressors are provided, with one normally operating and the others on standby. A decrease in instrument air header pressure to a preset point initiates start of the next standby instrument air compressor, then the third and fourth compressors as required.

1.2.2.11.4.2 Service Air System – The service air system is slaved off of the instrument air system, therefore all service air is provided by the instrument air system. In the event of a loss of instrument air or low instrument air pressure then service air is isolated via a service air isolation valve.

1.2.2.11.5 Plant Lighting Systems: The Plant Lighting System consists of a Normal ac, Essential ac and Emergency dc Lighting System. Lighting intensities are designed to provide indoor and outdoor illumination consistent with the Illumination Engineering Society (1972) recommendations and meet Occupational Safety and Health Act requirements.

Lighting sources are selected with consideration for personnel safety, environmental conditions, and ease of maintenance. Mercury vapor lamps, mercury switches, fluorescent lamps, as well as aluminum fixtures, or raceway systems are not used in the RCB, FHB and radwaste treatment area, or areas exposed to chemical spray or radioactive fluids. However, mercury is used in a

mercury/sodium amalgam for temporary underwater lights used during refueling activities for the Reactor Cavity and for permanent underwater lights for the Spent Fuel Pool and the Fuel Transfer Canal. Incandescent lamps are used in the RCB, FHB, and radwaste treatment area.

1.2.2.11.6 Communications Systems: Several communications systems are installed to provide reliable intraplant and offsite transfer of information. These include:

1. A telephone and microwave system
2. An in-plant Public Address System.
3. A dial-up Personal Radio Pager System
4. A Very High Frequency Mobile Radio System, providing communications to maintenance and supervisory personnel.
5. A microwave system, connecting the plant to the CenterPoint Energy Control Center.
6. Two-Way Radio System, providing communication between control base stations, mobile units, and hand held portables
7. Fire and evacuation alarm
8. An independent Fuel Loading Communication System
9. A separate maintenance jack communication system
10. Emergency telephone communications from the plant site to Bay City
11. Radio communications with proper state and local government authorities

1.2.2.11.7 Fire Protection System: The basis for design of the Fire Protection System is the capability to detect, alarm, control, and extinguish any fire or probable combinations of fires which might occur within the plant area. The various component parts of the Fire Protection System are designed in accordance with the National Fire Codes and are generally based on recommendations of American Nuclear Insurers (formerly NEPIA).

Fire detection devices are provided throughout the plant area to detect fire and alert the control room operators by activation of fire alarms. In plant areas where toxic inert gas is used for fire protection, personnel alarms are provided in accordance with the National Fire Codes.

1.2.2.11.8 Diesel Generator Systems:

1.2.2.11.8.1 Diesel Generator Fuel Storage and Transfer System – The DG Fuel Storage and Transfer System for each unit is furnished with three independent fuel trains, one for each emergency DG.

Each fuel train consists of a storage tank and the necessary piping, valves and instrumentation. Each DG fuel oil storage tank has a usable capacity of approximately 67,000 gallons of fuel (Section 9.5.4.2). A normally isolated line is connected to the storage tank truck fill line from the Auxiliary Fuel Oil Storage Tank. This connection may be used for replenishing the fuel used for testing the DGs. Each tank is provided with a drain, vent with flame arrestor, truck fill, and inspection manhole cover.

1.2.2.11.8.2 Diesel Generator Cooling Water System – A Cooling Water System is furnished for each DG engine. This system is of the forced-circulation engine jacket water type which directly removes heat from the engine by means of a water jacket and absorbs heat from the air cooler and fuel cooler. The Forced-Circulating Engine Jacket Water System consists of an engine-driven pump, a standby pump, a circulating pump, a jacket water HX, a standpipe, an electric heater, and the required piping an instrumentation.

The jacket water HX heat load is removed by the ECWS. During diesel engine operation, the engine-driven pump circulates the forced-circulating engine jacket water.

1.2.2.11.8.3 Diesel Generator Starting System – Each DG is provided with two redundant Compressed Air Starting Systems, either of which is capable of starting the engine without outside power and both of which are designed to supply a sufficient quantity of air from redundant air receivers to ensure a successful starting operation independent of normal plant power source.

Each Starting Air System includes two motor-driven air compressors, two air receivers, two air dryers, two starting air valves, connecting pipes, and instrumentation and controls.

1.2.2.11.8.4 Diesel Generator Lubrication System – The DG Lubrication System is designed to provide a self-contained lube oil system for each DG engine. The equipment is located within the DG compartments. The lubrication system of each engine includes a direct engine-driven filter/prelube pump, lubricating oil filters and strainers, a lube oil cooler, an electric heater, and all the necessary valves, fittings and instrumentation.

1.2.2.12 Heating, Ventilating and Air-Conditioning System.

The following systems are included within the Electrical Auxiliary Building (EAB) HVAC Systems:

1. Control Room (CR) Envelope HVAC System

2. EAB Main Area HVAC System

3. Technical Support Center (TSC) HVAC System

4. Essential Chilled Water System

1.2.2.12.1 Control Room Envelope and Electrical Auxiliary Building: Separate HVAC Systems are provided for the CR Envelope and the Electrical Auxiliary Building. The CR Envelope HVAC System serves the emergency living quarters (kitchen, toilet, etc.), Relay Room and Computer Room in addition to the CR.

The EAB HVAC System serves the following areas within the building:

1. Battery Rooms

2. Miscellaneous Electrical Equipment Rooms

3. Essential Switchgear Rooms

4. Cable Spreading Rooms

5. Records Room

6. Motor Generator Set Room

7. Central Alarm Station (CAS)

8. Miscellaneous Offices

9. Control Rod Drive System Room

10. Storage Rooms

11. Electrical Penetration Space

The CR Envelope and Electrical Auxiliary System each consist of three 50-percent-capacity redundant equipment trains. Each train is designed to function during all modes of operation including shutdown, hot standby, normal operation, postulated accident condition, and loss of offsite power.

The CR Envelope HVAC System is designed to ensure the habitability of the control room envelope and permit safe shutdown of the plant as may be required under normal or accident conditions.

1.2.2.12.2 Mechanical Auxiliary Building: The MAB HVAC System consists of the following subsystems:

1. Main Supply Subsystem – This subsystem provides the MAB with ventilation to control the thermal environment inside the building.

2. Supplementary Coolers Subsystem – This subsystem is used to cool the safety-related and nonsafety –related equipment within the MAB.

3. Main Exhaust Subsystem – This subsystem exhausts ventilation air from the building and maintains a negative pressure in the building relative to the outside.

4. Supplementary Exhaust and Filtering Subsystem – This subsystem filters and exhausts air from the sample room and the laboratory hoods.

5. Supplementary Chiller Subsystem – This subsystem supplies chilled water to the supplementary cooling coils serving the laboratories, locker rooms, sample rooms, FHB and miscellaneous offices.

1.2.2.12.3 Fuel Handling Building Heating, Ventilating, and Air-Conditioning System: The FHB HVAC System is designed to control the environment inside the building to provide a suitable environment for personnel, assure integrity of equipment and controls, and in the unlikely event of a fuel handling accident, to limit site boundary dose to within the guidelines of 10CFR100 by directing the exhaust air from the SFP and from the building through iodine removal carbon filters and high-efficiency particulate air (HEPA) filters using safety-related exhaust fans. Cooling is provided for ECCS pump cubicles and valve rooms with safety-related fan-coil units.

1.2.2.12.4 Diesel Generator Building: The Diesel Generator Building HVAC System is designed to control the environment inside the building.

1.2.2.12.5 Reactor Containment Building: The RCB HVAC System consists of the following subsystems.

1.2.2.12.5.1 Reactor Containment Fan Cooler Subsystem – This subsystem is provided to limit the air temperature during normal operation and to remove heat resulting from a postulated LOCA, thereby reducing the pressure within the RCB. The subsystem consists of a total of six units, with two units in each independent train.

1.2.2.12.5.2 Containment Carbon Units Subsystem – The Containment Carbon Units Subsystem is designed to permit cleanup of the Containment atmosphere prior to limited personnel access at power. The subsystem consists of two 50-percent filtration units.

1.2.2.12.5.3 Control Rod Drive Mechanism Ventilation Subsystem – The Control Rod Drive Mechanism (CRDM) Ventilation Subsystem is designed to induce air through the CRDM shroud and to exhaust the air after absorbing heat within the shroud. The subsystem consists of three 50-percent ventilation fans.

1.2.2.12.5.4 Reactor Cavity and Reactor Support Ventilation Subsystem – The Reactor Cavity and Reactor Support Ventilation Subsystem is provided to cool the reactor cavity wall and supports, and to supply ventilation air to cool the out-of-core instrumentation. The subsystem consists of two 100-percent supply fans and two 100-percent support exhaust fans.

1.2.2.12.5.5 Main Steam Isolation Valve Cubicles Ventilation Subsystem – This subsystem is provided to maintain the environment in the MS valve area and in the AFW pump area. Each train is provided with a separate ventilation system.

1.2.2.12.5.6 Normal Containment Purge Subsystem – The Normal Containment Purge Subsystem is used to purge the Containment atmosphere after shutdown to maintain radioactivity within appropriate limits for personnel access.

1.2.2.12.5.7 Supplementary Containment Purge Subsystem – The Supplementary Containment Purge Subsystem is provided to purge the Containment atmosphere of airborne

radiation during reactor operation for limited access by maintenance personnel. The subsystem is also available for post-accident containment gas control.

1.2.2.12.5.8 Containment Cubicles Exhaust Subsystem – The Containment Cubicles Exhaust Subsystem provides positive exhaust from the various cubicles inside the Containment for heat removal purposes. Two 50-percent trains with two 100-percent fans are provided.

1.2.2.12.5.9 Tendon Gallery Tunnel Ventilation Subsystem – The Tendon Gallery Tunnel Ventilation Subsystem is provided to ventilate the tendon gallery tunnel for personnel access. Two 50-percent fans are provided.

1.2.2.12.5.10 RCB Chilled Water Subsystem – The RCB Chilled Water Subsystem provides the RCFC cooling coils with chilled water. The subsystem consists of three 50-percent water chillers and pumps.

1.2.2.12.6 Turbine Generator Building: The Turbine Generator Building (TGB) HVAC System controls the thermal environment inside the building and provides the building with a continuous source of fresh air to purge the inside atmosphere from possible process and steam line leakage.

1.2.2.13 Shielding. The primary design objective of the plant radiation shielding is to protect plant operating personnel and the general public against radiation exposure from the various sources of ionizing radiation in the plant during normal operating conditions, anticipated operational occurrences, postulated accident conditions, and maintenance.

1.2.2.14 Emergency Response Facilities.

1.2.2.14.1 Emergency Response Facilities Data Acquisition and Display System: The Emergency Response Facilities Data Acquisition and Display System (ERFDADS) operates as a distributed system to provide plant and environmental data to aid operators and management in the control room, Technical Support Center (TSC), and Emergency Operations Facility (EOF) to respond quickly to abnormal operating conditions and mitigate the consequences of an accident.

1.2.2.14.2 Technical Support Center: The TSC is the onsite TSC facility for emergency response. When activated, the TSC is staffed by predesignated technical, engineering, senior management, and other licensee personnel, and five predesignated NRC personnel. During periods of activation, the TSC operates uninterrupted, to provide plant management and technical support to plant operations personnel, and to relieve the reactor operators of peripheral duties and communications not directly related to reactor system manipulations. The TSC performs the EOF functions for the Alert Emergency class and for the Site Area Emergency class and General Emergency class until the EOF is functional. The TSC is located in the Electrical Auxiliary Building (EAB) at El. 72 ft.

1.2.2.14.3 Operational Support Center: When activated, the Operational Support Center (OSC) is the onsite area separate from the control room where predesignated operations support personnel assemble. The OSC is located in the Mechanical Auxiliary Building (MAB) at El. 41 ft.

1.2.2.14.4 Emergency Operations Facility: The EOF is a licensee-controlled and operated facility. The EOF provides for management of overall licensee emergency response, coordination of radiological and environmental assessment, determination of recommended public protective actions, and coordination of emergency response activities with federal, state, and local agencies.

When the EOF is activated, it will be staffed by predesignated emergency personnel identified in the emergency plan. A designated senior licensee official will manage licensee activities in the EOF.

Facilities are provided in the EOF for the acquisition, display, and evaluation of radiological and meteorological data and containment conditions necessary to determine protective measures. These facilities are used to evaluate the magnitude and effects of actual or potential radioactive releases from the plant and to determine dose projections.

The EOF is a separate facility located in Bay City, Texas approximately 12.5 air miles north north-east of the Station, in the South Texas Project Center for Energy Development building.

1.2.2.15 Independent Spent Fuel Storage Installation: The STPEGS site contains an Independent Spent Fuel Storage Installation (ISFSI) as shown on Figure 1.2-3. The ISFSI consists of a concrete pad with space for 90 natural convection air-cooled, HI-STORM FW shielded dry spent fuel storage casks, each capable of storing 37 spent nuclear fuel assemblies in a welded multiple purpose container. The ISFSI is inside the security protected area.

TABLE 1.2-1

GENERAL ARRANGEMENT DRAWINGS

Figure Number	Title	Reference Number
1.2-5	General Arrangement Turbine Generator Building Plan	
	El. 29'-0" Area A – (Sheet 1 of 4)	6G01-9-M-00007-6
	El. 29'-0" Area B – (Sheet 2 of 4)	6G01-9-M-00008-11
	El. 29'-0" Area C – (Sheet 3 of 4)	6G01-9-M-00009-10
	El. 28'-0" & 28'-6" Area F – (Sheet 4 of 4)	6G01-9-M-00019-7
1.2-6	General Arrangement Turbine Generator Building Plan	
	El. 55'-0" Area A - (Sheet 1 of 3)	6G01-9-M-00010-3
	El. 55'-0" Area B – (Sheet 2 of 3)	6G01-9-M-00011-6
	El. 55'-0" Area C – (Sheet 3 of 3)	6G01-9-M-00012-8
1.2-7	General Arrangement Turbine Generator Building Plan	
	El. 83'-0" Area A - (Sheet 1 of 3)	6G01-9-M-00013-0
	El. 83'-0" Area B – (Sheet 2 of 3)	6G01-9-M-00014-7
	El. 83'-0" Area C – (Sheet 3 of 3)	6G01-9-M-00015-7
1.2-8	General Arrangement Turbine Generator Building Section "A-A"	6G01-9-M-00016-6
1.2-9	General Arrangement Turbine Generator Building Section "B-B" North End – (Sheet 1 of 2)	6G01-9-M-00017-6
	Section "B-B South End – (Sheet 2 of 2)	6G01-9-M-00018-6
1.2-10	General Arrangement Diesel Generator Building Plans and Sections	6D01-9-M-00020-8
1.2-11	General Arrangement Demineralizer Building Plan and Sections	9P07-0-M-00036-9

TABLE 1.2-1 (Continued)

GENERAL ARRANGEMENT DRAWINGS

Figure Number	Title	Reference Number
1.2-12	General Arrangement Reactor Containment Building Plan – El. (-)11'-3" Area G	6C18-9-N-05001-8
1.2-13	General Arrangement Reactor Containment Building Plan – El. (-)2'-0" Area G	6C18-9-N-05002-6
1.2-14	General Arrangement Reactor Containment Building Plan El. 19"-0" Area G	6C18-9-N-05003-7
1.2-15	General Arrangement Reactor Containment Building Plan El. 37'-3" Area G	6C18-9-N-05004-7
1.2-16	General Arrangement Reactor Containment Building Plan El. 52'-0" Area G	6C18-9-N-05005-6
1.2-17	General Arrangement Reactor Containment Building Plan El. 68'-0" Area G	6C18-9-N-05006-9
1.2-18	General Arrangement Reactor Containment Building Section "A-A" Area G	6C18-9-N-05007-6
1.2-19	General Arrangement Reactor Containment Building Section "B-B" Area G	6C18-9-N-05008-8
1.2-20	General Arrangement Reactor Containment Building Sections "C-C", "D-D", "E-E", "F-F" Area G	6C18-9-N-05009-4
1.2-21	General Arrangement Isolation Valves Cubicle Plan – E. 10'-0" Area E	6C01-9-M-00022-5
1.2-22	General Arrangement Isolation Valves Cubicle Plan El. 34'-0" Area E	6G01-9-M-00023-3
1.2-23	General Arrangement Isolation Valves Cubicle Plan El. 58'-6" Area E	6G01-9-M-00024-4
1.2-24	General Arrangement Isolation Valves Cubicle Roof Plan Area E	6G01-9-M-00025-4

TABLE 1.2-1 (Continued)

GENERAL ARRANGEMENT DRAWINGS

Figure Number	Title	Reference Number
1.2-25	General Arrangement Isolation Valves Cubicle Sections "A-A" & "B-B" Area E	6G01-9-M-00026-5
1.2-26	General Arrangement Mechanical and Electrical Auxiliary Building Plan -	
	El. 10'-0" Area H – (Sheet 1 of 4)	6M18-9-N-05015-7
	El. 10'-0" Area J – (Sheet 2 of 4)	6M18-9-N-05016-6
	El. 10'-0" Area K – (Sheet 3 of 4)	6M18-9-N-05017-10
	El. 10'-0" Area L – (Sheet 4 of 4)	6M18-9-N-05018-9
1.2-27	General Arrangement Mechanical and Electrical Auxiliary Building Plan -	
	El. 21'-0" & El. 23'-0" Area H – (Sheet 1 of 4)	6M18-9-N-05019-0
	El. 21'-0" & 23'-0" Area J – (Sheet 2 of 4)	6M18-9-N-05020-5
	El. 26'-0" & 29'-0" Area K – (Sheet 3 of 4)	6M18-9-N-05021-4
	El. 29'-0" Area L – (Sheet 4 of 4)	6M18-9-N-05022-5
1.2-28	General Arrangement Mechanical and Electrical Auxiliary Building Plan -	
	El. 35'-0" Area H – (Sheet 1 of 4)	6M18-9-N-05023-6
	El. 35'-0" Area J – (Sheet 2 of 4)	6M18-9-N-05024-6
	El. 41'-0" Area M – (Sheet 3 of 4)	6M18-9-N-05025-11
	El. 41'-0" Area L – (Sheet 4 of 4)	6M18-9-N-05026-6
1.2-29	General Arrangement Mechanical and Electrical Auxiliary Building Plan	
	El. 60'-0", El. 74'-0", & El. 76'-0" Area H – (Sheet 1 of 4)	6M18-9-N-05027-5
	El. 60'-0", 72'-0", & El. 74'-0" Area J – (Sheet 2 of 4)	6M18-9-N-05028-5
	El. 60'-0" Area K – (Sheet 3 of 4)	6M18-9-N-05029-7
	El. 60'-0" Area L – (Sheet 4 of 4)	6M18-9-N-05030-9
1.2-30	General Arrangement Mechanical and Electrical Auxiliary Building	
	Roof Plan Area H – (Sheet 1 of 4)	6M18-9-N-05031-3

TABLE 1.2-1 (Continued)

GENERAL ARRANGEMENT DRAWINGS

Figure Number	Title	Reference Number
	Roof Plan Area J – (Sheet 2 of 4)	6M18-9-N-05032-7
	Roof Plan Area K – (Sheet 3 of 4)	6M18-9-N-05033-0
	Roof Plan Area L – (Sheet 4 of 4)	6M18-9-N-05034-2
1.2-31	General Arrangement Mechanical and Electrical Auxiliary Building	
	Section “A-A” Area J – (Sheet 1 of 2)	6M18-9-N-05035-4
	Section “A-A” Area K – (Sheet 2 of 2)	6M18-9-N-05036-3
1.2-32	General Arrangement Mechanical and Electrical Auxiliary Building	
	Section “B-B” Area J – (Sheet 1 of 2)	6M18-9-N-05037-3
	Section “B-B” Area K – (Sheet 2 of 2)	6M18-9-N-05038-4
1.2-33	General Arrangement Mechanical and Electrical Auxiliary Building	
	Section “C-C” Area H – (Sheet 1 of 2)	6M18-9-N-05039-2
	Section “C-C” Area L – (Sheet 2 of 2)	6M18-9-N-05040-3
1.2-34	General Arrangement Mechanical and Electrical Auxiliary Building Section “D-D” Area H & J	6M18-9-N-05041-4
1.2-35	General Arrangement Mechanical and Electrical Auxiliary Building Section “E-E” Area H & J	6M18-9-N-05042-3
1.2-36	General Arrangement Mechanical and Electrical Auxiliary Building Section “F-F” Area K & L	6M18-9-N-05043-3
1.2-37	General Arrangement Mechanical and Electrical Auxiliary Building Section “G-G” Areas K & L	6M18-9-N-05044-5
1.2-38	General Arrangement Mechanical and Electrical Auxiliary Building Section “H-H” Areas K & L	6M18-9-N-05045-8

TABLE 1.2-1 (Continued)

GENERAL ARRANGEMENT DRAWINGS

Figure Number	Title	Reference Number
1.2-39	General Arrangement Fuel Handling Building Plan El. 4'-0" & El. (-)29'-0" Area M	6F18-9-N-05057-8
1.2-40	General Arrangement Fuel Handling Building Plan El. 21'-11" Area M	6F18-9-N-05058-9
1.2-41	General Arrangement Fuel Handling Building Plan E. 42'-6" Area M	6F18-9-N-05059-4
1.2-42	General Arrangement Fuel Handling Building Plan El. 68'-0" Area M	6F18-9-N-05060-8
1.2-43	General Arrangement Fuel Handling Building Roof El. 121'-2" Area M	6F18-9-N-05061-1
1.2-44	General Arrangement Fuel Handling Building Sections "A-A" & "F-F" Area M	6F18-9-N-05062-8
1.2-45	General Arrangement Fuel Handling Building Sections "B-B" & "E-E" Area M	6F18-9-N-05063-7
1.2-46	General Arrangement Fuel Handling Building Section "C-C" & "D-D" Area M	6F18-9-N-05064-8
1.2-47	Key General Arrangement Plan Unit 1 and Unit 2	6Y01-0-M-00003-2
1.2-48	Fuel Handling Building – Isometric	--
1.2-49	General Arrangement Essential Cooling Water Intake and Discharge Structures	6P20-0-M-00031-5
1.2-50	General Arrangement Circulating Water Intake Structure Plans and Sections	6P22-0-M-00029-7
1.2-54	General Arrangement Fire Pump House	9Q27-0-M-00037-9
1.2-55	General Arrangement Hypochlorination Facility Plans and Sections	7T23-0-M-00038-3

TABLE 1.2-1 (Continued)

GENERAL ARRANGEMENT DRAWINGS

Figure Number	Title	Reference Number
1.2-57	General Arrangement Fuel Oil and Chemical Storage Area	9V01-0-M-00033-3
1.2-58	General Arrangement Auxiliary Boilers Plan and Section (Note: Auxiliary Boilers 11 and 12 in this drawing are no longer in use)	9Q16-0-M-00034-7
1.2-59	General Arrangement Water Storage and Chemical Neutralization Facilities Plans and Sections	9Q13-0-M-00035-3
1.2-60	General Arrangement Old Steam Generator Storage Facility	9P26-0-C0168-1

1.3 COMPARISON TABLE

Table 1.3-1 and Table 1.3-2 have been removed. These tables contained historical information which is of no further use. Table 1.3-1 compared STP with other similar plants. Table 1.3-2 provided a list of significant changes in design from the description given in the PSAR. This information is available in STP FSAR Amendment 62.

1.4 IDENTIFICATION OF AGENTS AND CONTRACTORS

1.4.1 Owners

The following utilities currently own the South Texas Project Electric Generating Station (STPEGS) site, Units 1 and 2, and common station facilities:

CN-3378

- Constellation Energy Generation, LLC
- City Public Service Board of San Antonio (CPS)
- City of Austin (COA)

1.4.2 Applicant

The applicant was Houston Lighting & Power Company (HL&P), acting for itself and for CPS, COA, and Central Power and Light Company (CPL) pursuant to the South Texas Project Electric Generating System Participation Agreement between the four companies. HL&P was acting as project manager for the owners, responsible for the design, construction, and operation of STPEGS, Units 1 and 2.

HL&P had the responsibility of securing and maintaining the operating licenses for the two units. HL&P has been involved in a limited amount of the design for the two units, has reviewed the plant design, and had the initial overall responsibility of STPEGS.

On November 17, 1997 responsibility for the operation of the South Texas Project was transferred from HL&P to the STP Nuclear Operating Company (STPNOC). STPNOC is a Texas non-profit corporation created, controlled and financed by the owners specifically for the purpose of operating STPEGS. This change was incorporated in the Unit 1 and Unit 2 Licenses via Amendments 93 and 80, respectively.

On August 31, 2002, HL&P (Reliant Energy) transferred its ownership interest in STPEGS and in STPNOC to Texas Genco, LP. This change was incorporated in the Unit 1 and Unit 2 Operating Licenses via Amendments 142 and 130, respectively.

On January 12, 2006, the NRC approved the transfer of ownership interest in STPEGS and in STP Nuclear Operating Company from Texas Genco, LP to NRG South Texas LP. This change was incorporated in the Unit 1 and Unit 2 Operating Licenses via Amendments 178 and 165, respectively.

American Electric Power Company, Inc. (AEP) is the parent company of CPL. Effective December 23, 2002, AEP sold the retail company portion of CPL to Centrica, and transferred the Central Power and Light/CPL names to Centrica as well. AEP renamed the remaining portions of CPL (generation and distribution interests) as “AEP Texas Central Company” (TCC).). TCC sold its STP ownership interest to CPS and Texas Genco, LP on May 19, 2005.

AEP Texas Central Company sold its ownership interest in STPEGS to Texas Genco, LP and CPS. License Amendments 172/160 became effective on May 19, 2005. Texas Genco, LP sold its STP ownership interest to NRG South Texas LP. License Amendments 178 and 165 became effective on June 29, 2007.

NRG South Texas LP sold its STP ownership interest to Constellation Energy Generation, LLC. License Amendments 226 and 211 became effective on November 1, 2023. CN-3378

1.4.3 Engineer/Construction Manager and Constructor

Initially, Brown and Root (B&R) was the Engineer/Constructor responsible for the design, engineering, procurement, and construction of STPEGS. This included all plant structures, systems and components other than those provided by the NSSS supplier.

B&R utilized the services of NUS Corporation and EDS Nuclear, Inc. for specialized engineering and consulting services.

In September 1981, HL&P requested Bechtel Energy Corporation (BEC) to prepare to assume the responsibility for design, engineering, procurement, and construction management.

The transfer process included a detailed in-depth evaluation by BEC of past work to evaluate the status of STPEGS with regard to applicable regulatory requirements. Any required changes or updating of STPEGS to meet regulatory requirements identified during the transfer of responsibilities were performed by BEC.

After the transfer of responsibilities had been completed, BEC assumed responsibility for the STPEGS design and engineering performed by B&R. Under the purview of BEC as Construction Manager, construction work was performed by Ebasco Services, Inc. and other qualified contractors as required.

1.4.4 Nuclear Steam Supply System Supplier

Westinghouse Electric Corporation is the Nuclear Steam Supply System (NSSS) supplier for STPEGS, Units 1 and 2.

1.4.5 Consultants

1.4.5.1 NUS Corporation. NUS has assisted HL&P in evaluating the potential impact that construction and operation of the nuclear facility has had on the environment. It has provided environmental consulting services in select areas and consulting for Containment analyses.

1.4.5.2 Woodward-Clyde Consultants. Woodward Clyde Consultants has provided assistance in the determination of seismic and geologic characteristics of the site and the region surrounding the site.

1.4.5.3 Southwest Research Institute. Southwest Research Institute has assisted HL&P in the areas of quality assurance, preservice inspection, and inservice inspection.

1.4.5.4 Dames & Moore. Dames & Moore has provided consulting services regarding the Reservoir Relief Well System and land use.

1.4.5.5 Impell. Impell has provided assistance in the area of fire hazards and operations support.

1.4.5.6 Stone & Webster. Stone & Webster has provided consulting services regarding the Engineering Assurance Program (EAP).

1.4.5.7 McClelland Consultants (Southwest), Inc. McClelland Consultants (Southwest) has provided consulting services for the underseepage control system for the Main Cooling Reservoir (MCR).

1.4.5.8 Harza Engineering Company (Harza). Harza has provided engineering and consulting services regarding the stability of the MCR embankment.

1.4.5.9 Mantech Advanced Systems International, Inc. Mantech has provided consulting on the Qualified Display Processing System (QDPS) verification and validation program.

1.4.5.10 Babcock and Wilcox (B&W). B&W has provided consulting, engineering and NDE services in the area of preservice inspection.

1.4.5.11 Gilbert/Commonwealth, Inc. (GCI). GCI has provided consulting services on preservice and inservice inspections.

1.4.5.12 Harding Lawson Associates (HLA). HLA provided the post-Construction Permit (CP) phase independent review of the seismic reflection data.

1.4.5.13 Westinghouse Electric Corporation. Westinghouse provided a fuel rack criticality analysis, and provides NSSS and Balance-of Plant consulting services.

1.4.5.14 Lumbermen's Mutual Casualty Company (LMCC). LMCC provides American Society of Mechanical Engineers (ASME) III Inspection consulting services.

1.4.5.15 PLG, Inc. (PLG). PLG provides Plant Risk Model Development consulting services.

1.4.5.16 Hurst Engineering, Inc. Hurst provides engineering support for station blackout validations and improved technical specifications.

1.4.5.17 Sargent & Lundy LLP (S&L). S&L provides consulting services for engineering support.

1.4.5.18 ERIN Engineering & Research, Inc. (ERIN). ERIN provides plant risk assessment model development services.

1.4.6 Operations Support Contractors

1.4.6.1 Bechtel Energy Corporation (BEC). BEC provided operations engineering and licensing support.

1.4.6.2 D. L. Carroll Constructors (DLC). DLC provided facility modification and construction services.

1.4.6.3 Chem-Nuclear Systems, Inc. (CNSI). Chem-Nuclear Systems, Inc. may provide Low Level Radioactive Waste dewatering, solidification, and transportation services. In addition, Low Level Radioactive Waste burial services may be provided.

1.4.6.4 Ebasco Constructors, Inc. (ECI). ECI provided operations support construction services.

1.4.6.5 Raytheon Engineers and Constructors. Raytheon provided operations support, maintenance and construction services.

1.4.6.6 The Wackenhut Corporation. Wackenhut provided Site Security Services. In addition, unescorted access background investigations services were provided.

1.4.6.7 Regulated Security Solutions (RSS). RSS provides Site Security Services.

1.4.6.8 Baley, Hinchy, Downs. Baley, Hinchy Downs provides unescorted access background investigation services.

1.4.6.9 GCA Services Group (GCA) . GCA provides janitorial services. In addition, grounds maintenance for the site and main cooling reservoir levee are provided.

1.4.6.10 Scientific Ecology Group (SEG). SEG provides Low-Level Radwaste Processing (volume reduction) services. In addition, transportation of processed "dry active waste" (DAW) to CNSI for disposal/burial services.

1.4.6.11 Westinghouse Electric Corporation. Westinghouse provides operational and outage support contracted services.

1.4.6.12 Framatome Technologies, Inc. (FTI). FTI provides steam generator engineering analysis and steam generator outage services.

1.5 REQUIREMENTS FOR FURTHER TECHNICAL INFORMATION

Reference 1.5-1 presents descriptions of the safety-related research and development programs which are being carried out for, by, or in conjunction with Westinghouse Nuclear Energy Systems, and which are applicable to Westinghouse Electric Corporation (Westinghouse) pressurized water reactors (PWRs).

For each program still in progress, the safety-related program is first introduced and then is followed, where appropriate, by background information. There is, then, a description of the program that relates program objectives to the problem and presents pertinent recent results. Finally, a backup position may be given for programs – generally experimental rather than analytical – which have not yet reached a stage where it is reasonably certain that the results confirm the expectation. The backup position is one that might be used if the results are unfavorable; it is not necessarily the only course that might be taken.

The term "research and development", as used in the report, is the same as that used by the Nuclear Regulatory Commission (NRC) in Section 50.2 of its regulations, that is:

> (n) 'Research and development' means (1) theoretical analysis, exploration or experimentation; or (2) the extension of investigative findings and theories of a scientific nature into practical application for experimental and demonstration purposes including the experimental production and testing of models, devices, equipment, materials, and processes.

The technical information generated by these research and development programs will be used to demonstrate the safety of the design and more sharply define margins of conservatism or will lead to design improvements.

1.5.1 Verification Tests (17 x 17 XLR Fuel Assembly)

A comprehensive description of the 17 x 17 XLR Fuel Assembly is given in Section 4.2.

1.5.1.1 Rod Cluster Control Spider Tests. An evaluation of previously available test data was conducted to verify the fatigue life of the rod cluster control assembly (RCCA) spider in South Texas Units 1 and 2. This review of RCCA testing completed to date showed that further testing is not required to verify the South Texas spider design. The spider loads in the test data bound the expected loads in South Texas.

1.5.1.2 Grid Tests. The grid design of the XLR Fuel Assembly is similar to the 17 x 17 fuel assembly grid design. Verification tests of the structural adequacy of this grid design have been completed. Refer to Section 4.2 and Reference 1.5-2 for a discussion of these tests.

1.5.1.3 Fuel Assembly Structural Tests. The 17 x 17 XLR fuel assembly has been tested for mechanical strength, including internal damping, lateral and axial stiffness, and lateral and axial impact responses for both static and dynamic loading. These tests confirm the structural integrity of the design.

1.5.1.4 Prototype Assembly Tests. The purpose of these tests was to demonstrate that the 17 x 17 XLR fuel assembly design will perform as predicted. The tests, which included flow and system conditions covering those most likely to occur in a plant during normal operation, verified the adequacy of the design.

1.5.1.5 Guide Tube Tests. Verification tests of the structural adequacy of the guide tubes have been completed, and reported in WCAP-9596 (Ref. 1.5-7).

1.5.1.6 Single Rod Burst Test. Previously, single-rod burst tests (SRBTs) and multi-rod burst tests (MRBTs) were performed on 15 x 15 fuel assembly rods under conditions conservatively calculated to exist during a loss-of-coolant-accident (LOCA). The conclusions drawn from these tests were that fuel rods burst in a staggered manner to produce assembly average blockage at the peak axial location of 47 percent or less.

Subsequently, the NRC determined that fuel rod burst and fuel assembly blockage should be predicted using models contained in NUREG-0630. These models have been incorporated into the Westinghouse Emergency Core Cooling System (ECCS) Evaluation Model (featuring BASH) used herein (Ref. 1.5-9).

1.5.2 Lower Internals 1/7 Scale Model Internals Test

Test Purpose and Parameters

In this series of tests, a 1/7-scale model of the 17 x 17 XLR internals will be employed to determine the vibration and flow forces on the internals. Flow distribution through the lower core support plate to the fuel assemblies will be verified, and the flow velocities at other areas within the vessel will be measured.

Facility

These tests were conducted in the Westinghouse Test Engineering Laboratory H-Loop.

Status

The 17 x 17 XLR internals 1/7 scale model test is completed and is reported in WCAP-9395 (proprietary) (Ref. 1.5-5).

1.5.3 Lower Internals Vibration Tests

Test Purpose and Parameters

See Section 3.9.2.3 and WCAP-10865 (Ref. 1.5-8).

1.5.4 LOCA Heat Transfer (17 x 17 XLR)

Extensive experimental programs have been performed with a simulated 17 x 17 assembly to determine its behavior under LOCA conditions. The 17 x 17 tests were conducted in the G-2 Loop Facility at the Westinghouse Forest Hills Laboratory.

Results from the 17 x 17 programs were used together with data from 15 x 15 assembly test programs to validate the BART computer code (Ref. 1.5-4) models for predicting LOCA heat transfer.

1.5.5 Rapid Refueling Hardware Tests

Selected tests have been conducted on components specifically designed for the Rapid Refueling System. These selected tests are limited to components which have a direct impact on safety. These tests are considered confirmatory (Ref. 1.5-6).

1.5.6 Prototype Roto-Lok Closure System Test

Test Purpose and Parameters

A full-size prototype roto-lok stud, vessel insert, closure nut, spherical washer, and associated hardware were tested to verify the design. Static loads were placed on this closure system to obtain shank, lug, and fillet stress. These stresses were compared to the analytical numbers obtained in the design to verify that proper assumptions were made for obtaining reactor vessel and stud sizes. Fatigue tests were conducted to obtain stresses under simulated conditions of heatup, cool-down, and vessel opening and closing.

Facility

These tests were conducted in a special test area set up at the Westinghouse Forest Hills test site. Following the completion of the test, the facilities were dismantled for storage.

Status

The full-size prototype roto-lok closure tests were conducted and documented in WCAP-8447 (Ref. 1.5-6).

1.5.7 Prototype Control Rod Drive Mechanism with Rod Holdout Device System Test

Test Purpose and Parameters

A magnetic jack mechanism with the rod holdout device will be tested to verify the safety and reliability of this system for holding rods withdrawn during refueling operations and for preventing this system from activating during power operation. Cyclic tests were performed to determine wear rates and characteristics. Static load tests were performed to determine load-carrying capabilities of the system.

Facility

These tests on t he Rod Holdout System were performed in the control rod drive mechanism (CRDM) test facilities located at EMD, Cheswick, Pennsylvania, and in the D Loop Facility at the Westinghouse Forest Hills Laboratory.

Status

The CRDM rod holdout device test was completed in May 1978. Results of the test were satisfactory and documented in WCAP-9596 (Ref. 1.5-7). These tests are considered confirmatory.

1.5.8 Westinghouse Test Engineering Laboratory Facility

The Test Engineering Laboratory at Forest Hills, Pennsylvania, has long been the major Westinghouse center for nuclear research and development. The Test Engineering Laboratory is totally involved with the design and implementation of facilities and programs to prove the reliability of Westinghouse PWR concepts and components.

The Test Engineering Laboratory has full in-house capabilities to design and construct PWR loops for both hydraulic and heat transfer programs.

Five general purpose hydraulic loops are also involved in the development of improved water reactor components, as well as the reliability testing of current and prototype PWR components. The Test Engineering Laboratory is a very flexible installation, one which will continue to expand and develop as future needs for its services arise. Its staff varies according to requirements. The Test Engineering Laboratory has the option of obtaining personnel from the entire corporation, depending upon the need for specific skills, knowledge, and experience.

References

Section 1.5:

1.5-1 "Safety Related Research and Development for Westinghouse Pressurized Water Reactors, Program Summaries", Winter 1977, Summer 1978, WCAP-8768, Revision 2.

1.5-2 Gesinski, L., D. Chiang, and S. Nakazato, "Safety Analysis of the 17 x 17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident", WCAP-8288 (December 1973).

1.5-3 Reference not used.

1.5-4 Young, M.Y. et.al., "BART-Al: A computer code for the Best Estimate Analysis of Reflood Transients", WCAP-9561-P-A-Proprietary (March 1984).

1.5-5 Shockling, L.A. "4XL 17 Scale Model Internal Flow Test Structural Response Report", WCAP-9395 (Proprietary) February 1979.

1.5-6 "Roto-Lok Closure System Development", WCAP-8447 (Proprietary) and WCAP-8448 (Nonproprietory), December 1974.

1.5-7 "17 x 17 XLR D-LOOP-Evaluation with 9 Grid Standard XL Fuel Assembly, 10 Grid Special Test XL Fuel Assembly, 10 Grid Optimized XL Fuel Assembly Heavy Drive Rod B4C Hybrid Rod Control Cluster Control Assembly", WCAP-9596, December 1979.

1.5-8 "South Texas Plant (TGX) Reactor Internals Flow-Induced Vibration Assessment", WCAP-10865 (Proprietary) and WCAP-10866 (Nonproprietary), June 1985.

1.5-9 Young, M.Y. et. al., "The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code," WCAP-10266-P-A Rev. 2, (Proprietary), 1981.

1.6 MATERIAL INCORPORATED BY REFERENCE

The South Texas Project Electric Generating Station (STPEGS) Updated Final Safety Analysis Report (UFSAR) incorporates, by reference, various topical reports as part of the applications. Non-Westinghouse reports are listed in Table 1.6-1 and Westinghouse topical reports are listed in Table 1.6-2. The Westinghouse referenced topical reports have been filed separately in support of this and similar applications.

TABLE 1.6-1

NON-WESTINGHOUSE REPORTS INCORPORATED BY REFERENCE

REPORT	TITLE	UFSAR REFERENCE
NUREG 0004	RELAP 3B-MOD 101, A Reactor System Transient Code (January 1976)	6.2.1.2
NUREG 0017	Calculations of Releases of Radioactive Materials in Gaseous and Liquid Effluents for Pressurized Water Reactors (April 1976)	11.1; 11.1.2; 11.2.2.4
NUREG 0085	The Analysis of Fuel Densification (July 1976)	4.3
NUREG 0138	Staff Discussion of 15 Technical Issues Listed in Attachment to November 3, 1976 Memo from Director NRR to NRR Staff (November 1976)	Q022.4
NUREG 0143	The Correlation of Peak Ground Acceleration Amplitude with Seismic Intensity and Other Physical Parameters (1977)	2.5.2
NUREG 0291	An Evaluation of PWR Steam Generator Water Hammer; Final Report, June 1, 1976 – December 31, 1976 (June 1977)	10.4.7.3 (ref. 10.4-2)
NUREG 0570	Toxic Vapor Concentrations in the Control Room Following a Postulated Accidental Release (1979)	Q312.26; 2.2.3.1
NUREG 0630 (Draft)	Cladding Swelling and Rupture Models for LOCA Analysis (April 1980)	Q440.3

TABLE 1.6-1 (Continued)

NON-WESTINGHOUSE REPORTS INCORPORATED BY REFERENCE

REPORT	TITLE	UFSAR REFERENCE
NUREG 0654	Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants, Rev. 1 (November 1980)	7A.S.8.4.3
NUREG 0660	NRC Action Plan Developed As A Result of the TMI-2 Accident (May 1980)	7A.S.8.4.3
NUREG 0696	Functional Criteria for Emergency Response Facilities (February 1981)	7A.S.8.4.3
NUREG 0731	Guidelines for Utility Management Structure and Technical Resources Draft Report for Interim Use and Comment (September 1980)	7A.S.8.4.3
NUREG 0737	Clarification on TMI Action Plan Requirements (November 1980)	7A.S.8.4.3
NUREG 0814	Methodology for Evaluation of Emergency Response Facilities – Draft Report for Comment (August 1981)	7A.S.8.4.3
NUREG 0818	Emergency Action Levels for LWRs (August 1981)	7A.S.8.4.3
NUREG 75/014	Reactor Safety Study: An Assessment of Risks in U.S. Commercial Nuclear Power Plants (December 1975)	15.6
NUREG-CR 1577	An Approach to Seismic Zonation for Siting Nuclear Electric Power Generating Facilities in the Eastern United States (May 1981)	2.5.2

TABLE 1.6-1 (Continued)

NON-WESTINGHOUSE REPORTS INCORPORATED BY REFERENCE

REPORT	TITLE	UFSAR REFERENCE
NUREG/CR 1741	Models for Estimation of Incapacitation Times Following Exposure to Toxic Gases or Vapors (December 1980)	2.2.3
NUREG/CR-5009	Assessment of Extended Burnup Fuel in Light Power Reactors (February 1988)	11.1.6 12.2.3 15.A.4
BN-TOP-2	Design for Pipe Break Effects, Rev. 2 (May 1974)	3.6
BN-TOP-4	Subcompartment Pressure Analysis, Rev. 1 (October 1977)	3.6
NUREG-CR 0200	KENO Va – An Improved Monte Carlo Criticality Program with Supergrouping	4.3
NUREG-CR 2306	CSRL-V: Processed ENDF/B-V 227 Neutron Group and Pointwise Cross Section Libraries for Criticality Safety, Reactor Shielding Studies	4.3
BNWL-B-82	COBRA-III, a Digital Computer Program for Steady State and Transient Thermal-Hydraulic Analysis of Rod Bundle Nuclear Fuel Elements	4.4
BNWL-371	Crossflow Mixing Between Parallel Flow Channels During Boiling, Part III Effects of Spacers on Mixing Between Two Channels	4.4

TABLE 1.6-2

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-2048	The Doppler Effect for a Non-Uniform Temperature Distribution in Reactor Fuel Elements	7/62	Rev 0	4.3	0
WCAP-2850-L(P) WCAP-7916	Single-Phase Local Boiling and Bulk Boiling Pressure Drop Correlations	1/66, 6/72	Rev 0	4.4	0
WCAP-2923	In-Pile Measurement of UO_2 Thermal Conductivity	3/66	Rev 0	4.4	0
WCAP-3269-8	Hydraulic Tests of the San Onofre Reactor Model	6/64	Rev 0	4.4	0
WCAP-3269-26	LEOPARD – A Spectrum Dependent Non-Spatial Depletion Code for the IBM – 7094	6/64	Rev 0	4.3, 15.0 15.4	0
WCAP-3385-56	Saxton Core II Fuel Performance Evaluation	7/70	Rev 0	4.4	0
	WCAP-3385-56, Part II Evaluation of Mass Spectrometric and Radiological Materials Saxton Plutonium Fuel				
WCAP-3680-20	Xenon-Induced Spatial Instabilities in Large Pressurized Water Reactors (EURAEC-1974)	3/68	Rev 0	4.3	0

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-3680-21	Control Procedures for Xenon-Induced X-Y Instabilities in Large Pressurized Water Reactors (EURAEC-2111)	2/69	Rev 0	4.3	0
WCAP-3680-22	Xenon-Induced Spatial Instabilities in Three Dimensions (EURAEC-2116)	9/69	Rev 0	4.3	0
WCAP-3696-8	Pressurized Water Reactor pH Reactivity Effect Final Report (EURAEC-2074)	10/68	Rev 0	4.3	0
WCAP-3726-1	PUO_2-UO_2 Fueled Critical Experiments	7/67	Rev 0	4.3	
WCAP-6065	Melting Point of Irradiated UO_2	2/65	Rev 0	4.2, 4.4	0
WCAP-6069	Burnup Physics of Heterogeneous Reactor Lattices	6/65	Rev0	4.4	0
WCAP-6073	LASER – Depletion Program for Lattice Calculations Based on MUFT and THERMOS	4/66	Rev 0	4.3	0
WCAP-6086	Supplementary Report on Evaluation of Mass Spectrometric and Radiochemical Analyses of Yankee Core I Spent Fuel. Including Isotopes of Elements Thorium through Curium	8/69	Rev 0	4.3	0

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-7015	Subchannel Thermal Analysis of Rod Bundle Cores	1/69	Rev 1	4.4	0
WCAP-7048-P-A(P) WCAP-7757-A	PANDA Code	1/75	Rev 0	4.3	A
WCAP-7208 WCAP-7811	Power Distribution Control of Westinghouse Pressurized Water Reactors	12/71		4.3	0
WCAP-7213-P-A(P) WCAP-7758-A	TURTLE 24.0 Diffusion Depletion Code	1/75	Rev 0	4.3	A
WCAP-7263 (P) WCAP-7750	A Comprehensive Space-Time Dependent Analysis of Loss of Coolant (SATAN-IV Digital Code)	8/71		3.6	0
WCAP-7267-L (P) WCAP-7809	Core Power Capability in Westinghouse PWRs	12/71		4.3	0
WCAP-7306	Reactor Protection System Diversity in Westinghouse Pressurized Water Reactors	4/69		15.3, 15.4	B
WCAP-7308-L(P) WCAP-7810	Evaluation of Nuclear Hot Channel Factor Uncertainties	12/71	Rev o	4.3	U
WCAP-7359-L(P) WCAP-7838	Application of THINC Program to PWR Design	1/72	Rev 0	4.4	0

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TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-7397-L(P) WCAP-7817	Seismic Testing of Electrical and Control Equipment	2/70, 12/71	Rev 0	3.10N	U
WCAP-7397-L(P) WCAP-7817	Seismic Testing of Electrical and Control Equipment (WCID Process Control Equipment)	1/71 12/71	Supplement 1, 2, 3, 4, 5, 6	3.10N	B
WCAP-7488-L(P) WCAP-7672	Solid State Logic Protection System Description	3/71, 5/71	Rev 0	7.1, 7.2, 7.3	A
WCAP-7536-L(P) WCAP-7821	Seismic Testing of Electrical and Control Equipment (High Seismic Plants)	11/70	Rev 0	3.10N	U
WCAP-7558	Seismic Vibration Testing with Sine Beats	9/72	Rev 0	3.10	U
WCAP-7588	Evaluation of Rod Ejection Accident In Westinghouse Pressurized Water Reactors Using Spatial Kinetics Methods	1/75	Rev 1A	15.4	A
WCAP-7623	Dynamic Fracture Toughness Properties of Heavy Section A533 Grade B Class 1 Steel Plate	12/70		5.4	U
WCAP-7667-P-A(P) WCAP-7755-A	Interchannel Thermal Mixing with Mixing Vane Grids	1/75	Rev 0	4.4	A
WCAP-7695-P-A(P)	DNB Test Results for New Mixing Vane Grids (R)	1/75	Rev 0	4.4	A

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-7695-Addendum 1-P-A WCAP-7958-Addendum 1-A	DNB Test Results for R Grid Thimble Cold Wall Cells	1/75		4.4	A
WCAP-7705	Testing of Engineered Safety Features Actuation System	5/76	Rev 2	7.3	B
WCAP-7706-L (P) WCAP-7706	An Evaluation of Solid State Logic Reactor Protection in Anticipated Transients	9/71	Rev 0	4.6, 7.1, 7.2	U
WCAP-7735 WCAP-7477-L	Sensitized Stainless Steel in Westinghouse PWR Nuclear Steam Supply Systems	8/71		5.2	A
WCAP-7769	Overpressure Protection for Westinghouse Pressurized Water Reactors	6/72	Rev 1	5.2, 15.2	U
WCAP-7832	Evaluation of Steam Generator Tube, Tube Sheet, and Divider Plate Under Combined LOCA Plus SSE Conditions	12/73	Rev 0	5.4	A
WCAP-7870	Neutron Shielding Pads	7/72	Rev 0	3.9	A
WCAP-7879	Four Loop PWR Internals Assurance and Test Program	7/72		3.9	A

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-7907	LOFTRAN Code Description	10/72	REV 0	5.2, 15.0, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6	U
WCAP-7908	FACTRAN – A FORTRAN-IV Code for Thermal Transients in a UO_2 Fuel Rod	9/72	Rev 0	15.0, 15.3, 15.4	U
WCAP-7909	Marvel-A Digital Computer Code for Transient Analysis of a Multiloop PWR System	3/73		6.2	U
WCAP-7912-P-A(P) WCAP-7912-A	Power Peaking Factors	1/74	Rev 0	4.3, 4.4	A
WCAP-7913	Process Instrumentation for Westinghouse Nuclear Steam Supply Systems (Four-Loop Plant Using WCID-7300 Series Process Instrumentation)	3./73	Rev 0	7.2, 7.3	B
WCAP-7921-AR	Damping Values of Nuclear Power Plant Components	5/74	Rev 0	3.7	A
WCAP-7941-P-A(P) WCAP-7959-A	Effect of Axial Spacing on Interchannel Thermal Mixing with the R Mixing Vane Grid	1/75	Rev 0	4.4	A
WCAP-7950	Fuel Assembly Safety Analysis for Combined Seismic and Loss of Coolant Accident	7/72		3.7	U

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	UFSAR Section Reference	Review [b] Status
WCAP-7956	THINC-IV-An Improved Program for Thermal-Hydraulic Analysis of Rod Bundle Cores	6/73	Rev 0	4.4	A
WCAP-7964	Axial Xenon Transient Tests at Rochester Gas and Electric Reactor	6/71	Rev 0	4.3	0
WCAP-7979-P-A(P) WCAP-8028-A	TWINKLE – A Multidimensional Neutron Kinetics Computer Code	1/73	Rev 0	15.0, 15.4	A
WCAP-8054(P) WCAP-8195	Application of THINC-IV Program to PWR Design	10/73	Rev 0	4.4	A
WCAP-8082-P-A(P) WCAP-8172-A	Pipe Breaks for the LOCA Analysis of Westinghouse Primary Coolant Loop	1/75	Rev 0	3.6	A
WCAP-8163	Reactor Coolant Pump Integrity in LOCA	9/73	Rev 0	5.4	U
WCAP-8170(P) WCAP-8171	Calculational Model for Core Reflooding After a Loss-of-Coolant Accident (WREFLOOD Code)	6/74	Rev 0	15.6	AE
WCAP-8183	Operational Experience with Westinghouse Cores	Many submittals, latest version	Latest	11.1	B

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	UFSAR Section Reference	Review [b] Status
WCAP-8218-P-A(P) WCAP-8219-A	Fuel Densification Experimental Results and Model for Reactor Application	3/75	Rev 0	4.1, 4.2, 4.3	A
WCAP-8236 (P) WCAP-8288	Safety Analysis of 17 x 17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident	12/73	Rev 0	1.5, 4.2, 3.7	A
WCAP-8236 (P) WCAP-8288	Safety Analysis of Eight-Grid 17 x 17 Fuel Assembly for Combined Seismic and Loss-of-Coolant Accident	4/74	Addendum 1	3.7, 1.5	A
WCAP-8252	Documentation of Selected Westinghouse Structural Analysis Computer Codes	7/77	Rev 1	3.6, 3.9	U
WCAP-8253	Source Term Data for Westinghouse Pressurized Water Reactors	6/74	Amendment 1	11.1	B
WCAP-8255	Nuclear Instrumentation System	4/74	Rev 0	7.2, 7.3	B
WCAP-8258	Spraco Model 1713A Nozzle Spray Drop Size Distribution	5/75	Rev 1	6.5	B
WCAP-8264-P-A (P) WCAP-8312-A	Westinghouse Mass and Energy Release Data for Containment Design	4/74	Rev 1	6.2	A
WCAP-8278 (P) WCAP-8279	Hydraulic Flow Test of 17 x 17 Fuel Assembly	2/74	Rev 0	4.2. 4.4	U

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-8298-P-A(P) WCAP-8299-A	The Effect of 17 x 17 Fuel Assembly Geometry on Interchannel Thermal Mixing	12/74	Rev 0	4.4	A
WCA-8301 (P) WCAP-8305	LOCA-IV Program: Loss-of-Coolant Transient Analysis	6/74	Rev 0	15.0, 15.6	AE
WCAP-8302 (P) WCAP-8306	SATAN-IV Program: Comprehensive Space-Time Dependent Analysis of Loss-of-Coolant	6/74	Rev 0	15.0	AE
WCAP-8303-P-A(P) WCAP-8317-A	Prediction of the Flow Induced Vibration of Reactor Internals by Scale Model Tests	7/75	Rev 0	3.9	A
WCAP-8324-A	Control of Delta Ferrite in Austenitic Stainless Steel Weldments	6/74	Rev 0	5.2	A
WCAP-8327 (P) WCAP-8326	Containment Pressure Analysis Code (COCO)	7/74	Rev 0	15.6	AE
WCAP-8330	Westinghouse Anticipated Transients Without Trip Analysis	8/74	Rev 0	4.3, 4.6, 15.1, 15.2, 15.4, 15.8	U
WCAP-8339	Westinghouse Emergency Core Cooling System Evaluation Model - Summary	7/74	Rev 0	15.6	AE
WCAP-8340 (P) WCAP-8356	Westinghouse Emergency Core Cooling System-Plant Sensitivity Studies	8/74	Rev 0	15.6	AE

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-8341 (P) WCAP-8342	Westinghouse Emergency Core Cooling System Evaluation Model-Sensitivity Studies	7/74	Rev 0	15.6	AE
WCAP-8359	Effects of Fuel Densification Power Spikes of Clad Thermal Transients	7/74	Rev 0	4.3	AE
WCAP-8370	Westinghouse Water Reactor Divisions Quality Assurance Plan	10/79	Rev 9A	3.11N, 7.2, 15.0	A
WCAP-8373	Qualification of Westinghouse Seismic Testing Procedure for Electrical Equipment Tested Prior to May 1984	8/74		3.10N	B
WCAP-8376	Iodine Removal by Spray in the Joseph M. Farley Station Containment	7/74	Rev 0	6.5	B
WCAP-8377 (P) WCAP-8381	Revised Clad Flattening Model	7/74	Rev 0	4.2	A
WCAP-8385 (P) WCAP-8403	Power Distribution Control and Load Following Procedures	9/74	Rev 0	4.3, 4.4	A
WCAP-8424	Evaluation of Loss of Flow Accidents Caused by Power System Frequency Transients in Westinghouse PWRS	6/75	Rev 1	15.2	U
WCAP-8440	Anticipated Transient Without Trip Analysis for a Four-Loop (3817 MWt) Westinghouse PWR	11/74		4.3	U

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-8446 (P) WCAP-8449	17 X 17 Drive Line Components Tests Phase IB, II, III, D-Loop Drop, and Deflection	12/74	Rev 0	3.9	A
WCAP-8447 (P) WCAP-8448	Roto-Lok Closure System Development	12/74		1.5, 5.3	U
WCAP-8453 (P) WCAP-8454	Analysis of Data from the Zion (Unit 1) THINC Verification Test	12/74	Rev 0	4.4	A
WCAP-8471 (P) WCAP-8472	Westinghouse ECCS Evaluation Model – Supplementary Information	4/74	Rev 0	15.6	AE
WCAP-8498	Incore Power Distribution Determination in Westinghouse Pressurized Water Reactors, Program Summaries – Fall 1974	7/75	Rev 0	4.3	U
WCAP-8510	Method for Fracture Mechanics Analysis of Nuclear Reactor Vessels Under Severe Thermal Transients	7/76	Rev 0	3.9	U
WCAP-8516-P (P) WCAP-8517	UHI Plant Internals Vibration Measurement Program and Pre and Post Hot Functional Examinations	3/75	Rev 0	3.9	A
WCAP-8536 (P) WCAP-8537	Critical Heat Flux Testing of 17 x 17 Fuel Assembly Geometry with 22-in. Grid Spacing	5/75	Rev 0	4.4	A
WCAP-8577	Application of Preheat Temperature after Welding Pressure Vessel Steels	2/76	Rev 0	5.2	A

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-8584 (P) WCAP-8760	Failure Mode and Effects Analysis (FMEA) of Engineered Safeguard Features Actuation System	4/76, 2/80	Rev 0 Rev 1	4.6, 7.3	U
WCAP-8587	Equipment Qualification Data Packages	4/78	Supp 1 Supp 2	3.10N, 3.11N	U
WCAP-8587	Methodology for Qualifying Westinghouse WRD Supplied NSSS Safety-Related Electrical Equipment	1983	Rev 5 Rev 6	3.10N, 3.11N	U
WCAP-8622 (P) WCAP-8623	Westinghouse ECCS Evaluation Model – October 1975 Version	10/75	Rev 0	15.6	AE
WCAP-8624 (P) WCAP-8695	General Method of Developing Multi-Frequency – Biaxial Text Inputs for Bistables	9/75	Rev 0	3.10N	U
WCAP-8682 (P) WCAP-8683	Experimental Verification of Wet Fuel Storage Criticality Analyses	3/76	Rev 0	4.3	B
WCAP-8691 (P) WCAP-8692	Fuel Rod Bowing	12/75	Rev 0	4.2, 4.4	U
WCAP-8693	Delta Ferrite in Production Austenitic Stainless Steel Weldments	1/76	Rev 0	5.2	B
WCAP-8708-P-A (P), Volumes I and II WCAP-8709-A, Volumes I and II	MULTIFLEX – FORTRAN-IV Computer Program for Analyzing Thermal-Hydraulic Structure System Dynamics	2/76	Rev 0	3.6, 3.7	A

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	FSAR Revision Number	FSAR Section Reference	Review [b] Status
WCAP-8720 (P) WCAP-8785	Improved Analytical Models Used in Westinghouse Fuel Rod Design Computations	10/76	Rev 0	4.2	A
WCAP-8762-P-A (P) WCAP-8763	New Westinghouse Correlation WRB-1 for Predicting Critical Heat Flux in Rod Bundles with Mixing Vane Grids	9/78	Rev 0	4.4	A
WCAP-8768	Safety-Related Research and Development for Westinghouse Pressurized Water Reactors, Program Summaries – Winter 1977 – Summer 1978	7/76	Rev 2 Rev 1	1.5, 4.2, 4.3	B
WCAP-8766 (P) WCAP-8780	Verification of Neutron Pad and 17 x 17 Guide Tube Designs by Preoperational Tests on the Trojan 1 Power Plant	5/76	Rev 0	3.9	A
WCAP-8872	Design, Inspection, Operation and Maintenance Aspects of the W NSSS to Maintain Occupational Exposures as Low as Reasonably Achievable	4/77		12.4	B
WCAP-8892-A	Westinghouse 7300 Series Process Control System Noise Tests	4/75	Rev 0	7.1	A
WCAP-8929	Benchmark Problem Solution Employed for Verification of WECAN Computer Program	5/77	Rev 0	3.9	U
WCAP-8970 (P)	Westinghouse Emergency Core Cooling System Small Break October 1975 Model	10/75		15.6	U

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-8976	Failure Mode and Effects Analysis (FMEA) of Solid State Full-Length Rod Control System	9/77	Rev 0	4.6, 7.7	U
WCAP-9000L (P) WCAP-7806	Nuclear Design of Westinghouse Pressurized Water Reactors with Burnable Poison Rods	12/71	Rev 1	4.3	B
WCAP-9004 (P) WCAP-7836	Inlet Orificing of Open PWR Cores	1/72		4.4	B
WCAP-9179 (P) WCAP-9224	Properties of Fuel and Core Component Materials	10/77	Rev 1	4.2	U
WCAP-9226 WCAP-9227	Reactor Core Response to Excessive Secondary Steam Releases	9/78	Rev 1	15.1	U
WCAP-9292	Dynamic Fracture Toughness of ASME SA508 Class 2a, ASME SA533 Grade A Class 2 Base, Heat Affected Zone Material, and Applicable Weld Metals	3/78	Rev 0	5.2	U
WCAP-9364	High Pressure Water Hammer Test Program for the Counter-flow Preheat Steam Generator	11/82, 4/83, 6/83		10.4	B
WCAP-9395-P	4XL Scale Model Internal Flow Test Structural Response Test	2/79		1.5	O
WCAP-9401-P-A (P) WCAP-9402-NP-A	Verification Testing and Analyses of the 17x17 Optimized Fuel Assembly	3/79	Rev 0	4.2	A
WCAP-9485-A (P) WCAP-9486-A	PALADON-Westinghouse Nodal Computer Code w/Supplement 1 (9/81)	12/78	Rev 0	4.3	A
WCAP-9561-P-A	BART-A1: A computer code for the best estimate analysis of reflood transients	3/84		1.5, 15.6	A

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-9596	17 x 17 x LR D-Loop Evaluation With 9 Grid Standard XL Fuel Assembly, 10 Grid Special Test XL Fuel Assembly, 10 Grid Optimized XL Fuel Assembly Heavy Drive Rod B4C Hybrid Rod Control Cluster Control Assembly	12/79		1.5	0
WCAP-9646	Verification of Upper Head Injection Reactor Vessel Internals by Preoperational Test of the Sequoyah Power Plant	3/81		3.9	0
WCAP-9714-PA (P) WCAP-9750-A	Methodology for the Seismic Qualification of Westinghouse WRP Supplied Equipment	5/80		3.10N	A
WCAP-9600 (P) WCAP-9601	Report on Small Break Accidents for Westinghouse NSSS System	6/79	Rev 0	5.4	A
WCAP-10054-P-A	Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code	4/85		15.6	A
WCAP-10079-P-A	NOTRUMP, A Nodal Transient Small Break and General Network Code	4/85		15.6	A
WCAP-10266-P-A	The 1981 Version of the Westinghouse ECCS Evaluation Model Using the BASH Code	8/86	Rev 2	15.6	A
WCAP-10444-P-A Addendum 2A	VANTAGE 5H Fuel Assembly	4/88	Rev 0	4.2, 4.4	A
WCAP-10559(P) WCAP-10560	Technical Bases for Eliminating Large Primary Loop Pipe Rupture as the Structural Design Basis of South Texas Project Units 1 & 2	7/84		3.6	B
WCAP-10851-P-A (P) WCAP-11873-A	Improved Fuel Performance Models for Westinghouse Fuel Rod Design and Safety Evaluations	6/85	Rev 0	4.2, 4.4	A

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-10865 (P) WCAP-10866	South Texas Plant (TGX) Reactor Internals Flow-Induced Vibration Assessment	6/85		1.5	U
WCAP-10965 (P) WCAP- 10966	ANC: A Westinghouse Advanced Nodal Code	9/86		4.3	A
WCAP-11340 (P) WCAP-11341	Noise, Fault, Surge, and Radio Frequency Interference Test Report: Westinghouse Eagle-21 Digital Family as Used in QDPS, PSMS, RVLIS, and ICCM	12/86		7.1	U
WCAP-11397-P-A	Revised Thermal Design Procedure	2/87	Rev 0	4.4	A
WCAP-11596-P-A	Qualification of the PHOENIX-P/ANC Design System for Pressurized Water Reactor Cores	11/87	Rev 0	4.3	A
WCAP-12330-P	Improved THINC IV Modeling for PWR Design	8/89	Rev 0	4.4	A
WCAP-12472-P-A*	BEACON Core Monitoring and Operations Support System	5/90	Rev 0	4.3	A

a. (P) Proprietary

b. Legend for the review status code letters:

A -NRC review complete; NRC evaluation letter issued.

AE -NRC accepted as part of the Westinghouse emergency core cooling system (ECCS) evaluation model only; does not constitute acceptance for any purpose other than for ECCS analyses.

B -Submitted to NRC as background information; not undergoing formal NRC review.

O -On file with NRC; older generation report with current validity; not actively under Formal NRC review.

U -Actively under formal NRC review.

* Topical Report reference includes NRC-Approved Addenda 1-A and 4.

TABLE 1.6-2 (Continued)

WESTINGHOUSE TOPICAL REPORTS INCORPORATED BY REFERENCE

Westinghouse Topical Report No. [a]	Title Number	NRC Submittal Date	Revision Number	FSAR Section Reference	Review [b] Status
WCAP-14565-P-A	VIPRE-01 Modeling and Qualification for PWR Non-LOCA Thermal Hydraulic Safety Analysis	10/99	Rev. 0	15.4	A
WCAP-14882-P-A	RETRAN-02 Modeling and Qualification for Westinghouse PWR Non-LOCA Safety Analysis	2/99	Rev. 0	15.4	A
WCAP-15063-P-A	Westinghouse Improved Performance Analysis and Design Model (PAD 4.0)	June 1998	Rev. 1	4.2	A
WCAP-16045-P-A	Qualification of the Two-Dimensional Transport Code PARAGON	3/2003	Rev. 0	4.3	A
WCAP-16045-P-A Addendum 1	Qualification of the NEXUS-Nuclear Data Methodology	11/2005	Rev. 0	4.3	A
	Westinghouse Quality Management System (QMS)	February 2011	Rev. 6	4.2	A
	Westinghouse Quality Management System (QMS)	August 2013	Rev. 7	4.2	A
WCAP-16676-NP	Analysis Update for the Inadvertent Loading Event	N/A (issued 3/2009)	Rev. 0	15.4.7	B

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a. (P) Proprietary
b. Legend for the review status code letters:

A -NRC review complete; NRC evaluation letter issued.

AE -NRC accepted as part of the Westinghouse emergency core cooling system (ECCS) evaluation model only; does not constitute acceptance for any purpose other than for ECCS analyses.

B -Submitted to the NRC as background information: not undergoing formal NRC review.

O -On file with NRC; older generation report with current validity; not actively under Formal NRC review.

U -Actively under formal NRC review.

NP -Non-Proprietary

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1.7 ELECTRICAL, INSTRUMENTATION, AND CONTROLS DRAWINGS

Tables 1.7-1, 1.7-2. And 1.7-3 contain lists of nonproprietary electrical, instrumentation, and controls drawings. Table 1.7-1 lists the electrical elementary diagrams, Table 1.7-2 lists the I&C logic diagrams and Table 1.7-3 lists the single line diagrams. These drawings are considered necessary to evaluate the safety-related features described in Chapters 7 and 8 of this Updated Final Safety Analysis Report (UFSAR). The drawings contain cross-references from the logic diagrams to the updated elementary diagrams and vice versa.

TABLE 1.7-1

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-CC22-01	#1	#2	CCW Heat Exchanger Throttle MOVs 0643, 0645, and 0647
9-E-IA04-01	#1	#2	Instrument Air Containment Isolation Valve
9-E-WL66-01	#1	#2	Liquid Waste Miscellaneous Solenoid Valves
9-E-AF0l-01	#1	#2	AFW Pumps 11-13 (Sheets 1 and 2)
9-E-AF0l-02	#1	#2	AFW Pumps 11-13
9-E-AF02-01	#1	#2	AFW Pump 14 Turbine Trip Solenoid SY 7537
9-E-AF03-01	#1	#2	AFW Isolation MOVs 0048, 0065, and 0085
9-E-AF05-01	#1	#2	AFW to Steam Generator Regulator Valves FV 7523-25
9-E-AF06-01	#1	#2	AFW Turbine Steam Inlet MOV 0143
9-E-AF07-01	#1	#2	AFW Crossover Valve FV 7518
9-E-AF08-01	#1	#2	AFW Crossover Valves FVs 7515, 7516, and 7517
9-E-AF09-01	#1	#2	AFW Pump 14 Turbine Trip and Throttle Valve MOV 0514
9-E-AF13-01	#1	#2	AFW to Steam Generator ID Regulator Valve FV 7526
9-E-AF14-01	#1	#2	AFW Turbine Pump 14 Isolation MOV 0019
1-E-AM14-01	N/A	N/A	AMSAC Interface - Train A
2-E-AM14-01	N/A	N/A	AMSAC Interface - Train A
1-E-AM14-02	N/A	N/A	AMSAC Interface - Train B
2-E-AM14-02	N/A	N/A	AMSAC Interface - Train B
1-E-AM14-03	N/A	N/A	AMSAC Interface - Train C

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
2-E-AM14-03	N/A	N/A	AMSAC Interface - Train C
9-E-AP0l-01	#1	#2	Pass Containment Isolation Valves FVs 2453, 2456, and 2457
9-E-AP02-01	#1	#2	Pass Containment Isolation Valves FVs 2454, 2455, and 2458
9-E-AP03-01	#1	#2	Pass Containment Isolation Valves FVs 2455 and 2455A
9-E-BR0l-01	#1	#2	Boron Recycle Evaporator Feed Pumps 1A and 1B
9-E-BR02-01	#1	#2	Recycle Holdup Tank Vent Header Isolation Valve PCV 1251
9-E-BR03-01	#1	#2	Boron Recycle Evaporator Discharge Div. Valve RCV 4202
9-E-BR04-01	#1	#2	Boron Recycle Evaporator Feed Demineralizer Div. Valve TCV 1250
9-E-CC0l-01	#1	#2	CCW Pumps PA101A, PA101B, and PA101C
9-E-CC0l-02	#1	#2	CCW Pumps PA101A, PA101B, and PA101C
9-E-CC02-01	#1	#2	RCFC Chilled Water Supply MOV 0059
9-E-CC03-01	#1	#2	RCFC Chilled Water Return MOV 0070
9-E-CC04-01	#1	#2	RHR CCW Outlet Outside Containment Isolation MOVs 0050, 0130, and 0190
9-E-CC05-01	#1	#2	CCW Common Header Inlet Isolation MOVs 0316, 314, and 0312
9-E-CC06-01	#1	#2	CCW Containment Isolation MOVs 0291, 0318, and 0404
9-E-CC07-01	#1	#2	Reactor Coolant Pumps 1A thru 1D Thermal Barrier CCW Disc. MOVs 339, 374, 390, and 356

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-CC09-01	#1	#2	CCW Common Header Outlet Isolation MOVs 0052, 0132, and 0192
9-E-CC11-01	#1	#2	RCFC CCW Outlet Isolation Inside Containment MOVs 0068, 0147, and 0208
9-E-CC12-01	#1	#2	CCW RHR Outlet Inside Containment Isolation MOVs 0049, 0129, and 0189
9-E-CC13-01	#1	#2	Recycle Pump Inside Containment CCW Outlet Isolation MOVs 0542, and 0403
9-E-CC14-01	#1	#2	RCDT Heat Exchanger and Excess Letdown Heat Exchanger Isolation MOVs 0297 and 0393
9-E-CC15-01	#1	#2	RCDT Heat Exchanger CCW Isolation MOV 0392
9-E-CC16-01	#1	#2	CCW Common Loads Isolation MOVs 0032 and 0447
9-E-CC17-01	#1	#2	CCW RCP Containment Outside Isolation Valve FV 4493
9-E-CC19-01	#1	#2	CCW Radiation Monitor Inlet Valves FVs 4524, 4525, and 4526
9-E-CC20-01	#1	#2	CCW RHR Valves FVs 4531, 4548, and 4565
9-E-CC21-01	#1	#2	CCW Heat Exchanger Bypass MOVs 0642, 0644, and 0646
9-E-CC23-01	#1	#2	CCW RCFC Supply Isolation MOV 0057
9-E-CC24-01	#1	#2	CCW RCFC Return Isolation MOV 0069
9-E-CC25-01	#1	#2	Reactor Containment Fan Coolers 11A and C Inlet MOVs 0064/0204
9-E-CC26-01	#1	#2	Reactor Containment Fan Coolers CCW MOVs 0143, 0146, 0139, and 0142
9-E-CC28-01	#1	#2	RCFC Chilled Water Return MOV 0149

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-CC29-01	#1	#2	Residual Heat Removal CCW Inlet Containment Isolation MOVs 0012, 0122, and 0182
9-E-CC30-01	#1	#2	CCW Common Loads SI Isolation MOVs 0235 and 0236
9-E-CC31-01	#1	#2	Reactor Containment Fan Coolers MOVs 0060 and 0200
9-E-CC32-01	#1	#2	Reactor Containment Fan Coolers MOVs 0063 and 0203
9-E-CC33-01	#1	#2	Reactor Containment Fan Coolers MOVs 0067 and 0207
9-E-CC34-01	#1	#2	CCW Surge Tank Make-up Valve LV 4501
9-E-CC35-01	#1	#2	RCFC Chilled Water Supply MOV 0137
9-E-CC36-01	#1	#2	CCW ECW Standby Train Start
9-E-CC37-01	#1	#2	CCW RCFC Supply Isolation MOV 0136
9-E-CC38-01	#1	#2	CCW RCFC Supply Isolation MOV 0197
9-E-CC39-01	#1	#2	CCW RCFC Return Isolation MOV 0148
9-E-CC40-01	#1	#2	CCW RCFC Return Isolation MOV 0210
9-E-CC41-01	#1	#2	RCFC Chilled Water Return MOV 0209
9-E-CC42-01	#1	#2	RCFC Chilled Water Supply MOV 0199
9-E-CC44-01	#1	#2	CCW to Charging Pump Supply MOV 0768
9-E-CC45-01	#1	#2	CCW to Charging Pump Return MOV 0772
9-E-CC46-01	#1	#2	CCW to Charging Pump Supply MOVs 0770 and 0771
9-E-CC47-01	#1	#2	CCW to Charging Pump Return MOVs 0774 and 0775

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-CC48-01	#1	#2	CCW to Centrifugal Charging Pump Cross Connect Supply and Return Valve FYs 4656A and 4657A
9-E-CC49-01	#1	#2	CCW to Centrifugal Charging Pump Cross Connect Supply and Return Valve FYs 4656B, 4657B, 4656C, and 4657C
9-E-CC50-01	#1	#2	CCW to Post Accident Sampling System Isolation Valves FVs 4540 and 4541
9-E-CH01-01	#1	#2	RCB HVAC Chilled Water Pumps PAOO1 and PA003
9-E-CH01-02	#1	#2	RCB HVAC Chilled Water Pump PA002
9-E-CH03-01	#1	#2	RCB HVAC Chilled Water Chiller Units CH001, CH002, and CH003
9-E-CH03-03	#1	#2	RCB HVAC Chilled Water Condenser and Evaporator Flow Valves
9-E-CH05-01	#1	#2	MAB HVAC Chilled Water Pumps PA004, PA005, PA006, and PA007
9-E-CH06-01	#1	#2	MAB HVAC Chilled Water Chiller Units CH001, CH002, CH003, and CH004
9-E-CH06-03	#1	#2	MAB HVAC Chilled Water Condenser and Evaporator Flow Valves
9-E-CH07-01	#1	#2	EAB HVAC Essential Chilled Water Pumps PA004, PA005, and PA006
9-E-CH11-01	#1	#2	EAB HVAC Essential Chilled Water Chiller Units CH004, CH005, and CH006
9-E-CH13-01	#1	#2	MAB HVAC Supply System Chilled Water Cooling Coils
9-E-CH15-01	#1	#2	EAB HVAC TSC Chilled Water Chiller Units CHOO1 and CH002
9-E-CH16-01	#1	#2	FHB HVAC Chilled Water Cooling Coils Control Valve TYs 9504, 9503, and 9502

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-CH17-01	#1	#2	EAB HVAC Main Area and Control Room Chilled Water Cooling Coil Valve
9-E-CH19-01	#1	#2	EAB HVAC TSC Chilled Water Pumps PAOO1 and PA002
9-E-CH20-01	#1	#2	EAB HVAC TSC Computer Room AHU Inlet Valves MOV-9786 and MOV-9787
9-E-CH21-01	#1	#2	EAB HVAC Computer Room AHU Inlet Valves MOV-9771 and MOV-9772
9-E-CM01-01	#1	#2	Containment Hydrogen Monitor Isolation Valves FVs 4101, 4127, 4104, and 4133
9-E-CM04-01	#1	#2	Containment Hydrogen Monitor Isolation Valves FVs 4128, and 4134
9-E-CM05-01	#1	#2	Containment Hydrogen Monitor Sample Select Valve FVs 4100, 4124, 4125, 4126, 4103, 4129, 4130, and 4131
9-E-CS01-01	#1	#2	Containment Spray Pumps PA101A, PA101B, and PA101C
9-E-CS01-02	#1	#2	Containment Spray Pumps PA101A
9-E-CS02-01	#1	#2	Containment Spray Pump 1A, 1B, and 1C Disc Isolation MOVs 0001A, 0001B, and 0001C
9-E-CVO1-01	#1	#2	Reactor Coolant Purification Pump PA104A

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-CV02-01	#1	#2	Reactor Coolant Pump Seal Standpipe Fill Valves LCVs 0178, 0179, 0180, and 0181
9-E-CV04-01	#1	#2	Volume Control Tank Valve PCV 0115
9-E-CV05-01	#1	#2	CVCS Volume Control Tank Outlet Isolation MOVs 0112B and 0113A
9-E-CV06-01	#1	#2	CVCS Reactor Coolant System Altrn Charging MOV 0006 and Normal Charging MOV 003
9-E-CV07-01	#1	#2	CVCS Charging Line Block MOV 0025
9-E-CV08-01	#1	#2	CVCS Seal Water Injection Isolation MOVs 0033A, B, C, and D
9-E-CV09-01	#1	#2	CVCS Excess Letdown Line Isolation MOVs 0083 and 0082
9-E-CV11-01	#1	#2	CVCS Boric Acid Makeup Isolation MOV 0218
9-E-CV12-01	#1	#2	CVCS Letdown Orifice Isolation MOV 0012
9-E-CV12-02	#1	#2	CVCS Letdown Orifice Isolation MOV 0014
1-E-CV12-03	N/A	N/A	CVCS Letdown Orifice Isolation FV-0012
2-E-CV12-03	N/A	N/A	CVCS Letdown Orifice Isolation FV-0012
1-E-CV12-04	N/A	N/A	CVCS Letdown Orifice Isolation FV-0013
2-E-CV12-04	N/A	N/A	CVCS Letdown Orifice Isolation FV-0013
1-E-CV12-05	N/A	N/A	CVCS Letdown Orifice Header Isolation FV-0011
2-E-CV12-05	N/A	N/A	CVCS Letdown Orifice Header Isolation FV-0011
9-E-CV13-01	#1	#2	CVCS Letdown Stop Valve LCV 0465
9-E-CV13-02	#1	#2	CVCS Letdown Stop Valve LCV 0468

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-CV14-01	#1	#2	BA Filter to Make Up Flow Control Valve FCV 0110A
9-E-CV15-01	#1	#2	BA Blend To Charging Pump Suction and Volume Control Tank Inlet Valves FCVs 0110B and 0111B
9-E-CV16-01	#1	#2	Reactor Make-up Water Flow Control Valve FCV 0111A
9-E-CV18-01	#1	#2	CVCS Steam Valve to Boric Acid Batching Valve TCV 0100
9-E-CV19-01	#1	#2	CVCS Letdown on Valve to Volume Control Tank or Recycle Holdup Tank LCV 0112A
9-E-CV20-01	#1	#2	CVCS Letdown to Demineralizers Diversion Valves TCV 0143
9-E-CV21-01	#1	#2	Reactor Coolant Pumps 1A, 1B, 1C, and 1D Seal Shutoff Isolation Valve FVs 3154, 3155, 3156, and 3157
9-E-CV22-01	#1	#2	Centrifugal Charging Pumps 1A and 1B Miniflow Valve FCVs 0201 and 0202
9-E-CV23-01	#1	#2	Excess Letdown Diversion Valve FV 3123
9-E-CV24-01	#1	#2	Aux. Lube Oil Pumps For Charging Pumps 1A, 1B (PA101C and PA101D)
9-E-CV26-01	#1	#2	Centrifugal Charging Pumps 1A and 1B (PA101A and PA101B)
9-E-CV27-01	#1	#2	Boric Acid Transfer Pumps 1A and 1B (PA103A and PA103B)
9-E-CV28-01	#1	#2	CVCS Seal Water Return Isolation MOV 0079
9-E-CV29-01	#1	#2	Letdown Isolation MOV 0023 CVCS
9-E-CV30-01	#1	#2	Positive Displacement Charging Pump 1A (PA102)

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-CV31-01	#1	#2	CVCS Reactor Water Storage Tank To Charging Pump MOVs 0112C and 0113B
9-E-CV32-01	#1	#2	CVCS Letdown Isolation MOV 0024
9-E-CV33-01	#1	#2	Reactor Coolant System Auxiliary Spray Valve LV 3119
9-E-CV34-01	#1	#2	Boron Concentration Measuring System Isolation Valves FVs 3124, 3125, and 3126
9-E-CV35-01	#1	#2	Battery Chiller Pumps 1A and 1B (PA101A and 101B)
9-E-CV36-01	#1	#2	CVCS Seal Water Return Isolation MOV 0077
9-E-CV37-01	#1	#2	Boron Thermal Regenerator Chiller CH101A
9-E-CV38-01	#1	#2	Pressure Level and Charging Flow Valve FCV 0205
9-E-CV40-01	#1	#2	Centrifugal Charging Pump 1A and 1B Isolation MOVs 8377A and 8377B, and Bypass MOV 8348
9-E-CV41-01	#1	#2	Seal Water Injection Valve HCV 0218
9-E-CV43-01	#1	#2	RCPCS Isolation Valves FVs 8400A and 8400B
9-E-DB01-01	#1	#2	BOP Emergency Diesel Generator No. 1 Control
9-E-DB02-01	#1	#2	480 V Load Center 1W Incoming Breaker
9-E-DG01-01	#1	#2	Standby Diesel Generator DGs 11, 12, and 13 4.16 kV Feeder Breakers
9-E-DG01-02	#1	#2	Standby Diesel Generator DGs 11, 12, and 13 4.16 kV Feeder Breakers
9-E-DG02-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Metering
9-E-DG03-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Control, Instrumentation and Alarms

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-DG03-02	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Control Instrumentation and Alarm
9-E-DG04-02	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Emergency Control and Instrumentation
9-E-DG05-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Protection and Control
9-E-DG06-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Miscellaneous Controls
9-E-DG04-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Emergency Control and Instrumentation
9-E-DO01-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Standby Fuel Oil Pumps RFs 0134, 0234, and 0334
9-E-DO02-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Fuel Oil Transfer Drip Pump PAs 0134, 0234, and 0334
9-E-ED17-01	#1	#2	Radiation Equipment and Floor Drain Sump Inside Containment Isolation MOV 0064
9-E-ED18-01	#1	#2	Radiation Equipment and Floor Drain Sump Outside Containment Isolation Valve FV 7800
9-E-EW01-01	#1	#2	Essential Cooling Water Pumps 1A, 1B, and 1C
9-E-EW01-02	#1	#2	Essential Cooling Water Pumps 1A, 1B, and 1C
9-E-EW02-02	#1	#2	Essential Cooling Water Screen Wash Boost Pumps 1A, 1B, and 1C
9-E-EW03-02	#1	#2	ECW Self Cleaning Strainers 1A, 1B, and 1C
9-E-EW04-02	#1	#2	Essential Cooling Water Pump Discharging MOVs 0121, 0137, and 0151
9-E-EW05-02	#1	#2	ECW Travelling Water Screens 1A, 1B, and 1C

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-EW06-01	#1	#2	ECW Blowdown Isolation Valves FVs 6935, 6936, and 6937
9-E-EW07-01	#1	#2	ECW Screen Wash Valves FVs 6914, 6924, and 6934
9-E-FC01-01	#1	#2	Spent Fuel Pool Cooling Pump 1A and 1B (PA101A and PA101B)
9-E-FC02-01	#1	#2	Spent Fuel Pool Skimmer Pump 1A (PA102A)
9-E-FC03-01	#1	#2	Refueling Water Purification Pump 1A (PA103A)
9-E-FP19-01	#1	#2	Fire Protection Containment Isolation Valve MOV 0756
9-E-FW03-01	#1	#2	Feedwater Control Valves FCVs 0551, 0552, 0553, and 0554
9-E-FW03-02	#1	#2	Feedwater Control Valves FCVs 0551, 0552, 0553, and 0554
9-E-FW06-01	#1	#2	Feedwater Isolation Bypass Valves FVs 7145A, 7146A, 7147A, and 7148A
9-E-FW06-02	#1	#2	Feedwater Isolation Bypass Valves FVs 7145A, 7146A, 7147A, and 7148A
9-E-FW06-03	#1	#2	Feedwater Isolation Bypass Valves FVs 7145A, 7146A, 7147A, and 7148A
9-E-FW07-01	#1	#2	Main Feedwater Isolation Valve FVs 7141A, 7142A, 7143A, and 7144A (Train A)
9-E-FW07-02	#1	#2	Main Feedwater Isolation Valve FVs 7141, 7142, 7143, and 7144 (Train B)
9-E-FW07-03	#1	#2	Main Feedwater Isolation Valves FVs 7141, 77142, 7143, and 7144
9-E-FW07-04	#1	#2	Main Feedwater Isolation Valve FVs 7141A, 7142A, 7143A, and 7144A (Train A)

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-FW08-01	#1	#2	Feedwater Bypass Control Valves FVs 7151, 7152, 7153, and 7154
9-E-FW08-02	#1	#2	Feedwater Bypass Control Valves FVs 7151, 7152, 7153, and 7154
9-E-FW20-01	#1	#2	Steam Generator Feed Pump No. 11, 12, and 13 Start Permissives
9-E-FW26-01	#1	#2	Startup Steam Generator Feed Pump PA007
9-E-FW26-02	#1	#2	Startup Steam Generator Feed Pump PA007
9-E-FW29-01	#1	#2	Steam Generator Bypass Valves FV-7189, FV-7190, FV-7191, and FV-7192
9-E-FW29-02	#1	#2	Steam Generator Preheater Bypass Valves FV-7189, FV-7190, FV-7191, and FV-7192
9-E-FW29-03	#1	#2	Steam Generator Preheater Bypass Valves FV-7189, FV-7190, FV-7191, and FV-7192
9-E-HC01-01	#1	#2	RCB HVAC MSIV Cubicle Vent Fans FNs 001, 002, and 003
9-E-HC01-02	#1	#2	RCB HVAC MSIV Cubicle Vent Fan FN004
9-E-HC02-01	#1	#2	RCB HVAC Normal Purge Supplement Duct Heating Coil
9-E-HC02-02	#1	#2	RCB HVAC Normal Purge Supply Heating Coils HX001A and HX001B
9-E-HC03-01	#1	#2	RCB HVAC Normal Purge Supply Fans FNs 007 and 008
9-E-HC03-02	#1	#2	RCB HVAC Normal Purge Supply Damper FV 9694
9-E-HC04-01	#1	#2	RCB HVAC Containment Supplementary Purge Heating Coil HX002

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-HC04-02	#1	#2	RCB HVAC Supplementary Purge Supply Heating Coil HX002
9-E-HC05-01	#1	#2	RCB HVAC Normal Containment Purge Exhaust Fans FN009 and FN010
9-E-HC06-01	#1	#2	RCB HVAC Supplementary Containment Purge Supply Fans FN011 and FN012
9-E-HC06-02	#1	#2	RCB HVAC Supplementary Containment Purge Supply Control Damper FV-9594
9-E-HC07-01	#1	#2	RCB HVAC Supplementary Containment Purge Exhaust Fans FN013 and FN014
9-E-HC08-01	#1	#2	RCB HVAC Reactor Supplement Exhaust Fans FN036 and FN037
9-E-HC09-01	#1	#2	RCB HVAC MSIVC Penetration and Restraints Vent Fans FN040 and FN041
9-E-HC09-02	#1	#2	RCB HVAC MSIVC Penetration and Restraint Vent Fans FN042 and FN043
9-E-HC09-03	#1	#2	RCB HVAC MSIVC Penetration and Restraint Vent Fans FN044 and FN045
9-E-HC09-04	#1	#2	RCB HVAC MSIVC Penetration and Restraint Vent Fans FN046 and FN047
9-E-HC11-01	#1	#2	RCB HVAC RCFC Vent Supply Fans FN001 and FN002
9-E-HC12-01	#1	#2	RCB HVAC RCFC Ventilation Supply Fans FN003 and FN004
9-E-HC13-01	#1	#2	RCB HVAC RCFC Ventilation Supply Fans FN005 and FN006
9-E-HC14-01	#1	#2	RCB HVAC Containment Cubicle Exhaust Fans FN027 and FN028

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-HC17-01	#1	#2	RCB HVAC Supplement Containment Purge Isolation MOV 0003
9-E-HC18-01	#1	#2	RCB HVAC Supplement Containment Purge Exhaust Isolation MOV 0005
9-E-HC19-01	#1	#2	RCB HVAC Normal Containment Purge Isolation MOVs 0007 and 0010
9-E-HC20-01	#1	#2	RCB HVAC Normal Containment Purge Control Isolation MOVs 0009 and 0008
9-E-HC21-01	#1	#2	RCB HVAC CRDM Vent Fans FNs 017, 018, and 019
9-E-HC22-01	#1	#2	RCB HVAC Tendon Gallery Tunnel Vent Fans FN021 and FN022
9-E-HC23-01	#1	#2	RCB HVAC Reactor Cavity Vent Fans FN023 and FN024
9-E-HC24-01	#1	#2	RCB HVAC Containment Carbon Unit A and B Supply Fans FNs 029, 030, 031, and 032
9-E-HC24-02	#1	#2	RCB HVAC Containment Carbon Unit Fan Dampers FVs 9759, 9760, 9761, and 9762
9-E-HC24-03	#1	#2	RCB HVAC Containment Carbon Unit Fan Dampers, FVs 9737 and 9738
9-E-HC28-01	#1	#2	RCB HVAC Containment Cubicle Exhaust Fans FN029 and FN030
1-E-HC32-01	N/A	N/A	RCB HVAC Supplementary Containment Purge Isolation Valves FV-9776 and 9777
2-E-HC32-01	N/A	N/A	RCB HVAC Supplementary Containment Purge Isolation Valves FV-9776 and 9777

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-HE01-01	#1	#2	EAB HVAC Control Room Cleanup Filter Return Damper FVs 9677, 9676, and 9675
9-E-HE02-01	#1	#2	EAB HVAC Control Room Smoke Purge Exhaust and Return Air Dampers
9-E-HE02-02	#1	#2	EAB HVAC Control Room Envelope, Isolation Dampers FVs 9670, 9671, 9673, 9667, 9668, 9674, 9664, and 9665
9-E-HE03-01	#1	#2	EAB HVAC Main Area Smoke Purge Inlet Outlet and Return Dampers FVs 9643 through 9651
9-E-HE04-01	#1	#2	EAB HVAC Control Room Supply AHU AH007, AH008, and AH009, and FN017, FN018, and FN019
9-E-HE05-01	#1	#2	EAB HVAC Control Room Return Air Fans FN025, FN026, and FN027
9-E-HE05-02	#1	#2	EAB HVAC Control Room Envelope Return Air Dampers FVs 9698, 9697, and 9696
9-E-HE06-01	#1	#2	EAB HVAC Control Room Kitchen/Toilet Exhaust Fan FN039
9-E-HE07-01	#1	#2	EAB HVAC Control Room Envelope Fire Protection Dampers
9-E-HE07-02	#1	#2	EAB HVAC Control Room Fire Protection Dampers
9-E-HE08-01	#1	#2	EAB HVAC Elevator No. 4 Machine Room Exhaust Fan FN013
9-E-HE08-02	#1	#2	EAB HVAC Elevator No. 4 Machine Room Intake and Exhaust Dampers
9-E-HE09-01	#1	#2	EAB HVAC Main Supply Air Vent Fans FNs 014, 015, and 016
9-E-HE09-02	#1	#2	EAB HVAC Supply AHU Outlet Dampers FVs 9656, 9657, 9654, 9655, 9652, and 9653

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-HE11-01	#1	#2	EAB HVAC Shunt Trip Control Circuit for Reheat Coils
9-E-HE11-02	#1	#2	EAB HVAC Miscellaneous Reheat Coils
9-E-HE11-03	#1	#2	EAB HVAC EAB and Control Room Outside Air Reheat Coil HX010
9-E-HE12-01	#1	#2	EAB HVAC Battery Room Exhaust Fans FN0l0, FN011, and FN012
9-E-HE13-01	#1	#2	EAB HVAC Return Air Fans FN001, FN002, and FN003
9-E-HE14-01	#1	#2	EAB HVAC Control Room Make-Up Air Fans FN004, FN005, and FN006
9-E-HE14-02	#1	#2	EAB HVAC Control Room Make-Up Air Filter Dampers FVs 9339, 9365, and 9391
9-E-HE15-01	#1	#2	EAB HVAC Control Room Cleanup Unit XV00l, XV002, and XV003, and Air Fans FN007, FN008, and FN009
9-E-HE16-01	#1	#2	EAB HVAC Battery Rooms Heating Coils HXs 008, 009, 011, and 012
9-E-HE17-01	#1	#2	EAB HVAC Control Room Outside Air Make-Up Unit Heating Coils HXs 004, 005, and 006
9-E-HE18-01	#1	#2	EAB HVAC Control Room Make-Up Air Flow Control Dampers FCV-9584, FCV-9585, and FCV-9586
9-E-HE21-01	#1	#2	EAB HVAC TSC Make-Up Air Unit Heating Coil HX017
9-E-HE22-01	#1	#2	EAB HVAC Tech. Support Center Supply Air Fans FN015 and FN016
9-E-HE23-01	#1	#2	EAB HVAC Tech. Support Center TSC Return Air Fans FN017 and FN018
9-E-HE24-01	#1	#2	EAB HVAC Tech. Support Center Equipment

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			Room Vent Fans FN022 and FN023
9-E-HE24-02	#1	#2	EAB HVAC Tech. Support Center Equipment Room Intake and Exhaust Air Dampers
9-E-HE25-01	#1	#2	EAB HVAC Main Area AHU Heating Coil HX009, HX012, and HX015
9-E-HE26-01	#1	#2	EAB HVAC Computer Room Handling Units AH001 and AH002
9-E-HE26-03	#1	#2	EAB HVAC Technical Support Center Comp Room Air Handling Unit AH004
9-E-HE26-04	#1	#2	EAB HVAC Technical Support Center Comp Room Air Handling Unit AH005
9-E-HE27-01	#1	#2	EAB HVAC Penetration Space Exhaust Fans FN015 and FN016
9-E-HE28-01	#1	#2	EAB HVAC Penetration Space Normal AHU AH006, AH007, and AH008, and Fans FN027, FN026, and FN025
9-E-HE29-01	#1	#2	EAB HVAC Tech. Support Center Locker Room Exhaust Fan FN019
9-E-HE30-01	#1	#2	EAB HVAC Tech. Support Center Reheat Coils HXs 013, 014, 015, 016, and 018
9-E-HE31-01	#1	#2	EAB HVAC Tech. Support Center Make-Up Unit Air Fan FN014
9-E-HE31-02	#1	#2	EAB HVAC Tech. Support Center Make-Up Carbon Filter Outlet Damper HCV9608
9-E-HE32-01	#1	#2	EAB HVAC TSC Supply Air and Exhaust Fan Inlet and Makeup Air Dampers
9-E-HE33-01	#1	#2	EAB HVAC Electrical Penetration Space Emergency Fans FN030, FN031, and FN032
9-E-HE34-01	#1	#2	EAB HVAC Tech. Support Center Return Air Dampers FVs 9687 and 9702

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-HE34-02	#1	#2	EAB HVAC Tech. Support Center Smoke Purge Air and Return Air Dampers FVs 9688 and 9746
9-E-HF0l-01	#1	#2	FHB HVAC Supply Air Duct Heating Coils HXs 001, 002, and 003
9-E-HF0l-02	#1	#2	FHB HVAC Supply Air Duct Heating Coils HXs 001, 002, and 003
9-E-HF03-01	#1	#2	FHB HVAC LHSI Pump Supply Cooler Units Fans (AH004, AH005, and AH006)
9-E-HF05-01	#1	#2	FHB HVAC Main Exhaust Fans FN004, FN005, and FN006
9-E-HF06-01	#1	#2	FHB HVAC Exhaust Booster Fans FN007, FN008, and FN009
9-E-HF07-01	#1	#2	FHB HVAC Main Supply Fans FN001, FN002, and FN003
9-E-HF07-02	#1	#2	FHB HVAC Relief Supply Damper FVs 9500 and 9500A
9-E-HF08-01	#1	#2	FHB HVAC Exhaust Heaters 11A, 12A and 13A
9-E-HF09-01	#1	#2	FHB HVAC Exhaust Air Bypass Line Dampers FV-9549D and FV-9549C
9-E-HF09-02	#1	#2	FHB HVAC Differential Pressure Containment MOD Damper (PDV 9548)
9-E-HF11-01	#1	#2	FHB HVAC Supply Sub System Isolation Dampers FVs 9510, 9520, and 9530
9-E-HF11-02	#1	#2	FHB HVAC Exhaust Filter Inlet Dampers FVs 9549 and 9549A
9-E-HF12-01	#1	#2	FHB HVAC Containment Spray IV Cubicle Supplementary Coolers AHs 012, 013, and 014
9-E-HF13-01	#1	#2	FHB HVAC Exhaust Heaters 11B, 12B and 13B

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-HF14-01	#1	#2	FHB HVAC Elevator Exhaust Fans FN010 and FN011
9-E-HF15-01	#1	#2	FHB HVAC Exhaust Filter Outlet Dampers HV-9507 and HV-9507A
9-E-HF18-01	#1	#2	FHB HVAC Spent Fuel Pump Room Supplementary Cooler AHU AH0l0 and AH0ll
9-E-HG01-01	#1	#2	DGB HVAC Emergency Vent Fans FN00l, FN002, and FN003
9-E-HG01-02	#1	#2	DGB HVAC Modulating Dampers Intake and Recirculation
9-E-HG02-01	#1	#2	DGB HVAC Normal Vent Fans FN007, FN008, and FN009
9-E-HG03-01	#1	#2	DGB HVAC Oil Tank Room Exhaust Fans FN004, FN005, and FN006
9-E-HG03-02	#1	#2	DGB HVAC Oil Tank Room Exhaust Fan Dampers FVs 9746, 9747, and 9748
9-E-HM01-01	#1	#2	MAB HVAC EAB Makeup Air From MAB Supply Damper
9-E-HM02-01	#1	#2	MAB HVAC Supply Air Duct Heating Coils HXs 003, 003A, 004, and 004A
9-E-HM02-02	#1	#2	MAB HVAC Duct Heaters HXs 003, 003A, 004, and 004A
9-E-HM03-01	#1	#2	MAB HVAC Supply Fans FN021, FN022 and FN020
9-E-HM03-02	#1	#2	MAB HVAC Main Supply Fan Control Dampers FVs 9212, 9213, and 9214
9-E-HM05-01	#1	#2	MAB HVAC Supply System A and B Isolation Dampers
9-E-HM08-01	#1	#2	MAB HVAC CCW Pump Room Cooling AHU

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			AH00l, AH002 and AH003
9-E-HM09-01	#1	#2	MAB HVAC Positive Displacement Charging Pump Cubicle Cooler AHU AH006
9-E-HM12-01	#1	#2	MAB HVAC Centrifugal Charging Pump Cubicle Cooler AHU AH005 and AH004
9-E-HM17-01	#1	#2	MAB HVAC Essential Chilled Water Area AHU AH019, AH020, and AH021
9-E-HM18-01	#1	#2	MAB HVAC Valve Cubicle Room Cooler AHU AHs 010, 011, and 007
9-E-HM18-02	#1	#2	MAB HVAC Valve Cubicle Room Cooler AHU AH014 and AH015
9-E-HM19-01	#1	#2	MAB HVAC Boric Acid Pump Room Cooler AHU AHs 008 and 009
9-E-HM20-01	#1	#2	MAB HVAC Reactor Make-Up Water Pump AHU AH013 and AH012
9-E-HM22-01	#1	#2	MAB HVAC Radiation Monitor Room AHU AH022 and AH023
9-E-HM23-01	#1	#2	MAB HVAC Radioactive Waste Control AHU AH016 and AH018
9-E-HZ0l-01	#1	#2	ECW HVAC Pump Building Vent Fans FN001, FN003, and FN005
9-E-HZ02-01	#1	#2	ECW HVAC Pump Building Vent Fans FN002, FN004, and FN006
9-E-HZ03-01	#1	#2	ECW HVAC Intake and Exhaust Air Dampers FVs 9894, 9895, 9896, 9894A, 9895A, and 9896A
9-E-JW0l-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Standby Jacket Water Pumps (AB0134, AB0234, and AB0334)
9-E-JW02-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Jacket Water Circulation Pumps (PX0134, PX0234, and

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			PX0334)
9-E-JW03-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Jacket Water Heaters (WH0134, WH0234, and WH0334)
9-E-LU0l-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Standby Lube Oil Pumps PCs 0134, 0234, and 0334
9-E-LU02-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Lube Oil Circulation Pumps PUs 0134, 0234, and 0334
9-E-LU03-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Lube Oil Heaters (HXs 0134, 0234, and 0334)
9-E-MS05-01	#1	#2	Main Steam To Dearator Control Valves PVs 7174 and 7174A
9-E-MS07-01	#1	#2	Steam Dump Valves Control Interlock
9-E-MS11-02	#1	#2	Master Block Diagram Main Steam Generator System Steam Dump Valves - NSSS Interface
9-E-MS11-03	#1	#2	Master Block Diagram Main Steam Generator System Steam Dump Valves - NSSS Interface
9-E-MS11-05	#1	#2	Master Block Diagram Main Steam Generator System Steam Dump Valves - NSSS Interface
9-E-MS13-01	#1	#2	Main Steam Isolation Valves FSVs 7414, 7424, 7434, and 7444
9-E-MS13-02	#1	#2	Main Steam Isolation Solenoid Valves FYs 7414A, 7414D, 7424A, 7424D, 7434A, 7434D, 7444A, and 7444D
9-E-MS13-03	#1	#2	Main Steam Isolation Solenoid Valves FYs 7414B, 7424B, 7434B, and 7444B
9-E-MS16-01	#1	#2	Main Steam Isolation Bypass Solenoid Valves FYs 7412, 7422, 7432, and 7442
9-E-MS16-02	#1	#2	Main Steam Isolation Bypass Solenoid Valves FYs 7412A, 7422A, 7432A, and 7442A

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-MS17-01	#1	#2	Main Steam Isolation Bypass Solenoid Valves FYs 7412C, 7422C, 7432C, and 7442C
9-E-MS18-01	#1	#2	SGA, B, C PORV PVs 7411, 7421, and 7431 Hydraulic Pumps
9-E-MS19-01	#1	#2	Steam Generator A, B, C, and D PORV Servo Amplifier
9-E-MS19-02	#1	#2	Steam Generator A, B, C, and D PORV N2 Control Solenoid Valves
9-E-PC02-01	#1	#2	13.8 kV Bus 1F, 1G, 1H, and 1J Feeder Breaker to 480V L/C Transformers 1F/1T/1U2, 1F2, 1G1, 1G2/1R/1U1
9-E-PC03-01	#1	#2	13.8 kV Bus 1F/G/H for Breakers E1A, B, and C to Auxiliary Transformer E1A, B, and C
9-E-PC04-01	#1	#2	13.8 kV Bus 1G, 1H Feedwater Breaker Transformer to Transformers 1D1 and 1D2
9-E-PC05-01	#1	#2	13.8 kV 1F Auxiliary and Standby Bus TIE Breaker T-120
9-E-PC06-01	#1	#2	13.8 kV Bus 1F, 1G, 1H, and 1J Feeder Breaker to 480V L/C Transformers 12F1/12M1 and 12F3/12M2
9-E-PC07-01	#1	#2	13.8 kV Standby Bus 1F Supply Breaker S-120 from Standby 1 Transformer
9-E-PC08-01	#1	#2	13.8 kV Auxiliary Bus 1F Supply Breaker P-120
9-E-PC09-01	#1	#2	13.8 kV Auxiliary Bus 1J Supply Breaker ST-170 from No. l Standby Transformer
9-E-PC11-01	#1	#2	13.8 kV Auxiliary Bus 1J Supply Breaker ST-190 from No. 2 Standby Transformer
9-E-PC14-01	#1	#2	13.8 kV Bus 1F, 1G, 1H, and 1J Feeder Breaker to 480V L/C Transformers 12G1, 12G2/1W1, 12J1/12K2/12L, 12J2/12K1

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-PC17-01	#1	#2	13.8 kV Standby Bus lF Supply Breaker ST-140 from No. 2 Standby Transformer
9-E-PC19-01	#1	#2	13.8 kV 1G Auxiliary and Standby Bus Tie Breaker T-140
9-E-PC20-01	#1	#2	13.8 kV 1H Auxiliary and Standby Bus Tie Breaker T-130
9-E-PC21-01	#1	#2	13.8 kV Standby Bus 1G Supply Breaker ST-160 from No. 1 Standby Transformer
9-E-PC22-01	#1	#2	13.8 kV Standby Bus 1H Supply Breaker ST-130 No. 1 Standby Transformer
9-E-PC23-01	#1	#2	13.8 kV Auxiliary Bus lG Supply Breaker P-140
9-E-PC24-01	#1	#2	13.8 kV Auxiliary Bus lH Supply Breaker P-130
9-E-PC25-01	#1	#2	13.8 kV Standby Bus 1G Supply Breaker ST-180 from No. 2 STB
9-E-PC26-01	#1	#2	13.8 kV Standby Bus 1H Supply Breaker ST-150 from No. 2 Standby Transformer
9-E-PC27-01	#1	#2	13.8 kV Auxiliary Bus 1J Supply Breaker P-150 from Unit Auxiliary Transformer
9-E-PE45-01	#1	#2	480 V Load Center 1W Normal Supply Breaker Control
0-E-PG01-01	N/A	N/A	13.8 kV Emergency Transformer Protection
1-E-PG01-01	N/A	N/A	13.8 kV Emergency Bus 1K Supply Breaker SG-lK and Bus lK Pt Circuits
2-E-PG01-01	N/A	N/A	13.8 kV Emergency Bus 1K Supply Breaker SG-2K and Bus 1K Pt Circuits
9-E-PG0l-01	#1	#2	13.8 kV Bus 1L FDR Breaker ElA (E) to Transformer E1A and Bus 1L Metering
9-E-PG02-01	#1	#2	13.8 kV Bus 1L FDR Breaker E1B(E), E1C(E) to

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
			Auxiliary Transformer E1B, and E1C
0-E-PG03-01	N/A	N/A	13.8 kV Emergency Circuit Switcher and Ground Switch
9-E-PK01-01	#1	#2	4.16 kV ESF Bus E1A, B, and C Supply Breaker Control
9-E-PK01-02	#1	#2	4.16 kV ESF Bus E1A, B, and C Supply Breaker Control
9-E-PK02-01	#1	#2	4.16 kV Feeder to 480 V Load Center Transformers E1A1, B1, and C1
9-E-PK03-01	#1	#2	4.16 kV Feeder to 480V Load Center Transformers E1A2, B2, and C2
9-E-PK04-01	#1	#2	ESF Transformer and 4.16 kV Bus ElA, B, and C Protection and Metering Circuit
9-E-PK04-02	#1	#2	ESF Transformer and 4.16 kV Bus ElA, ElB, and ElC Protection and Metering
9-E-PL01-01	#1	#2	480 V Load Center E1A Incoming Breaker Bus ElAI and E1A2
9-E-PL02-01	#1	#2	480 V Load Center ElA Tie Breaker ElAl and ElA2
9-E-PL03-01	#1	#2	480 V Load Center E1A Feeder Breaker to MCC E1A1, E1A2, E1A3, and E1A4
9-E-PL05-01	#1	#2	480 V Load Center E1B Incoming Breaker Bus E1B1 and E1B2
9-E-PL06-01	#1	#2	480 V Load Center E1B Tie Breaker E1B1 and E1B2
9-E-PL07-01	#1	#2	480 V Load Center E1B Feeder Breaker To MCC E1B1, E1B2, E1B3, and E1B4
9-E-PL09-01	#1	#2	480 V Load Center E1C Incoming Breaker Bus E1C1 and E1C2

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-PL11-01	#1	#2	480 V Load Center E1C Tie Breaker ElCl and ElC2
9-E-PL12-01	#1	#2	480 V Load Center ElC Feeder Breaker to MCC No. ElC1, E1C2, E1C3, and E1C4
9-E-PN01-01	#1	#2	Isolation Relay Panel RR-135 (Train A/Non-1E)
9-E-PN01-02	#1	#2	Isolation Relay Panel RR-135 (Train A/Non-1E)
9-E-PN01-03	#1	#2	Isolation Relay Panel RR-136 (Train A/Non-lE)
9-E-PN01-04	#1	#2	Isolation Relay Panel RR-136 (Train A/Non-lE)
9-E-PN02-01	#1	#2	Isolation Relay Panel RR-137 (Train B/Non-lE)
9-E-PN02-02	#1	#2	Isolation Relay Panel RR-137 (Train B/Non-lE)
9-E-PN02-03	#1	#2	Isolation Relay Panel RR-138 (Train B/Non-lE)
9-E-PN02-04	#1	#2	Isolation Relay Panel RR-138 (Train B/Non-lE)
9-E-PN03-01	#1	#2	Isolation Relay Panel RR-139 (Train C/Non-lE)
9-E-PN03-02	#1	#2	Isolation Relay Panel RR-139 (Train C/Non-lE)
9-E-PN03-03	#1	#2	Isolation Relay Panel RR-140 (Train C/Non-lE)
9-E-PN03-04	#1	#2	Isolation Relay Panel RR-140 (Train C/Non-lE)
9-E-PN04-01	#1	#2	Isolation Relay Panel RR-146 (Train A/Train B)
9-E-PN04-02	#1	#2	Isolation Relay Panel RR-146 (Train A/Train B)
9-E-PN05-01	#1	#2	Isolation Relay Panel RR-148 (Train A/Group D)
9-E-PN05-02	#1	#2	Isolation Relay Panel RR-148 (Train A/Group D)
9-E-PN06-01	#1	#2	Isolation Relay Panel RR-147 (Train A/Non-1E)
9-E-PN06-02	#1	#2	Isolation Relay Panel RR-147 (Train A/Non-1E)
9-E-PS01-01	#1	#2	Containment Isolation Valves FVs 4456 and 4466

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-PS02-01	#1	#2	Containment Isolation Valves FVs 4452, 4461, and 4451B
9-E-PS03-01	#1	#2	Containment Isolation Valves FVs 4450, 4450A, 4451, and 4451A
9-E-PS05-01	#1	#2	Reactor Coolant Sample Containment Isolation Valves FVs 4454, 4454A, 4455, and 4455A
9-E-PS06-01	#1	#2	RHR Loops A, B, and C Sample Select Valves FVs 4458, 4459, and 4460
9-E-PS07-01	#1	#2	RHR Sample Containment Isolation Valve FV 4823
9-E-PS08-01	#1	#2	SI Accumulator Sample Containment Isolation Valve FV 4824
9-E-RA0l-01	#1	#2	Containment Isolation Valves MOVs 0001 and 0003
9-E-RA02-01	#1	#2	Containment Isolation Valves MOVs 0004 and 0006
9-E-RC01-01	#1	#2	Reactor Coolant Pump 1A, 1B, 1C, and lD
9-E-RC01-02	#1	#2	Reactor Coolant Pump 1A, 1B, 1C, and 1D
9-E-RC02-01	#1	#2	Reactor Coolant Pressurizer Heater Control Group 1C
9-E-RC02-02	#1	#2	Reactor Coolant Pressurizer Heater Control Group 1C
9-E-RC03-02	#1	#2	Class 1E 15 kV RCP Cubicle 1A
9-E-RC03-03	#1	#2	Class 1E 15 kV RCP Cubicle 1B
9-E-RC03-04	#1	#2	Class 1E 15 kV RCP Cubicle 1C
9-E-RC03-05	#1	#2	Class 1E 15 kV RCP Cubicle 1D
9-E-RC05-01	#1	#2	Reactor Coolant Pressurizer Relief Isolation MOVs 0001A and 0001B
9-E-RC09-01	#1	#2	Reactor Coolant Pump Oil Lift Pumps lA, lB, lC, and 1D (NAP101A, 101B, 101C, and 101D)

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-RC11-01	#1	#2	Reactor Vessel Flange Leak-Off Valve FV 3400
9-E-RC12-01	#1	#2	Reactor Coolant Pressurizer Relief Tank Spray Valve FV 3650 and Drain Valve LV 3655
9-E-RC13-01	#1	#2	Reactor Coolant Pressurizer Power Relief Valves PCVs 0655A and 0656A
9-E-RC14-01	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1A and 1B
9-E-RC14-02	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1A and 1B
9-E-RC14-03	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1A and 1B
9-E-RC15-01	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1D
9-E-RC15-02	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1D and 1E
9-E-RC15-03	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1E
9-E-RC16-01	#1	#2	Reactor Coolant Pressurizer Containment Isolation Solenoid Valve FV 3653
9-E-RC17-01	#1	#2	Reactor Coolant Pressurizer Relief Tank Containment Isolation Valves FVs 3651 and 3652
9-E-RC18-01	#1	#2	Reactor Coolant Pressurizer Spray Valves PCVs 0655B and 0655C
9-E-RC19-01	#1	#2	Reactor Head Vent System Valves HVs 3657A, 3657B, 3658A, and 3658B
9-E-RD01-01	#1	#2	RCVDS Gas Storage Tank Control MOVs 0036 and 0037
9-E-RD02-01	#1	#2	RCVDS Vacuum Pump Package 1A and Compressor Package 1A (PV1O1A and CO102A)
9-E-RH01-01	#1	#2	RHR Pump 1A, 1B, and 1C Mini Flow MOVs 0067A,

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			0067B, and 0067C
9-E-RH02-01	#1	#2	RHR Inlet Isolation MOVs 0061A, 0061B, and 0061C
9-E-RH03-01	#1	#2	RHR Inlet Isolation MOVs 0060A, 0060B, and 0060C
9-E-RH04-01	#1	#2	RHR CVCS Isolation MOVs 0066A and 0066B
9-E-RH05-01	#1	#2	RHR Pumps 1A, 1B, and 1C (PA1O1A-C)
9-E-RH08-01	#1	#2	RHR Heat Exchanger Flow Control HCVs 0864, 0865, and 0866
9-E-RM01-01	#1	#2	Reactor Make-Up Water Pump 1B and 1A
9-E-RM02-01	#1	#2	Reactor Make-Up Water Pump Storage Tank Fill Valve LV 7651
9-E-RM03-01	#1	#2	Reactor Make-Up Water Non-Essential Services Isolation Valves FVs 7659 and 7663
9-E-SB02-01	#1	#2	Steam Generator Blowdown Isolation Valves FVs 4150, 4151, 4152, and 4153
9-E-SB02-02	#1	#2	Steam Generator Blowdown Isolation Valves FYs 4150A, 4151A, 4152A, and 4153A
9-E-SB06-01	#1	#2	Steam Generator Blowdown Isolation Valves FVs 4186, 4187, 4188, and 4189
9-E-SB06-02	#1	#2	Steam Generator Blowdown Sample Isolation Valves FVs 4186A, 4187A, 4188A, and 4189A
9-E-SD01-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13, Air Compressor No. 12, 14, and 16
9-E-SD02-01	#1	#2	Standby Diesel Generator No. 11, 12, and 13 Air Compressor 11, 13, and 15
9-E-SI01-01	#1	#2	HHSI Pump 1A, 1B, 1C Cold Leg Injection MOVs 0006A, 0006B, and 0006C
9-E-SI02-01	#1	#2	Low Head Safety Injection Pump lA, lB, and lC

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			Discharge MOVs 0018A, 0018B, and 0018C
9-E-SI03-01	#1	#2	High Head Safety Injection Pumps 1A, 1B, and lC Hot Leg Injection Isolation MOVs 0008A, 0008B, and 0008C
9-E-SI04-01	#1	#2	Containment Sump Isolation MOVs 0016A, 0016B, and 0016C
9-E-SI05-01	#1	#2	High Head Safety Injection Pumps PA101A, PA101B, and PA101C
9-E-SI06-01	#1	#2	Low Head Safety Injection Pump PA102A, PA102B, and PA102C
9-E-SI07-01	#1	#2	High Head Safety Injection Pump 1A, 1B, and 1C Recirculation MOVs 0011A, 0011B, and 0011C
9-E-SI08-01	#1	#2	High Head Safety Injection Pump 1A, 1B, and 1C Recirculation RWST MOVs 0012A, 0012B, and 0012C
9-E-SI09-01	#1	#2	Low Head Safety Injection Pump 1A, 1B, and 1C Recirculation RWST MOVs 0013A, 0013B, and 0013C
9-E-SI11-01	#1	#2	Low Head Safety Injection Pump 1A, 1B, and lC Recirculation MOVs 0014A, 0014B, and 0014C
9-E-SI12-01	#1	#2	SI RWST Outlet MOVs 000lA, 000lB, and 000lC
9-E-SI13-01	#1	#2	High Head Safety Injection Pumps 1A, 1B, and 1C Discharge MOVs 0004A, 0004B, and 0004C
9-E-SI14-01	#1	#2	Accumulator Discharge Isolation MOVs 0039A, 0039B, and 0039C
9-E-SI14-02	#1	#2	Remotely Operated Breaker Control For Accumulator Discharge Isolation MOVs 0039A, 0039B, and 0039C
9-E-SI15-01	#1	#2	SIS Test Line Containment and Accumulator Nitrogen Isolation Valve FVs 3971 and 3983
9-E-SI16-01	#1	#2	SI RWST SFPCCS Valves FVs 3936 and 3937

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-SI17-01	#1	#2	High Head Safety Injection Pumps 1A, 1B, and 1C Cold Leg Test Line Valves FVs 3952, 3957, and 3962
9-E-SI18-01	#1	#2	High Head Safety Injection Pumps 1A, 1B, and 1C Hot Line Valves FVs 3953, 3958, and 3963
9-E-SI19-01	#1	#2	Hot Leg 1A, 1B, and 1C Test Line Valves FVs 3954, 3959, and 3964
9-E-SI20-01	#1	#2	Accumulator 1A, 1B, and 1C Fill Line Isolation Valves FVs 3873, 3974, and 3975
9-E-SI21-01	#1	#2	Accumulator 1A, 1B, 1C Check Valves Leak Test FVs 3969, 3968, and 3966
9-E-SI22-01	#1	#2	SIS Accumulator Gas Supply and Vent Valves PVs 3930, 3929, and 3928
9-E-SI23-01	#1	#2	Accumulator 1A, 1B, and 1C Check Valves Leak Test FVs 3972, 3967, and 3965
9-E-SI24-01	#1	#2	Accumulator Vent Backup Valve HV-0899
9-E-SI25-01	#1	#2	RHR Heat Exchanger Bypass Control Valves FCVs 0851, 0852, and 0853
9-E-SI26-01	#1	#2	Low Head Safety Injection Pumps 1A, 1B, and 1C Cold Leg Test Line Valves FVs 3950, 3955, and 3960
9-E-SI27-01	#1	#2	Low Head Safety Injection Pumps 1A, 1B, and 1C Hot Leg Test Line Valves FVs 3951, 3956, and 3961
9-E-SI33-01	#1	#2	Low Head Safety Injection Pumps 1A, 1B, and 1C Cold Leg Injection MOVs 0031A, 0031B, and 0031C
9-E-SI34-01	#1	#2	Low Head Safety Injection Pumps 1A, 1B, and lC Hot Leg Injection Isolation Valve MOV 0019Z-C
9-E-SI37-01	#1	#2	SIS Test Line Containment Isolation Valve

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			FV 3970
9-E-SM10-01	#1	#2	Master Block Diagram ESF Status Monitoring System
9-E-SM10-02	#1	#2	Master Block Diagram ESF Status Monitoring System
9-E-SM10-03	#1	#2	Master Block Diagram ESF Status Monitoring System
9-E-SP01-01	#1	#2	Control Room HVAC Emergency Operation Train A
9-E-SP01-02	#1	#2	Control Room HVAC Emergency Operation Train A
9-E-SP02-01	#1	#2	Control Room HVAC Emergency Operation Train B
9-E-SP02-02	#1	#2	Control Room HVAC Emergency Operation Train B
9-E-SP03-01	#1	#2	Control Room HVAC Emergency Operation Train C
9-E-SP03-02	#1	#2	Control Room HVAC Emergency Operation Train C
9-E-SP04-01	#1	#2	FHB HVAC Emergency Operation Train A
9-E-SP05-01	#1	#2	FHB HVAC Emergency Operation Train B
9-E-SP06-01	#1	#2	FHB HVAC Emergency Operation Train C
9-E-SP07-01	#1	#2	Essential Chiller Unit CH001, CH004 Control
9-E-SP08-01	#1	#2	Essential Chiller Unit CH002, CH005 Control
9-E-SP09-01	#1	#2	Essential Chiller Unit CH003, CH006 Control
9-E-WL05-01	#1	#2	Reactor Coolant Drain Tank Pump 1A and 1B (PA107A and PA107B)
9-E-WL06-01	#1	#2	Liquid Waste Miscellaneous Solenoid Valves
9-E-WL07-01	#1	#2	Spent Resin Sluice Pump 1A (PA108A)
9-E-WL07-02	#1	#2	LWPS SRST Sluice Pump Seal Water Valve FV 5011
9-E-WL08-01	#1	#2	LW Spent Resin Storage Tank Transfer Pump 1A (PA104A)

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-WL09-01	#1	#2	LWPS Floor Drain Tank 1A Pump 1A and 1B (PA105A and PA105B)
9-E-WL11-01	#1	#2	Waste Evaporator Condenser Tank Pumps lA and 1B (PA103A and PA103B)
9-E-WL12-01	#1	#2	Waste Holdup Tank Pump 1A (PA102A)
9-E-WL13-01	#1	#2	Laundry and Hot Shower Tank Pump 1A (PA106A)
9-E-WL14-01	#1	#2	Waste Monitor Tank Pumps 1A and 1B (PA104A and PA104B)
9-E-WL14-02	#1	#2	Waste Monitor Tank 1C Pump PA104C
9-E-WL15-01	#1	#2	Liquid Waste Miscellaneous Solenoid Valves
9-E-WL16-01	#1	#2	Liquid Waste Containment Isolation MOV 0312
9-E-WL17-01	#1	#2	Liquid Waste Monitor Tanks 1A, 1B, and 1C Isolation Solenoid Valve
9-E-WL18-01	#1	#2	CPRWCT Pump 1A and LHST Pump 1A Suction Valve FVs 4949 and 4950
9-E-WL19-01	#1	#2	LHST 1A CPRWCT 1A Crossover Valve FV 4951
9-E-WL21-01	#1	#2	Desuperheating Water Metering Pump PA114A
9-E-WL22-01	#1	#2	Waste Evaporation Condensate Tanks Selector Valve FV 4010
9-E-WL23-01	#1	#2	Liquid Waste Steam Condensate Dump Valves FVs 4020 and 4021
9-E-WL24-01	#1	#2	Liquid Waste Discharge Valve FV 4077
9-E-WL25-01	#1	#2	Liquid Waste Miscellaneous Valves FVs 4056 and 4025
9-E-WL26-01	#1	#2	Liquid Waste RCDT Drain and Recirculation Isolation Valves FVs 4903 and 4910

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-WL27-01	#1	#2	RCDT Vent Inside Containment Isolation Valve FV 4920
9-E-WL28-01	#1	#2	RCDT to LWPS and Train B Vent Outside Containment Isolation Valves FVs 4913 and 4919
9-E-WL29-01	#1	#2	Liquid Waste Spent Resin Tank PP Suction and Recirculation Valves FVs 4084 and 4089
9-E-WL30-01	#1	#2	Condensate Pollution Regeneration Waste Cooling Tank Inlet Valve FV 4039
9-E-WL31-01	#1	#2	LWPS Manually Operated Valves
9-E-WL32-01	#1	#2	Waste Evaporator Condensate Tank Block Valve FV 4026
9-E-WL33-01	#1	#2	Laundry and Hot Shower Tank Discharge and Recirculation Valves FVs 4035 and 4035A
9-E-WL34-01	#1	#2	RCDT Level Control Valve LV 4911
9-E-WL35-01	#1	#2	Liquid Waste Spent Resin Transfer Recirculation Valve FVs 4086 and 5021
9-E-WL36-01	#1	#2	Liquid Waste Miscellaneous Valve FV 4907
9-E-WL37-01	#1	#2	LWPS Manually Operated Valves
9-E-WL38-01	#1	#2	Laundry and Hot Shower Tank 1A Chemical Feed Valve FV 4987
9-E-WL39-01	#1	#2	FDT and Waste Hold-up Tank Pump 1A Suction Valves FVs 4957 and 4961
9-E-WL40-01	#1	#2	FDT and Waste Hold-up Tank Pump 1A Recirculation and Discharge Valves
9-E-WL41-01	#1	#2	Waste Hold-Up Tank 1A Chemical Feed Valve FV 5003
9-E-WL42-01	#1	#2	FDT Chemical Feed Valve FV 5002
9-E-WL43-01	#1	#2	CPRWCT Pump 1A Recirculation and Discharge

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			Valves FVs 4046A and 4046
9-E-WL44-01	#1	#2	CPR Waste Collection Tank 1A Chemical Feed Valve FV 4988
9-E-WL45-01	#1	#2	Waste Evaporation Condensate Storage Tank Valve FV 4098
9-E-WL46-01	#1	#2	LWPS Seal-Water Valves FVs 5006 and 5008
9-E-WL47-01	#1	#2	LWPS Seal-Water Valves FVs 5009, 5010, and 5012
9-E-WL48-01	#1	#2	Waste Evaporator Condensate Tanks Outlet Valves FVs 4958 and 4959
9-E-WL49-01	#1	#2	Waste Evaporator Condensate Tanks 1A and 1B Interconnection Valve FV 4960
9-E-WL52-01	#1	#2	LWPS Waste Monitor Tank 1C Isolation Valve FV 4953
9-E-WL53-01	#1	#2	LWPS Waste Monitor Tank B and A Isolation Valves FVs 4952 and 4954
9-E-WL54-01	#1	#2	LWPS Waste Monitor Tank Crossover Valve FVs 4955 and 4956
9-E-WL55-01	#1	#2	Chemical Feed Skid Pump (NXN1O1A)
9-E-WL56-01	#1	#2	LWPS Pumps Discharge Pressure Alarm
9-E-WL57-01	#1	#2	LWPS CPRWCT to FDT Crossover Valve FV 4989
9-E-WL58-01	#1	#2	LWPS Miscellaneous Valves
9-E-WL59-01	#1	#2	LWPS Pressure Alarms For WMT and Surge Tanks
9-E-WL60-01	#1	#2	LWPS CPRW Direct Discharge Valves FVs 5044A and 5044B
9-E-WL61-01	#1	#2	LWPS WECO to WMT Valve FV 5050
9-E-WL62-01	#1	#2	LWPS Miscellaneous Solenoid Valves

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-WL63-01	#1	#2	LWPS Miscellaneous Solenoid Valves
9-E-WL64-01	#1	#2	LWPS Miscellaneous Solenoid Valves
9-E-WL65-01	#1	#2	Liquid Waste Miscellaneous Solenoid Valve
9-E-WL68-01	#1	#2	LWPS Waste Monitor Tank 1D Pump PA104D
9-E-WL69-01	#1	#2	Waste Monitor Tank 1E Pump PA104E
9-E-WL70-01	#1	#2	Waste Monitor Tank 1F Pump PA104F
9-E-WL71-01	#1	#2	Waste Evaporator Condensate Demineralizer To WMT 1D Valve FV 5049
9-E-WL72-01	#1	#2	LWPS WMT 1D and 1F Outlet Valves FVs 5058 and 5068
9-E-WL73-01	#1	#2	LWPS WMT Crossover Valves FVs 5063 and 5069
9-E-WL74-01	#1	#2	Waste Evaporator Condensate Demineralizer to WMT 1E Valve 5053
9-E-WL75-01	#1	#2	Waste Evaporator Condensate Demineralizer to WMT 1F Valve FV 5056
9-E-WL76-01	#1	#2	Surge Tank Pumps 1A and 1B (PA115A and PA115B)
9-E-WL78-01	#1	#2	LWPS Surge Tanks Outlet Valves FVs 5076 and 5088
9-E-WL79-01	#1	#2	Surge Tank PPS Suction Valves FVs 5086 and 5087
9-E-WL80-01	#1	#2	Surge Tank A Inlet Valve FV 5075
9-E-WL80-02	#1	#2	Surge Tank B Inlet Valve FV 5084
9-E-WL81-01	#1	#2	LWPS Low Activity Spent Resin Block Valves FVs 5020 and 5019
9-E-WS01-01	#1	#2	Concentrate Storage Tank Flush Valve FV 4149
9-E-WS02-01	#1	#2	Concentrate Storage Tank Outlet Valve FV 4130

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-WS03-01	#1	#2	Concentrate Storage Tank Inlet Block Valve FV 4125
9-E-WS04-01	#1	#2	Concentrate Storage Tank Pump Flush Valve FV 4137
9-E-WS11-01	#1	#2	Concentrate Storage Tank Pump 1B (PAI04B)
9-E-WS12-01	#1	#2	Concentrate Storage Tank Mixer (NMX101AA)
9-E-WS13-01	#1	#2	Filter Transfer Cart Winch Motor (XH0102A)
9-E-AN02-02	#1	#2	Master Block Diagram NSSS C.B. Demux-Ann Interface
9-E-CM10-01	#1	#2	Master Cable Block Diagram Containment Hydrogen Monitoring System (Panels 153 and 154)
9-E-CV1O-01	#1	#2	Master Block Diagram Chemical and Volume Control System
9-E-CV1O-03	#1	#2	Master Block Diagram Chemical and Volume Control System
9-E-CV1O-04	#1	#2	Master Block Diagram Chemical and Volume Control System
9-E-CV1O-05	#1	#2	Master Block Diagram Chemical and Volume Control System
9-E-CV1O-06	#1	#2	Master Block Diagram Chemical and Volume Control System
9-E-FW12-01	#1	#2	Master Cable Block Diagram SGFPT No. 11 EHC Panel
9-E-FW12-02	#1	#2	Master Cable Block Diagram SGFPT No. 12 EHC Panel
9-E-FW12-03	#1	#2	Master Cable Block Diagram SGFPT No. 13 EHC Panel

TABLE 1.7-1 (Continued)

NONPROPRIETARY
ELECTRICAL ELEMENTARY DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
9-E-HE10-01	#1	#2	Master Block Diagram EAB HVAC System
9-E-MS11-06	#1	#2	Master Block Diagram Main Steam Generator System PORV QDPS Control
9-E-SI29-01	#1	#2	Master Cable Block Diagram Safety Injection System
9-E-XC10-01	#1	#2	Master Block Diagram Containment Personnel, Auxiliary Hatch, and Equipment Hatch
9-E-XC10-02	#1	#2	Containment Personnel Auxiliary Hatch and Equipment Hatch
1-E-CC51-01	N/A	N/A	Elementary Diagram RCFC Chilled Water Return Valves
2-E-CC51-01	N/A	N/A	Elementary Diagram RCFC Chilled Water Return Valves

TABLE 1.7-2

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-Q-11-9-Z-40012	#1	#2	Instrument Air Containment Isolation Valve
5-Q-27-9-Z-40061	#1	#2	Fire Protection Containment Isolation Valve
5-R-27-9-Z-40070	#1	#2	Reactor Makeup Water Pumps
6-R-27-9-Z-40071	#1	#2	Reactor Makeup Water Storage Tank Fill Valve
5-R-27-9-Z-40072	#1	#2	Reactor Makeup Water Non-Essential Services Isolation Valves
5-S-10-9-Z-40076	#1	#2	Main Steam Isolation Valves
5-S-10-9-Z-40077	#1	#2	Steam Dump Valves
5-S-10-9-Z-40078	#1	#2	Main Steam Isolation Bypass Valves
5-S-10-9-Z-40079	#1	#2	Main Steam Line PORVs
5-S-10-9-Z-40083	#1	#2	Steam Dump Valves
5-S-10-9-Z-40084	#1	#2	Steam Dump Valves
5-S-10-9-Z-40086	#1	#2	Main Steam to Deaerator Control Valves
5-S-13-9-Z-40112	#1	#2	Feedwater Control Valve
5-S-13-9-Z-40116	#1	#2	Main Feedwater Isolation Valves
5-S-13-9-Z-40117	#1	#2	Feedwater Bypass Control Valve
5-S-13-9-Z-40119	#1	#2	SG Feed Pump Start Permissives
5-S-13-9-Z-40121	#1	#2	Feedwater Isolation Bypass Valve
5-S-14-9-Z-40131	#1	#2	Motor Driven AFW Pump
5-S-14-9-Z-40132	#1	#2	AFW Turbine Steam Inlet Valve
5-S-14-9-Z-40133	#1	#2	AFW Crossover Valves

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-S-14-9-Z-40134	#1	#2	AFW Crossover Valve
5-S-14-9-Z-40135	#1	#2	AFW Pump 14 Turbine Trip and Throttle Valve
5-S-14-9-Z-40136	#1	#2	AFW Turbine Pump Isolation Valve
5-S-14-9-Z-40139	#1	#2	AFW Pump Turbine Trip Solenoid
5-S-14-9-Z-40140	#1	#2	AFW to SG Regulating Valve
5-S-14-9-Z-40141	#1	#2	AFW Pumps Isolation Valves
5-S-14-9-Z-40142	#1	#2	AFW to SG Regulating Valve
5-S-14-9-Z-40143	#1	#2	AMSAC Interface
5-S-20-9-Z-40203	#1	#2	SG Blowdown Containment Isolation Valves
5-S-20-9-Z-40208	#1	#2	SG Sample Isolation Valves
6-T-08-9-Z-40243	#1	#2	Turbine Trip Control
6-Z-01-9-Z-40400	#1	#2	Reference Logic Diagram: - Switchgear Feeder Breaker Control 13.8 kV Service
6-Z-01-9-Z-40401	#1	#2	Reference Logic Diagram - Switchgear Breaker Control 4.16 kV BOP Service
4-Z-01-9-Z-40402	#1	#2	Reference Logic Diagram - Switchgear Breaker Control 4.16 kV ESF Service
4-Z-01-9-Z-40403	#1	#2	Reference Logic Diagram - Switchgear Breaker Control 480 V Service
6-Z-01-9-Z-40404	#1	#2	Reference Logic Diagram - Switchgear Breaker Control 4.16 kV Makeup Reservoir
4-Z-01-9-Z-40405	#1	#2	Reference Logic Diagram - MCC Starter Control
6-Z-01-9-Z-40406	#1	#2	Reference Logic Diagram - MOV
6-Z-01-9-Z-40407	#1	#2	Reference Logic Diagram - MOV

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-Z-01-9-Z-40408	#1	#2	Reference Logic Diagram - MOV
6-Z-01-9-Z-40409	#1	#2	Reference Logic Diagram - MOV
6-Z-01-9-Z-40410	#1	#2	Reference Logic Diagram - MOV
6-Z-01-9-Z-40411	#1	#2	Reference Logic Diagram - MOV
4-Z-01-9-Z-40412	#1	#2	Reference Logic Diagram - MOV
4-Z-01-9-Z-40413	#1	#2	Reference Logic Diagram - MOV
6-Z-01-9-Z-40414	#1	#2	Reference Logic Diagram - MOV
6-Z-01-9-Z-40415	#1	#2	Reference Logic Diagram - MOV
4-Z-01-9-Z-40416	#1	#2	Reference Logic Diagram - MOV
4-Z-01-9-Z-40417	#1	#2	Reference Logic Diagram - MOV
5-Z-01-9-Z-40418	#1	#2	Standard Logic Symbols
5-Z-01-9-Z-40419	#1	#2	Standard Logic Symbols
5-Z-01-9-Z-40420	#1	#2	Standard Logic Symbols
5-Z-01-9-Z-40421	#1	#2	Standard Logic Symbols
6-Z-01-9-Z-40422	#1	#2	Reference Logic Diagram - Switchgear Breaker Control 480 V Service
6-Z-01-9-Z-40423	#1	#2	Reference Logic Diagram - MCC Starter Control
4-Z-01-9-Z-40445	#1	#2	480 V Load Center E1A, E1B, and E1C Tie Breakers
4-Z-01-9-Z-40446	#1	#2	480 V Load Center E1A, ElB, and ElC Feeder Breaker to MCCs
4-Z-01-9-Z-40453	#1	#2	4.16 kV Bus E1A, E1B, and E1C Feeder Breakers to Load Center Transformers
4-Z-01-9-Z-40461	#1	#2	13.8 kV Buses lF, lG, and lH Supply Breakers from Unit Aux. Transformer

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
4-Z-01-9-Z-40462	#1	#2	13.8 kV Buses 1F, 1G, and 1H Supply Breakers from Unit 1 Standby Transformer
4-Z-01-9-Z-40463	#1	#2	13.8 kV Buses 1F, 1G, and 1H Supply Breakers from Unit 1 Standby Transformer
4-Z-01-9-Z-40464	#1	#2	13.8 kV Buses 1F, 1G, and 1H Power Supply Parallel Alarm
4-Z-01-9-Z-40465	#1	#2	13.8 kV Feeder Breakers to Aux. ESF Transformers
6-Z-01-9-Z-40466	#1	#2	13.8 kV Emergency Feeder Breakers to Aux. ESF Transformers
4-Z-01-9-Z-40467	#1	#2	13.8 kV Feeder Breakers to Aux. BOP Transformers
4-Z-01-9-Z-40468	#1	#2	13.8 kV Bus lJ Power Supply Parallel Alarm
4-Z-01-9-Z-40469	#1	#2	13.8 kV Bus 1J Supply Breaker from Unit Aux. Transformer P-150
4-Z-01-9-Z-40470	#1	#2	13.8 kV Bus IJ Supply Breaker from Standby Transformer
6-Z-01-0-Z-40471	N/A	N/A	13.8 kV Circuit Switcher and Ground Switch
6-Z-01-9-Z-40472	#1	#2	13.8 kV Emergency Bus Supply Breaker
5-S-13-9-Z-40482	#1	#2	SG Feedwater Pump Turbine Customer Trips
5-S-13-9-Z-40483	#1	#2	Startup Steam Generator Feed Pump
5-S-13-9-Z-40486	#1	#2	Steam Generator Preheater Bypass Control
5-Z-16-9-Z-41500	#1	#2	Containment Hydrogen Monitoring Train A Sample Select Valves
5-Z-16-9-Z-41501	#1	#2	Containment Hydrogen Monitoring Train C Sample Select Valves
5-Z-16-9-Z-41502	#1	#2	Containment Hydrogen Monitoring Isolation Valves
5-Z-32-9-Z-41509	#1	#2	Sample System Containment Isolation Valve

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-Z-16-9-Z-41512	#1	#2	Containment Hydrogen Monitoring System
5-Z-16-9-Z-41513	#1	#2	Containment Hydrogen Monitoring Isolation Valves
5-Z-32-9-Z-41514	#1	#2	Primary Sampling System RHR Sample Select Valves
5-Z-32-9-Z-41515	#1	#2	Primary Sampling System RHR Sample Containment Isolation Valve
5-Z-32-9-Z-41516	#1	#2	Primary Sampling System Pressurizer Sample Containment Isolation Valve
5-Z-32-9-Z-41517	#1	#2	Primary Sampling System SI Accumulator Sample Containment Isolation Valve
5-Z-32-9-Z-41518	#1	#2	Primary Sampling System Reactor Coolant Sample Containment Isolation Valves
6-V-10-9-Z-41550	#1	#2	MAB HVAC Main Supply Fans and Outlet Dampers
5-V-10-9-Z-41553	#1	#2	MAB HVAC Pumps and Cubicle Coolers Fans
5-V-10-9-Z-41554	#1	#2	MAB HVAC Pumps and Cubicle Cooler Fans
6-V-10-9-Z-41555	#1	#2	MAB HVAC Chilled Water Pumps
6-V-10-9-Z-41557	#1	#2	MAB HVAC Chillers
6-V-10-9-Z-41558	#1	#2	MAB HVAC Cooling Coils
6-V-10-9-Z-41559	#1	#2	MAB HVAC Water Chiller Flow Control
6-V-10-9-Z-41563	#1	#2	MAB HVAC Supply Systems A and B Isolation Dampers
5-V-11-9-Z-41570	#1	#2	Essential HVAC Chilled Water Pumps
5-V-11-9-Z-41571	#1	#2	Control Room HVAC Makeup Air Fans
5-V-11-9-Z-41572	#1	#2	EAB HVAC Supply Air Fans
5-V-11-9-Z-41573	#1	#2	EAB HVAC Exhaust Air Fans (Battery Room)

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-V-11-9-Z-41574	#1	#2	Control Room Return Air Fans
5-V-11-9-Z-41575	#1	#2	Control Room HVAC Clean-up Air Fans
5-V-11-9-Z-41581	#1	#2	EAB HVAC Supply Air Handling Units Outlet Dampers
5-V-11-9-Z-41587	#1	#2	Control Room Makeup Air Filters Inlet Damper
5-V-11-9-Z-41592	#1	#2	EAB Main Area and Control Room Essential Chilled Water Cooling Coils
5-V-11-9-Z-41593	#1	#2	Essential HVAC Chilled Water Chillers
5-V-11-9-Z-41594	#1	#2	Control Room Supply Air Handling Fans
5-V-11-9-Z-41595	#1	#2	Control Room Clean-up Unit Filter Return Air Damper
5-V-11-9-Z-41596	#1	#2	Control Room HVAC Smoke Purge
5-V-11-9-Z-41597	#1	#2	Control Room Envelope HVAC Isolation Damper
5-V-11-9-Z-41598	#1	#2	Control Room Envelope HVAC Return Air Dampers
6-V-11-9-Z-41599	#1	#2	Control Room HVAC Kitchen Toilet Exhaust Fan
6-V-12-9-Z-41600	#1	#2	FHB HVAC Main Supply Fans
5-V-12-9-Z-41601	#1	#2	FHB HVAC Main Exhaust Fans
5-V-12-9-Z-41602	#1	#2	FHB HVAC Exhaust Booster Fans

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-V-12-9-Z-41603	#1	#2	FHB HVAC Supply Subsystem Isolation Dampers
5-V-12-9-Z-41608	#1	#2	FHB HVAC Exhaust Filter Outlet Damper
5-V-12-9-Z-41609	#1	#2	FHB HVAC Exhaust Filter Inlet Damper
6-V-12-9-Z-41613	#1	#2	FHB HVAC Supply System Cooling Coils Chilled Water
5-V-12-9-Z-41614	#1	#2	FHB HVAC LHSI/HHSI/CSS Pump Supplementary Cooler Fans
6-V-12-9-Z-41615	#1	#2	FHB HVAC Elevator #6 Machine Room
5-V-12-9-Z-41617	#1	#2	FHB HVAC Exhaust Air Bypass Line Damper
5-V-12-9-Z-41618	#1	#2	FHB HVAC Relief Supply Dampers
6-V-12-9-Z-41619	#1	#2	FHB HVAC Differential Pressure Control Modulating Damper
6-V-13-9-Z-41620	#1	#2	DGB HVAC Oil Tank Room Exhaust Fans
5-V-13-9-Z-41621	#1	#2	DGB HVAC Emergency Vent Fans
5-V-13-9-Z-41622	#1	#2	DGB HVAC Modulating Dampers
6-V-13-9-Z-41623	#1	#2	DGB HVAC Normal Ventilation Fan
5-V-14-9-Z-41630	#1	#2	RCB HVAC RCFC Supply Fans
6-V-14-9-Z-41632	#1	#2	RCB HVAC Containment Carbon Fans
5-V-14-9-Z-41634	#1	#2	Main Steam Isolation Valve Cubicle Vent Fans
6-V-14-9-Z-41635	#1	#2	RCB HVAC Normal Containment Purge Supply Fans
6-V-14-9-Z-41636	#1	#2	RCB HVAC Supplementary Containment Purge Supply and Exhaust Fans
6-V-14-9-Z-41637	#1	#2	RCB HVAC CRDM Vent Fans

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-V-14-9-Z-41638	#1	#2	RCB HVAC Reactor Cavity Vent Fans
6-V-14-9-Z-41641	#1	#2	RCB HVAC Containment Tendon Gallery Tunnel Support Exhaust Fan
6-V-14-9-Z-41642	#1	#2	RCB HVAC Containment Penetration Isolation Valve Overload Alarm
6-V-14-9-Z-41643	#1	#2	RCB HVAC Normal Containment Purge Exhaust Fans
5-V-14-9-Z-41644	#1	#2	RCB HVAC Supplementary Containment Purge Isolation Valves
6-V-14-9-Z-41647	#1	#2	RCB HVAC Normal Containment Purge Supply Modulating Damper
5-V-14-9-Z-41648	#1	#2	RCB HVAC Normal Containment Purge Containment Isolation Valves
6-V-14-9-Z-41649	#1	#2	RCB HVAC Supplementary Containment Purge Supply Control Dampers
6-V-14-9-Z-41653	#1	#2	RCB HVAC Water Chiller Flow Control
6-V-14-9-Z-41654	#1	#2	RCB HVAC Chilled Water Pumps
6-V-14-9-Z-41655	#1	#2	RCB HVAC Chillers
5-V-14-9-Z-41657	#1	#2	RCB HVAC Containment Cubicles Exhaust Fans
6-V-14-9-Z-41658	#1	#2	RCB HVAC Supplementary Purge Supply Heating Coil MCC
6-V-14-9-Z-41659	#1	#2	RCB HVAC Normal Purge Supply Heating Coils
6-V-14-9-Z-41660	#1	#2	RCB HVAC Elevator Machine Room Vent Fan
5-V-15-9-Z-41674	#1	#2	ECW Pump Cubicle HVAC Ventilation Fan
5-V-15-9-Z-41675	#1	#2	ECW Pump Cubicle HVAC Vent Fans Intake and Exhaust Dampers

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-V-11-9-Z-41700	#1	#2	EAB HVAC Main Area Smoke Purge Dampers
5-V-11-9-Z-41702	#1	#2	Control Room Envelope HVAC Fire Protection Damper
5-V-11-9-Z-41703	#1	#2	EAB Return Air Fans
6-V-11-9-Z-41704	#1	#2	EAB Reheat Coil
4-V-11-9-Z-41705	#1	#2	Trains A, B, C Battery Room Heater
5-V-11-9-Z-41706	#1	#2	Control Room HVAC Makeup Flow Control Damper
5-V-11-9-Z-41707	#1	#2	Control Room Envelope Outside Air Makeup Unit Heating Coil
5-V-11-9-Z-41708	#1	#2	EAB Main AHU Heating Coil
6-V-11-9-Z-41711	#1	#2	Technical Support Center (TSC) Chilled Water Pumps
6-V-11-9-Z-41712	#1	#2	Technical Support Center (TSC) Chiller
8-V-11-9-Z-41713	#1	#2	Technical Support Center (TSC) Equipment Room Vent Fans and Dampers
8-V-11-9-Z-41714	#1	#2	Technical Support Center (TSC) Men/Women Toilet/Break Room Exhaust Fan and Damper
8-V-11-9-Z-41715	#1	#2	Technical Support Center (TSC) Reheat Coils
8-V-11-9-Z-41716	#1	#2	TSC HVAC Return Air Dampers
8-V-11-9-Z-41718	#1	#2	Technical Support Center (TSC) Makeup Air Carbon Filter Outlet Damper
8-V-11-9-Z-41719	#1	#2	Technical Support Center (TSC) HVAC Supply Air Fans
8-V-11-9-Z-41722	#1	#2	Technical Support Center (TSC) HVAC Smoke Purge Air Dampers
8-V-11-9-Z-41723	#1	#2	Technical Support Center (TSC) HVAC Return Air

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			Fans
5-V-11-9-Z-41724	#1	#2	EAB Penetration Space HVAC Subsystem Emergency Fan
6-V-11-9-Z-41725	#1	#2	EAB HVAC Penetration Space Normal AHU Fan
6-V-11-9-Z-41726	#1	#2	EAB HVAC Penetration Space Exhaust Fan
5-V-12-9-Z-41740	#1	#2	FHB HVAC Spent Fuel Pump Room Supplementary Cooler
5-V-12-9-Z-41741	#1	#2	FHB HVAC Supplementary Cooler for Containment Sump Isolation Valve Cubicle
6-V-12-9-Z-41742	#1	#2	FHB HVAC Supply Heating Coil
6-V-12-9-Z-41744	#1	#2	HVAC FHB Exhaust Filter Unit Common Alarm
6-V-12-9-Z-41746	#1	#2	FHB HVAC Supply System Cooling Coils Shutoff Valves
6-V-10-9-Z-41751	#1	#2	MAB HVAC Supply Heating Coil
6-V-10-9-Z-41752	#1	#2	HVAC MAB EAB Makeup Air from MAB
6-V-10-9-Z-41754	#1	#2	MAB HVAC Cubicle Cooler Fans
6-V-11-9-Z-41761	#1	#2	Technical Support Center (TSC) Makeup Air Fan
6-V-11-9-Z-41764	#1	#2	Technical Support Center (TSC) Makeup Heating Coil
6-V-11-9-Z-41765	#1	#2	HVAC EAB and Control Room Outside Makeup Common Alarm
6-V-11-9-Z-41766	#1	#2	HVAC Control Room Cleanup Unit Common Alarm
6-V-11-9-Z-41767	#1	#2	Technical Support Center (TSC) HVAC Supply Air Damper
6-V-11-9-Z-41768	#1	#2	TSC Computer Room Air Handling Unit

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-V-11-9-Z-41769	#1	#2	TSC Computer Room AHU Inlet Valve
5-V-11-9-Z-41770	#1	#2	HVAC EAB and Control Room Outside Air Reheat Coil
6-V-11-9-Z-41772	#1	#2	EAB Computer Room Air Handling Unit
6-V-11-9-Z-41773	#1	#2	EAB Computer Room AHU Inlet Valves
6-V-14-9-Z-41781	#1	#2	MSIV Cubicle Penetrations and Restraints Vent Fans
6-V-11-9-Z-41785	#1	#2	480 V Load Center lW Supply Breaker
6-V-11-9-Z-41786	#1	#2	480 V Load Center 1W TSC Diesel Generator Feeder Breaker
7-Z-26-9-Z-41800	#1	#2	ECW ESF Status Monitoring Train A
7-Z-26-9-Z-41801	#1	#2	Motor Driven Aux. Feedwater ESF Status Monitoring Train A
7-Z-26-9-Z-41802	#1	#2	Turbine Driven Aux. Feedwater ESF Status Monitoring Train A
7-Z-26-9-Z-41803	#1	#2	Electrical Penetrations Space HVAC ESF Status Monitoring Train A
7-Z-26-9-Z-41804	#1	#2	Uninterruptible Power Supply Channel I ESF Status Monitoring Train A
7-Z-26-9-Z-41805	#1	#2	Uninterruptible Power Supply Channel II ESF Status Monitoring Train A
7-Z-26-9-Z-41806	#1	#2	FHB Exhaust HVAC ESF Status Monitoring Train A
7-Z-26-9-Z-41807	#1	#2	Containment Spray ESF Status Monitoring Train A
7-Z-26-9-Z-41808	#1	#2	ESF Diesel Generator 11 ESF Status Monitoring Train A
7-Z-26-9-Z-41809	#1	#2	Combustible Gas Control System ESF Status Monitoring Train A

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
7-Z-26-9-Z-41810	#1	#2	Emergency Core Cooling ESF Status Monitoring Train A
7-Z-26-9-Z-41811	#1	#2	Emergency Core Cooling ESF Status Monitoring Train A
7-Z-26-9-Z-41812	#1	#2	Emergency Core Cooling ESF Status Monitoring Train A
7-Z-26-9-Z-41813	#1	#2	Emergency Core Cooling SI/Auto Recirculation ESF Monitoring Train A
7-Z-26-9-Z-41814	#1	#2	Component Cooling Water ESF Status Monitoring Train A
7-Z-26-9-Z-41815	#1	#2	Containment Heat Removal ESF Status Monitoring Train A
7-Z-26-9-Z-41816	#1	#2	Containment Heat Removal ESF Status Monitoring Train A
7-Z-26-9-Z-41817	#1	#2	Control Room Envelope/EAB Main Area HVAC ESF Status Monitoring Train A
7-Z-26-9-Z-41818	#1	#2	Feedwater Isolation ESF Status Monitoring Trains A and B
7-Z-26-9-Z-41819	#1	#2	Steamline Isolation ESF Status Monitoring Trains A and B
7-Z-26-9-Z-41820	#1	#2	Containment Isolation Phase A ESF Status Monitoring Train A
7-Z-26-9-Z-41821	#1	#2	Containment Isolation Phase A ESF Status Monitoring Train A
7-Z-26-9-Z-41823	#1	#2	Containment Ventilation Isolation ESF Status Monitoring Train A
7-Z-26-9-Z-41824	#1	#2	Containment Isolation Phase A ESF Status Monitoring Train A
7-Z-26-9-Z-41825	#1	#2	ESF Status Monitoring Interface Train A

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
7-Z-26-9-Z-41826	#1	#2	Feedwater Isolation ESF Status Monitoring Trains A and B
7-Z-26-9-Z-41827	#1	#2	Feedwater Isolation ESF Status Monitoring Trains A and B
7-Z-26-9-Z-41829	#1	#2	ESF Diesel Generator 11 ESF Status Monitoring Train A
7-Z-26-9-Z-41830	#1	#2	Essential Cooling Water ESF Status Monitoring Train A
7-Z-26-9-Z-41832	#1	#2	ESF Diesel Generator 11 ESF Status Monitoring Train A
7-Z-26-9-Z-41833	#1	#2	ESF Diesel Generator 11 ESF Status Monitoring Train A
7-Z-26-9-Z-41834	#1	#2	Emergency Core Cooling ESF Status Monitoring Train A
7-Z-26-9-Z-41835	#1	#2	Control Room Envelope/EAB Main Area HVAC ESF Status Monitoring Train A
5-Z-54-9-Z-41894	#1	#2	Post Accident Sampling System Containment Isolation Valves
7-Z-26-9-Z-41895	#1	#2	SSPS and ESF Actuation System ESF Status Monitoring
5-Z-54-9-Z-41896	#1	#2	Post Accident Sampling System Containment Isolation Valves
7-Z-26-9-Z-41897	#1	#2	Process Systems Transfer Switches Bypass/ Inoperable Status Monitoring Train A
7-Z-14-9-Z-41900	#1	#2	Radiation Monitoring System Computer Interface
5-V-14-1-Z-41782	N/A	N/A	RCB HVAC Supplementary Containment Purge Isolation Valves
5-V-14-2-Z-41782	N/A	N/A	RCB HVAC Supplementary Containment Purge Isolation Valves

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-Z-14-9-Z-41901	#1	#2	Control Room/EAB Radiation Monitoring System
5-Z-14-9-Z-41903	#1	#2	Spent Fuel Pool Exhaust Radiation Monitoring System
5-Z-14-9-Z-41906	#1	#2	RCB Purge Isolation Radiation Monitoring System
7-Z-14-9-Z-41909	#1	#2	Gaseous Waste Processing System
7-Z-14-9-Z-41910	#1	#2	Liquid Radiation Monitoring System
5-Z-14-9-Z-41911	#1	#2	Containment Isolation Valves
7-Z-26-9-Z-41913	#1	#2	Essential Chilled Water System ESF Status Monitoring Train A
7-Z-26-9-Z-41916	#1	#2	HVAC Transfer Switches Bypass/Inoperable Status Monitoring Train A
7-Z-26-9-Z-41919	#1	#2	Containment Ventilation Isolation ESF Status Monitoring Train A
7-Z-26-9-Z-41922	#1	#2	Control Room Envelope/EAB Main Area HVAC ESF Status Monitoring Train A
5-Z-54-9-Z-41925	#1	#2	Post Accident Sampling System Containment Isolation Valves
5-N-12-9-Z-42000	#1	#2	HHSI and LHSI Pumps
5-N-12-9-Z-42001	#1	#2	Containment Sump Isolation Valves
5-N-12-9-Z-42002	#1	#2	Normally Open SI Pump Recirculation Valves
5-N-12-9-Z-42003	#1	#2	SIS Cold Leg Injection Valves
5-N-12-9-Z-42004	#1	#2	SI RWST Outlet Valves
5-N-12-9-Z-42005	#1	#2	SIS Hot Leg Injection Isolation Valves
5-N-12-9-Z-42006	#1	#2	HHSI and LHSI Pump Discharge Valves
5-N-12-9-Z-42008	#1	#2	SI RWST to SFPCCS Valves

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-N-12-9-Z-42009	#1	#2	Accumulator Nitrogen and SIS Test Line Containment Isolation Valves
5-N-12-9-Z-42010	#1	#2	SIS Test Line and Accumulator Fill Line Valves
5-N-12-9-Z-42011	#1	#2	Accumulator Nitrogen/Vent Isolation Valve
7-N-12-9-Z-42013	#1	#2	SI/RHR Alarm Logic Train A
7-N-12-9-Z-42014	#1	#2	SI/RHR Alarm Logic Train B
7-N-12-9-Z-42015	#1	#2	SI/RHR Alarm Logic Train C
7-N-12-9-Z-42016	#1	#2	SI Bypass Status Inoperative Train A
7-N-12-9-Z-42017	#1	#2	SI Bypass Status Inoperative Train B
7-N-12-9-Z-42018	#1	#2	SI Bypass Status Inoperative Train C
4-N-12-9-Z-42024	#1	#2	Accumulator Vent Backup Valve
5-N-12-9-Z-42025	#1	#2	SIS Accumulator Gas Supply and Vent Valves
5-N-12-9-Z-42027	#1	#2	Accumulator Discharge Isolation Valves Annunciator Input
5-N-12-9-Z-42028	#1	#2	Accumulator Discharge Isolation Valves
5-N-12-9-Z-42029	#1	#2	Accumulator Discharge Isolation Valves
5-N-12-9-Z-42030	#1	#2	RHR Heat Exchanger Bypass Control Valves
6-R-18-9-Z-42032	#1	#2	Recycle Evaporator Feed Pumps
6-R-18-9-Z-42033	#1	#2	Boron Recycle Evaporator Discharge Diversion Valve
6-R-18-9-Z-42034	#1	#2	Recycle Evaporator Feed Demineralizer Diversion Valve
6-R-18-9-Z-42035	#1	#2	Recycle Holdup Tanks Vent Header Isolation Valve
5-R-20-9-Z-42040	#1	#2	Component Cooling Water Pumps

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-R-20-9-Z-42041	#1	#2	RCFC Chilled Water Supply and Return Valves
5-R-20-9-Z-42042	#1	#2	RCFC CCW Supply and Return Valves
5-R-20-9-Z-42043	#1	#2	CCW RCFC Inlet and Outlet MOVs
5-R-20-9-Z-42044	#1	#2	CCW Common Header Isolation Valves
5-R-20-9-Z-42045	#1	#2	CCW Common Loads Isolation Valves
5-R-20-9-Z-42046	#1	#2	CCW Containment Isolation Valves
6-R-20-9-Z-42047	#1	#2	RCP Thermal Barrier CCW Discharge Valves
5-R-20-9-Z-42049	#1	#2	CCW RHR Containment Isolation Valves
6-R-20-9-Z-42050	#1	#2	CCW MOV Overload Alarm Train A
5-R-20-9-Z-42051	#1	#2	CCW RHR/RCFC Containment Isolation Valves
5-R-20-9-Z-42052	#1	#2	CCW RCP Containment Inside Isolation Valves
5-R-20-9-Z-42053	#1	#2	RCDT and Excess Letdown HX Isolation Valves
5-R-20-9-Z-42054	#1	#2	RCDT HX Isolation Valve
5-R-20-9-Z-42055	#1	#2	CCW HX Throttle and Bypass Valves
6-R-20-9-Z-42056	#1	#2	CCW Surge Tank Valve
6-R-20-9-Z-42057	#1	#2	CCW Radiation Monitor Inlet Valves
5-R-20-9-Z-42058	#1	#2	CCW Discharge from RHR HX Valves
5-R-20-9-Z-42059	#1	#2	CCW RCP Containment Outside Isolation Valve
6-R-20-9-Z-42060	#1	#2	Letdown HX CCW Valve
5-R-20-9-Z-42061	#1	#2	CCW ECW Standby Train Start
5-R-20-9-Z-42062	#1	#2	CCW ECW Train Selector Alarm
5-R-20-9-Z-42063	#1	#2	CCW/RHR Alarms and Bypass Status Inoperable

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-R-20-9-Z-42064	#1	#2	CCW to Charging Pumps Supply and Return Valves
5-R-20-9-Z-42065	#1	#2	CCW to Charging Pumps Supply and Return Valves
5-R-20-9-Z-42066	#1	#2	CCW to Centrifugal Charging Pumps Cross Connect Supply and Return Valves
5-R-20-9-Z-42067	#1	#2	CCW to Post Accident Sampling System Isolation Valves
5-R-28-9-Z-42077	#1	#2	Essential Cooling Water Pumps
5-R-28-9-Z-42078	#1	#2	ECW Screen Wash Booster Pumps
5-R-28-9-Z-42079	#1	#2	ECW Traveling Water Screens
5-R-28-9-Z-42080	#1	#2	ECW Self Cleaning Strainer
5-R-28-9-Z-42081	#1	#2	ECW Pump Discharge Valves
5-R-28-9-Z-42082	#1	#2	ECW Screen Wash Valves
5-R-28-9-Z-42083	#1	#2	ECW Blowdown Isolation Valves
5-Q-15-9-Z-42090	#1	#2	Standby DG Standby Jacket Water Pump
5-Q-15-9-Z-42091	#1	#2	Standby DG Jacket Water Circulation Pump
4-Q-15-9-Z-42092	#1	#2	Standby DG Standby Jacket Water Heater
5-Q-15-9-Z-42094	#1	#2	Standby DG Lube Oil Circulation Pump
4-Q-15-9-Z-42095	#1	#2	Standby DG Lube Oil Heater
5-Q-15-9-Z-42096	#1	#2	Standby DG Standby Lube Oil Pump
6-Q-15-9-Z-42097	#1	#2	Standby DG Standby Fuel Oil Pump
5-Q-15-9-Z-42098	#1	#2	Standby DG Fuel Oil Transfer (Drip) Pump
6-Q-15-9-Z-42099	#1	#2	Standby DG Air Compressor
5-Q-15-9-Z-42100	#1	#2	Standby Diesel Generators

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-Z-10-9-Z-42110	#1	#2	Reactor Trip Breaker
5-Z-10-9-Z-42111	#1	#2	Reactor Trip Signals
5-Z-10-9-Z-42112	#1	#2	SSPS Logic Train R and S
5-Z-10-9-Z-42113	#1	#2	Actuation Trains A, B, and C
5-Z-10-9-Z-42114	#1	#2	Actuation Trains A, B, and C
5-Z-10-9-Z-42115	#1	#2	Actuation Trains A, B, and C
5-Z-10-9-Z-42116	#1	#2	Feedwater Isolation and Turbine Trip Actuation Trains A and B
5-Z-10-9-Z-42117	#1	#2	ESF Load Sequencer Actuation Train A
5-Z-10-9-Z-42118	#1	#2	ESF Load Sequencer Actuation Train B
5-Z-10-9-Z-42119	#1	#2	ESF Load Sequencer Actuation Train C
5-Z-10-9-Z-42121	#1	#2	Standby DG 4.16 kV Feeder Breaker
5-Z-10-9-Z-42122	#1	#2	ESF Bus 4.16 kV Supply Breaker
5-Z-10-9-Z-42123	#1	#2	Actuation Train A, B, and C, Miscellaneous
5-Z-10-9-Z-42124	#1	#2	Control Room HVAC Emergency Operation
5-Z-10-9-Z-42125	#1	#2	FHB HVAC Emergency Operation
5-Z-10-9-Z-42126	#1	#2	480 V ESF Load Center Incoming Breaker
5-Z-10-9-Z-42127	#1	#2	4.16 kV ESF Bus Undervoltage Control and Alarm
5-Z-10-9-Z-42128	#1	#2	Rod Control, Miscellaneous
5-N-10-9-Z-42130	#1	#2	Containment Spray Pumps
5-N-10-9-Z-43132	#1	#2	Containment Spray Pump MOV
5-R-21-9-Z-42140	#1	#2	Spent Fuel Pool Cooling Pump

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-R-21-9-Z-42141	#1	#2	Spent Fuel Refueling Water Purification Pump
6-R-21-9-Z-42142	#1	#2	Spent Fuel Pool Skimmer Pump
6-G-06-0-Z-42145	N/A	N/A	Miscellaneous Sump Pump
5-R-14-9-Z-42150	#1	#2	Reactor Coolant Pumps
5-R-14-9-Z-42151	#1	#2	Reactor Coolant Pressurizer Heater Backup Group 1A and 1B
6-R-14-9-Z-42152	#1	#2	Reactor Coolant Pressurizer Heater Control Group 1C
6-R-14-9-Z-42153	#1	#2	Reactor Coolant Pressurizer Heater Backup Groups 1D and 1E
6-R-14-9-Z-42154	#1	#2	Reactor Coolant Pump Oil Lift Pumps
5-R-14-9-Z-42155	#1	#2	Reactor Coolant Pressurizer Relief Isolation Valves
6-R-14-9-Z-42156	#1	#2	Reactor Coolant Pressurizer Relief Tank Remote Operated Valves
5-R-14-9-Z-42157	#1	#2	Reactor Coolant Pressurizer Relief Tank Containment Isolation Valves
5-R-14-9-Z-42158	#1	#2	Reactor Coolant Pressurizer Containment Isolation Solenoid Valve
6-R-14-9-Z-42159	#1	#2	Reactor Coolant Pressurizer Spray Valves
5-R-14-9-Z-42160	#1	#2	Reactor Coolant Pressurizer Power Relief Valves
6-R-14-9-Z-42161	#1	#2	Reactor Vessel Flange Leak-Off Valve
5-R-14-9-Z-42163	#1	#2	Reactor Head Vent System Valves
5-R-16-9-Z-42180	#1	#2	Residual Heat Removal Pumps
5-R-16-9-Z-42181	#1	#2	RHR CVCS Isolation Valves
5-R-16-9-Z-42182	#1	#2	RHR Inlet Isolation Valves

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-R-16-9-Z-42183	#1	#2	RHR Heat Exchanger Flow Control Valves
6-R-16-9-Z-42185	#1	#2	RHR Pump Miniflow Valves
6-R-30-9-Z-42250	#1	#2	Reactor Coolant Drain Tank Pumps
6-R-30-9-Z-42251	#1	#2	Waste Hold-up Tank Pump
6-R-30-9-Z-42252	#1	#2	Laundry and Hot Shower Tank Pump
6-R-30-9-Z-42253	#1	#2	Floor Drain Tank Pump
6-R-30-9-Z-42254	#1	#2	Waste Monitor Tank No. A Pump
6-R-30-9-Z-42255	#1	#2	Waste Monitor Tank No. B Pump
6-R-30-9-Z-42256	#1	#2	Waste Monitor Tank No. C Pump
6-R-30-9-Z-42257	#1	#2	Spent Resin Sluice Pump
6-R-30-9-Z-42259	#1	#2	Liquid Waste Spent Resin Storage Tank Transfer Pump
6-R-30-9-Z-42261	#1	#2	Waste Evaporator Condensate Tank Pumps
5-R-30-9-Z-42262	#1	#2	Liquid Waste Containment Isolation Valve
6-R-30-9-Z-42263	#1	#2	Waste Evaporator Condensate Tank Selector Valve
6-R-30-9-Z-42264	#1	#2	Liquid Waste Steam Condensate Pump Valves
6-R-30-9-Z-42265	#1	#2	Liquid Waste Discharge Valve
6-R-30-9-Z-42266	#1	#2	Liquid Waste Miscellaneous Valves
6-R-30-9-Z-42267	#1	#2	Liquid Waste Monitor Tank No. A Isolation Valves
6-R-30-9-Z-42268	#1	#2	Liquid Waste Monitor Tank No. B Isolation Valve
6-R-30-9-Z-42269	#1	#2	Liquid Waste Monitor Tank No. C Isolation Valve
6-R-30-9-Z-42270	#1	#2	Liquid Waste RCDT Drain and Recirculation

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
			Isolation Valve
5-R-30-9-Z-42271	#1	#2	Liquid Waste Train A RCDT Vent Containment Isolation Valve
5-R-30-9-Z-42272	#1	#2	RCDT to LWPS and RCDT Vent Containment Isolation Valve
6-R-30-9-Z-42273	#1	#2	Liquid Waste Spent Resin Tank Pump Suction and Recirculation Valves
6-R-30-9-Z-42276	#1	#2	Condensate Polishing Regeneration Waste Collection Tank Inlet Valve
6-R-30-9-Z-42277	#1	#2	LWPS Manually Operated Valves
6-R-30-9-Z-42278	#1	#2	Waste Evaporator Condensate Block Valve
6-R-30-9-Z-42279	#1	#2	Laundry and Hot Shower Tank Discharge and Recirculation Valves
6-R-30-9-Z-42280	#1	#2	Liquid Waste Miscellaneous Valves
6-R-30-9-Z-42281	#1	#2	RCDT Level Control Valve
6-R-30-9-Z-42282	#1	#2	RCDT Nitrogen Outlet Control Valve
6-R-30-9-Z-42283	#1	#2	Spent Resin Transfer Pump Recirculation Valve
6-R-30-9-Z-42284	#1	#2	Desuperheating Water Metering Pump System
6-R-30-9-Z-42285	#1	#2	LWPS Evaporating Steam Pressure Reducing Valve
6-R-30-9-Z-42286	#1	#2	Waste Holdup Tank 1A Control Valves
6-R-30-9-Z-42287	#1	#2	Floor Drain Tank lA Control Valves
6-R-30-9-Z-42288	#1	#2	Condensate Polishing Regeneration Waste Collection Tank Valves
6-R-30-9-Z-42289	#1	#2	LHST Chemical Feed Valve Pump Suction Valves
6-R-30-9-Z-42290	#1	#2	Waste Evaporator Condensate Tanks Isolation Valves

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-R-30-9-Z-42291	#1	#2	Waste Monitor Tanks Isolation Valves
6-R-30-9-Z-42292	#1	#2	LWPS Seal Water Valves
6-R-30-9-Z-42293	#1	#2	Chemical Feed Pump
6-R-30-9-Z-42294	#1	#2	LWPS Pumps Discharge Pressure Alarm
6-R-30-9-Z-42295	#1	#2	Condensate Polishing Regeneration Waste to LWPS Floor Drain Tank lA Valve
6-R-30-9-Z-42296	#1	#2	Liquid Waste Processing System Miscellaneous Normally Closed Valves
6-R-30-9-Z-42297	#1	#2	Waste Evaporator Condensate Demineralizer to Waste Monitor Tanks D, E, and F
6-R-30-9-Z-42298	#1	#2	Condensate Polishing Regneration Waste Direct Discharge Valves
6-R-30-9-Z-42299	#1	#2	Waste Monitor Tank D
6-R-34-9-Z-42300	#1	#2	RCVDS Gas Storage Tank Control
6-R-34-9-Z-42301	#1	#2	RCVDS Vacuum Pump Package
6-R-34-9-Z-42302	#1	#2	RCVDS Compressor Pump Package
6-R-30-9-Z-42303	#1	#2	Surge Tank Pumps and Valves
6-R-30-9-Z-42304	#1	#2	Liquid Waste Processing System Miscellaneous Normally Open Valves
6-R-30-9-Z-42305	#1	#2	Waste Monitor Tank E
6-R-30-9-Z-42306	#1	#2	Waste Monitor Tank F
6-R-30-9-Z-42307	#1	#2	Pressure Alarms for Waste Monitor Tanks D, E, and F, and Surge Tanks A and B
5-Q-06-9-Z-42317	#1	#2	Radioactive Equipment and Floor Drain Sump Inside Containment Isolation Valve

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
5-Q-06-9-Z-42318	#1	#2	Radioactive Equipment and Floor Drain Sump Outside Containment Isolation
5-R-17-9-Z-42400	#1	#2	Centrifugal Charging Pumps
5-R-17-9-Z-42401	#1	#2	Boric Acid Transfer Pumps
6-R-17-9-Z-42402	#1	#2	Boron Thermal Regeneration Chiller
6-R-17-9-Z-42403	#1	#2	BTRS Chiller Pumps
9-R-17-9-Z-42404	#1	#2	Positive Displacement Charging Pump
5-R-17-9-Z-42405	#1	#2	Auxiliary Lube Oil Pumps for Charging Pumps
6-R-17-9-Z-42406	#1	#2	Reactor Coolant Purification Pump
5-R-17-9-Z-42408	#1	#2	Letdown Stop Valves
5-R-17-9-Z-42409	#1	#2	CVCS System MOVs
5-R-17-9-Z-42410	#1	#2	Letdown Isolation Valves
5-R-17-9-Z-42411	#1	#2	Letdown Orifice Isolation Valves
5-R-17-9-Z-42412	#1	#2	Seal Water Return Isolation Valves
5-R-17-9-Z-42413	#1	#2	Seal Water Injection Isolation Valves
5-R-17-9-Z-42414	#1	#2	RWST to Charging Pump Valve
5-R-17-9-Z-42415	#1	#2	VCT Outlet Isolation Valves
5-R-17-9-Z-42416	#1	#2	Charging Isolation Valve
6-R-17-9-Z-42417	#1	#2	Boron Thermal Regeneration Isolation Valve
6-R-17-9-Z-42418	#1	#2	RCP Seal Standpipe Fill Valves
6-R-17-9-Z-42419	#1	#2	Letdown Chiller HX Temperature Control Valve
6-R-17-9-Z-42420	#1	#2	Letdown Reheat HX Temperature Control Valves

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-R-17-9-Z-42421	#1	#2	Volume Control Tank Vent Valve
6-R-17-9-Z-42422	#1	#2	BTRS Bypass Valve
6-R-17-9-Z-42423	#1	#2	Boric Acid Filter to Makeup Flow Control Valve
6-R-17-9-Z-42424	#1	#2	Make-up Stop Valve to Charging Pump Suction
6-R-17-9-Z-42425	#1	#2	RMW Flow Control Valve
6-R-17-9-Z-42426	#1	#2	Makeup Stop Valve to VCT Inlet
6-R-17-9-Z-42427	#1	#2	Thermal Regeneration Manual Transfer Switch
6-R-17-9-Z-42428	#1	#2	Thermal Regeneration Switching (Off)
6-R-17-9-Z-42429	#1	#2	Thermal Regeneration Switching (Dilute and Borate)
6-R-17-9-Z-42430	#1	#2	Reactor Coolant Makeup Control
6-R-17-9-Z-42431	#1	#2	Reactor Coolant Makeup Control
6-R-17-9-Z-42432	#1	#2	Boron Thermal Regeneration Demineralizer Bypass
6-R-17-9-Z-42433	#1	#2	Steam Valve to Boric Acid Batching Tank
6-R-17-9-Z-42434	#1	#2	Letdown Valve to VCT or Holdup Tank
6-R-17-9-Z-42435	#1	#2	Letdown to Demineralizers Diversion Valve
6-R-17-9-Z-42436	#1	#2	RCP Seal No. 1 Shutoff Valves
6-R-17-9-Z-42437	#1	#2	Boron Concentration Measurement System Isolation Valves
6-R-17-9-Z-42438	#1	#2	Charging Pump Recirculation Valves
4-R-17-9-Z-42439	#1	#2	Excess Letdown Diversion Valve
5-R-17-9-Z-42440	#1	#2	Seal Water Injection Control Valve
6-R-17-9-Z-42441	#1	#2	CVCS MOVs

TABLE 1.7-2 (Continued)

NONPROPRIETARY INSTRUMENTATION & CONTROLS
LOGIC DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
6-R-17-9-Z-42442	#1	#2	Letdown Pressure Control Valve
5-R-17-9-Z-42443	#1	#2	Pressurizer Level and Charging Flow
6-R-17-9-Z-42444	#1	#2	BTRS Chiller Flow Control Valve
6-R-17-9-Z-42445	#1	#2	Letdown HX Outlet Control
6-R-17-9-Z-42446	#1	#2	Positive Displacement Pump Recirculation Valve
6-R-17-9-Z-42447	#1	#2	RCS Auxiliary Spray Valve
5-R-17-9-Z-42448	#1	#2	Charging Pump Isolation and Bypass Valves
5-R-17-9-Z-42449	#1	#2	Reactor Coolant Purity Control System Isolation Valves
6-R-32-9-Z-42500	#1	#2	Concentrates Storage Tank
6-R-32-9-Z-42501	#1	#2	Concentrates Storage Tank Mixer
6-R-32-9-Z-42502	#1	#2	Filter Transfer Cart Winch
5-C-26-1-Z-41540	N/A	N/A	Personnel Airlock
5-C-26-2-Z-41540	N/A	N/A	Personnel Airlock
5-R-20-1-Z-42068	N/A	N/A	RCFC Chilled Water Return Valves
5-R-20-2-Z-42068	N/A	N/A	RCFC Chilled Water Return Valves
5-R-17-1-Z-42450	N/A	N/A	CVCS Letdown Orifice Isolation Valves
5-R-17-2-Z-42450	N/A	N/A	CVCS Letdown Orifice Isolation Valves
5-R-17-2-Z-42451	#1	#2	Letdown Orifice Header Isolation Valve

TABLE 1.7-3

NONPROPRIETARY
SINGLE LINE DIAGRAMS

Drawing No.	Unit Designator U-1	Unit Designator U-2	Title
0-E-AAAA-01	N/A	N/A	Main One Line Unit No. 1 and 2
9-E-PFBD-01	#1	#2	480 V MCC 1A5, 1B5, and 1C5
0-E-PGAA-01	N/A	N/A	13.8 kV Emergency Service (SWGR 1K and 1L)(Unit 1 and Unit 2)
9-E-AAAB-01	#1	#2	Class 1E 125 V DC and 120 V Vital at Non-Class 1E 48 V, 125 V, 250 V DC and 120 V Vital AC Non-Class 1E Inverter Power for Computer 120 VAC Regulated Power 9-E-DJAA-01 125 V DC Class 1E Power Distribution Switchboard E1A11
9-E-DJAA-01	#1	#2	125 V DC Class 1E Power Distribution Switchboard E1A11
9-E-DJAB-01	#1	#2	125 V DC Class 1E Power Distribution Switchboard E1D11
9-E-DJAC-01	#1	#2	125 V DC Class 1E Power Distribution Switchboard E1B11
9-E-DJAD-01	#1	#2	125 V DC Class 1E Power Distribution Switchboard E1C11
9-E-DJAE-01	#1	#2	125 V DC Class 1E Distribution, Panels PL039A, PL039B, PL039C, PL040A (EAB)
9-E-DJAF-01	#1	#2	125 V DC Class 1E Distribution, Panels PL139A, PL139B, PL139C (DGB)
9-E-PFAA-01	#1	#2	480 V MCC 1J1(2J1)

TABLE 1.7-3 (Continued)

NONPROPRIETARY
SINGLE LINE DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-PFAB-01	#1	#2	480 V MCC 1J12(2J12)
9-E-PFAC-01	#1	#2	480 V MCC 1K1(2K1)
9-E-PFAD-01	#1	#2	480 V MCC 1K2(2K12)
9-E-PFAE-01	#1	#2	480 V MCC 1L1(2L1)
9-E-PFAF-01	#1	#2	480 V MCC 1L2(2L2)
9-E-PFAK-01	#1	#2	480 V MCC 1F4(2F4)
9-E-PKAA-01	#1	#2	4.16 kV Switchgear E1A
9-E-PKAB-01	#1	#2	4.16 kV Switchgear E1B
9-E-PKAC-01	#1	#2	4.16 kV Switchgear E1C
9-E-PMAK-01	#1	#2	480 V MCC E1A4(E2A4)
9-E-PMAL-01	#1	#2	480 V MCC E1B4(E2B4)
9-E-PMAM-01	#1	#2	480 V MCC E1C4(E2C4)
9-E-PLAA-01	#1	#2	480 V Load Center E1A
9-E-PLAB-01	#1	#2	480 V Load Center E1B
9-E-PLAC-01	#1	#2	480 V Load Center E1C
9-E-PMAA-01	#1	#2	480 V MCC E1A1
9-E-PMAA-02	#1	#2	480 V MCC E1A1
9-E-PMAB-01	#1	#2	480 V MCC E1A2
9-E-PMAC-01	#1	#2	480 V MCC E1A3 ECW Intake Structure
9-E-PMAD-01	#1	#2	480 V MCC E1B1
9-E-PMAD-02	#1	#2	480 V MCC E1B1

TABLE 1.7-3 (Continued)

NONPROPRIETARY
SINGLE LINE DIAGRAMS

Drawing No.	Unit Designator U-1	U-2	Title
9-E-PMAE-01	#1	#2	480 V MCC E1B2
9-E-PMAF-01	#1	#2	480 V MCC E1B3 ECW Intake Structure
9-E-PMAG-01	#1	#2	480 V MCC E1C1
9-E-PMAG-02	#1	#2	480 V MCC E1C1
9-E-PMAH-01	#1	#2	480 V MCC E1C2
9-E-PMAJ-01	#1	#2	480 V MCC E1C3, ECW Intake Structure
9-E-VAAA-01	#1	#2	Single Line Diagram Vital 120 V AC Distribution Panel DP001, DP1201, Channel I
9-E-VAAB-01	#1	#2	Single Line Diagram Vital 120 V AC Distribution Panel DP1202, DP1203, Channel II and III
9-E-VAAC-01	#1	#2	Single Line Diagram Vital 120 V AC Distribution Panel DP002, DP1204, Channel IV
9-E-VFAA-01	#1	#2	Single Line Diagram Class 1E 120/208 Volt Distribution Panel DPA 135, DPB 135, and DPC 135
9-E-VFAB-01	#1	#2	Single Line Diagram Class 1E 120/208 Volt Distribution Panel DPA 235, DPB 235, and DPC 235
9-E-VFAC-01	#1	#2	Single Line Diagram Class 1E 120/208 Volt Distribution Panel DPA 335, DPB 335, and DPC 335
9-E-VFAD-01	#1	#2	Single Line Diagram Class 1E 120/208 Volt Distribution Panel DPA 435, DPB 435, and DPC 435

UFSAR

Section 1.1

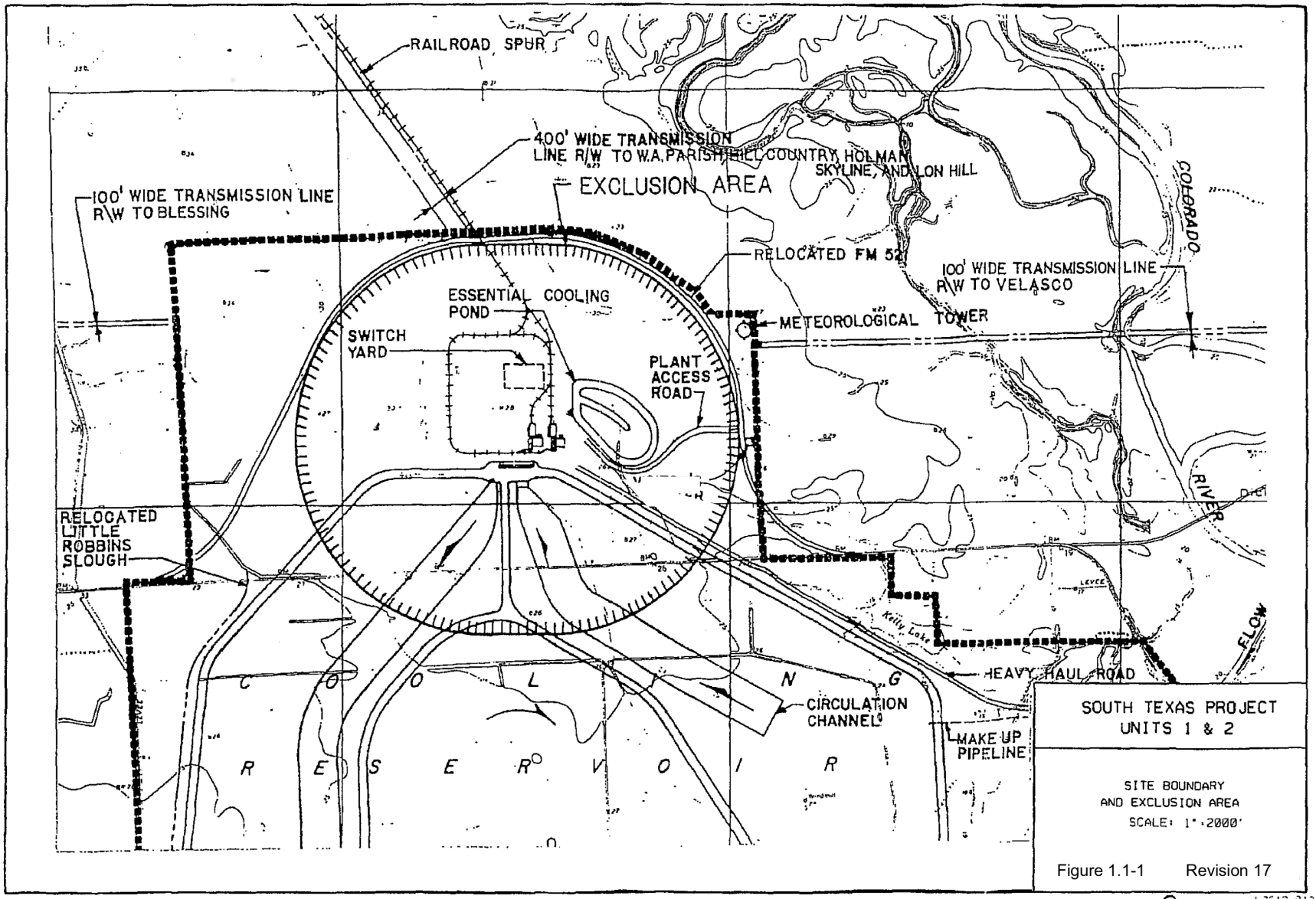


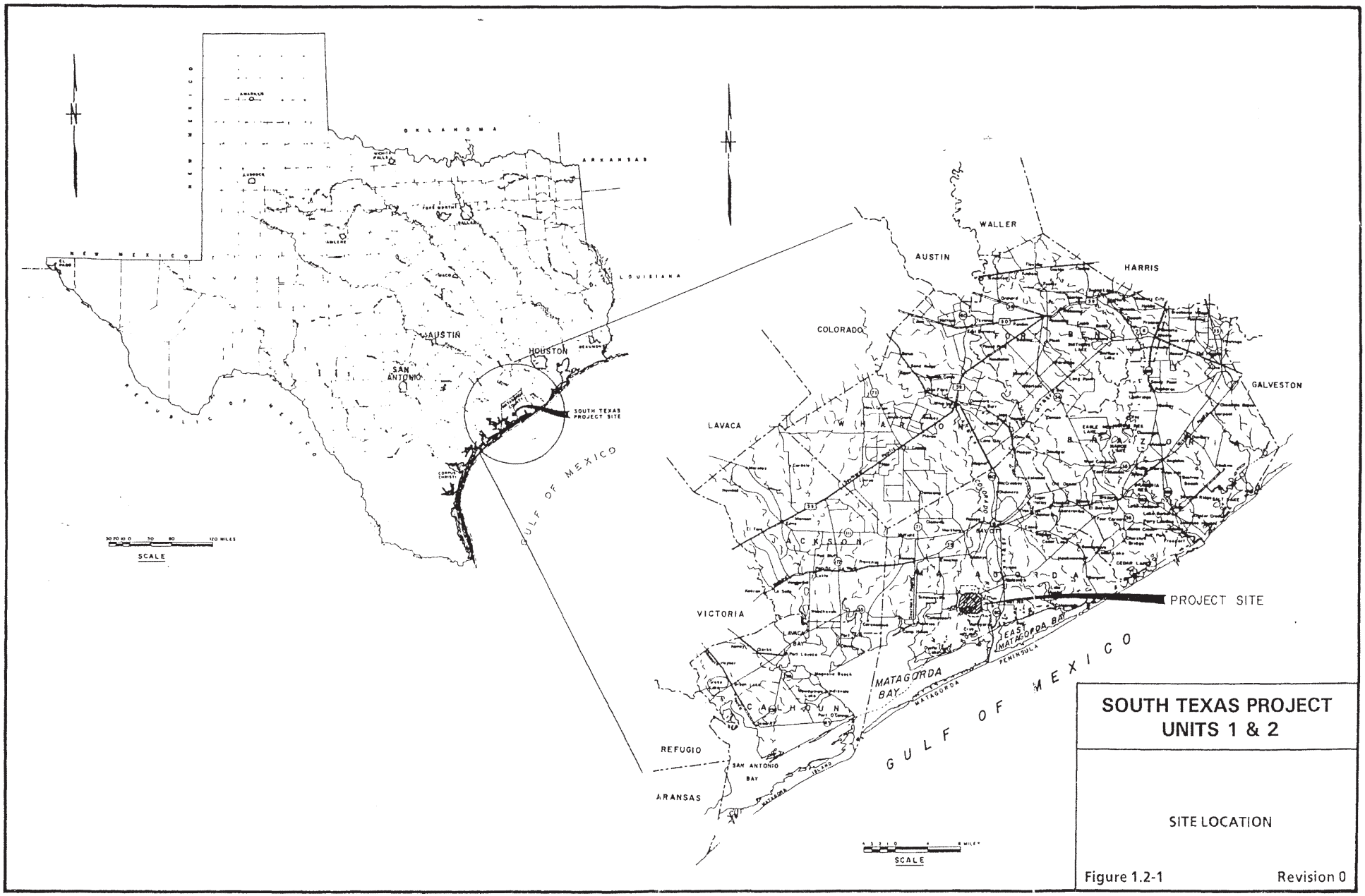
Figure 1.1-1 Revision 17

UFSAR FIGURE 1.1-2
Reference Drawing(s) 9A310F00001

UFSAR FIGURE 1.1-3
Reference Drawing(s) 9A310F00002

UFSAR

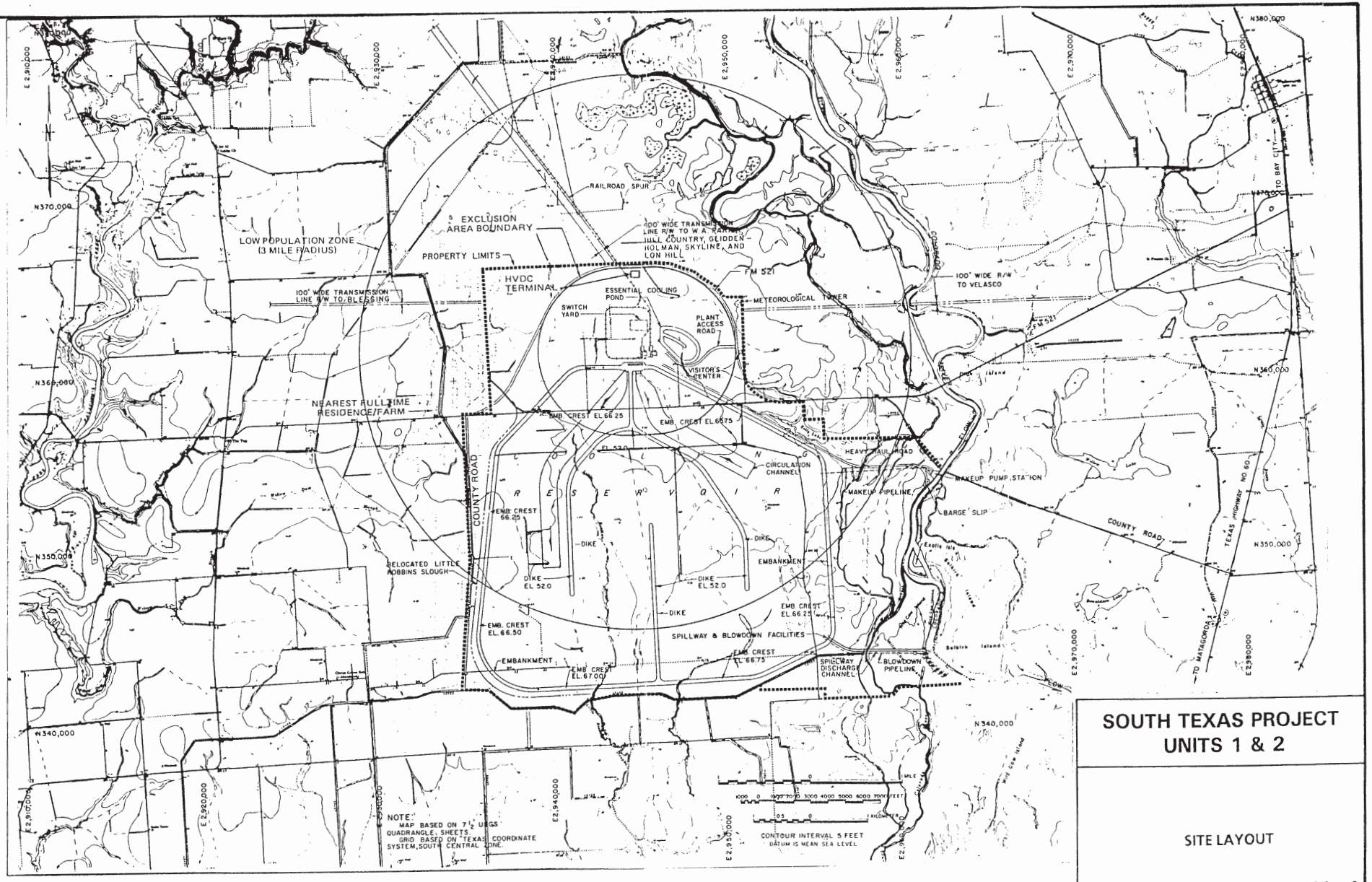
Section 1.2



SOUTH TEXAS PROJECT
UNITS 1 & 2

SITE LOCATION

Figure 1.2-1 Revision 0



SOUTH TEXAS PROJECT
UNITS 1 & 2

SITE LAYOUT

Figure 1.2-2

Revision 0

Withhold per 10CFR2.390

SOUTH TEXAS PROJECT
UNITS 1& 2

PLOT PLAN
9Y100M00001

UFSAR FIGURE 1.2-3 REVISION 17

ESEED.DGN

UFSARFIG1.2-3.DGN
U-SARFIG1.2-3.CIT

Withhold per 10CFR2.390

SOUTH TEXAS PROJECT
UNITS 1& 2

ENLARGED PLOT PLAN
DWG. NO. 9Y220M00002 REV. 4

FIGURE 1.2-4 REVISION 18

UFSARFIG1.2-4.DGN