1.1 INTRODUCTION

1.1.1 TYPE OF LICENSE

This FSAR is submitted by PPL Susquehanna, LLC in support of its application for an operating license for Susquehanna Steam Electric Station (Susquehanna SES) Units 1 and 2.

1.1.2 IDENTIFICATION OF APPLICANT

Application is made by PPL Susquehanna, LLC, Two North Ninth Street, Allentown, Pennsylvania, 18101.

1.1.3 NUMBER OF PLANT UNITS

The plant consists of two units which have a common control room, diesel generators and refueling floor, turbine operating deck, radwaste system, and other auxiliary systems.

1.1.4 DESCRIPTION OF LOCATION

The 2,355 acre plant site is located in Salem Township, Luzerne County, Pennsylvania, approximately 20 miles southwest of Wilkes-Barre, 50 miles northwest of Allentown and 70 miles northeast of Harrisburg.

1.1.5 TYPE OF NUCLEAR STEAM SUPPLY

The Nuclear Steam Supply System for each unit consists of a General Electric Boiling Water Reactor, BWR/4 product line with a 3952 MWt nominal rating.

1.1.6 TYPE OF CONTAINMENT

The containment is a pressure suppression type designated as Mark II. The drywell is a steel-lined concrete cone located above the steel-lined concrete cylindrical pressure suppression chamber.

The drywell and suppression chamber are separated by a concrete diaphragm slab which also serves to strengthen the entire system.

1.1.7 CORE THERMAL POWER LEVELS

The rated core thermal power for each unit is 3952 MWt. The nominal turbine generator output at 3952 MWt is 1300 MWe for both Unit 1 and Unit 2.

1.1.8 SCHEDULED FUEL LOAD AND OPERATION DATA

Unit 1 original fuel load was on July 27, 1982 with a commercial operation date of June 8, 1983. Unit 2 original fuel load was March 28, 1984 with a commercial operation date of February 12, 1985.

1.1.9 FSAR ORGANIZATION

The Susquehanna SES Final Safety Analysis Report (FSAR) has been organized using Regulatory Guide 1.70 Revision 2 (September, 1975).

Where information has been presented that has not been specifically requested by the standard format, the information is presented in the appropriate chapter as a section or subsection, and follows the information specifically requested by the standard format.

Tabulations of data are designated "tables" and are identified by the section number, followed by a dash and number of table according to its order in the text; e.g., Table 3.4-5 is the fifth table of Section 3.4. Drawings, pictures, sketches, curves, graphs, and engineering diagrams are identified as "figures" and are numbered in the same manner as tables.

1.2 GENERAL PLANT DESCRIPTION

1.2.1 PRINCIPAL DESIGN CRITERIA

The principal criteria for design, construction, and testing of the Susquehanna SES are summarized below. Specific criteria, codes and standards are addressed in Section 3.0.

1.2.1.1 General Design Criteria

The Susquehanna SES design conforms to the requirements given in 10CFR50, Appendix A. Specific compliance is discussed in Section 3.1.

1. The plant is designed, fabricated, and erected to produce electrical power in accordance with the codes, standards, and regulations as described in Section 3.1.

2. Safety related systems are designed to permit safe plant operation and to accommodate postulated accidents without endangering the health and safety of the public.

1.2.1.2 System Design Criteria

1.2.1.2.1 Nuclear System Criteria

1. The fuel cladding is designed to retain integrity as a radioactive material barrier for the design power range. The fuel cladding is designed to accommodate, without loss of integrity, the pressures generated by the fission gases released from the fuel material throughout the design life of the fuel.

2. The fuel cladding, in conjunction with other plant systems, is designed to retain integrity throughout any abnormal operational transient.

3. Those portions of the nuclear system which form part of the reactor coolant pressure boundary are designed to retain integrity as a radioactive material barrier during normal operation following abnormal operational transients and accidents.

4. Heat removal systems are provided in sufficient capacity and operational adequacy to remove heat generated in the reactor core for the full range of normal operational conditions from shutdown to design power, and for any abnormal operational transient.

5. Heat removal systems are provided to remove decay heat generated in the core under circumstances wherein the normal operational heat removal systems become inoperative. The capacity of such systems is adequate to prevent fuel clad damage. The reactor is capable of being shut down automatically in sufficient time to permit decay heat removal systems to become effective following loss of operation of normal heat removal systems.

6. The reactor core and reactivity control systems are designed so that control rod action is capable of bringing the core subcritical and maintaining it so, even with the rod of highest reactivity worth fully withdrawn and unavailable for insertion.

7. The nuclear system is designed so there is no tendency for divergent oscillation of any operating characteristics, considering the interaction of the nuclear system with other appropriate plant systems.

8. The reactor core is designed so that its nuclear characteristics do not contribute to a divergent power transient.

1.2.1.2.2 Safety Related Systems Criteria

1.2.1.2.2.1 General

1. Safety systems act in response to abnormal operational transients so that fuel cladding retains its integrity as a radioactive material barrier.

2. Safety systems and engineered safety features act to ensure that no damage to the nuclear system process barrier results from internal pressures caused by abnormal operational transients or accidents.

3. Where positive, precise actions are required in immediate response to accidents, such actions are automatic and require no decision or manipulation of controls by operations personnel.

4. Essential safety actions are carried out by equipment of sufficient redundance and independence that no single failure of active components can prevent the required actions. For systems or components to which IEEE 279-1971 is applicable, single failures of passive electrical components are considered as well as single failures of active components in recognition of the higher anticipated failure rates of passive electrical components relative to passive mechanical components.

5. Features of the station that are essential to the mitigation of accident consequences are designed, fabricated, and erected to quality standards which reflect the importance of the safety function to be performed.

6. The design of safety systems and engineered safety features includes allowances for environmental phenomena at the site.

7. Provision is made for control of active components of safety systems and engineered safety features from the control room.

8. Safety systems and engineered safety features are designed to permit demonstration of their functional performance requirements.

1.2.1.2.2.2 Containment and Isolation Criteria

1. A primary containment is provided to completely enclose the reactor vessel. It is designed to act as a radioactive material barrier during accidents that release radioactive material into the primary containment. It is possible to test the primary containment integrity and leak tightness at periodic intervals.

2. A secondary containment that completely encloses both primary containment and fuel storage areas is provided and is designed to act as a radioactive material barrier.

3. The primary and secondary containments, in conjunction with other engineered safety features, act to prevent radioactive material released from the containment volumes from exceeding the guideline values of applicable regulations.

4. Provisions are made for the removal of energy from within the primary containment as necessary to maintain the integrity of the containment system following accidents that release energy to the primary containment.

5. Piping that penetrates the primary containment structure and could serve as a path for the uncontrolled release of radioactive material to the environs is automatically isolated whenever there is a threat of uncontrolled radioactive material being released. Such isolation is effected in time to prevent radiological effects from exceeding the values of applicable regulations.

1.2.1.2.2.3 Emergency Core Cooling System (ECCS) Criteria

1. ECCS systems are provided to limit fuel cladding temperature to temperatures below the onset of fragmentation (2200°F) in the event of a loss of coolant accident.

2. The ECCS provides for continuity of core cooling over the complete range of postulated break sizes in the nuclear system process barrier.

3. The ECCS is diverse, reliable, and redundant.

4. Operation of the ECCS is initiated automatically when required regardless of the availability of off-site power supplies and the normal generating system of the plant.

1.2.1.2.3 Process Control Systems Criteria

1.2.1.2.3.1 Nuclear System Process Control Criteria

1. Control equipment is provided to allow the reactor to respond to limited load changes, major load changes and abnormal operational transients.

2. It is possible to control the reactor power level manually.

3. Control of the nuclear system is possible from a single location.

4. Nuclear system process controls are arranged to allow the operator to rapidly assess the condition of the nuclear system and to locate process system malfunctions.

5. Interlocks, or other automatic equipment, are provided as a backup to procedural controls to avoid conditions requiring the actuation of nuclear safety systems or engineered safety features.

6. If the control room is inaccessible, it is possible to bring the reactor from power range operation to a hot shutdown condition by manipulation of controls and equipment which are available outside of the control room. Furthermore, station design does not preclude the ability, in this event, to bring the reactor to a cold shutdown condition from the hot shutdown condition.

1.2.1.2.3.2 Power Conversion Systems Process Control Criteria

1. Controls are provided to maintain temperature and pressure to below design limitations. This system will result in a stable operation and response for all allowable variations.

2. Controls are designed to provide indication of system trouble.

3. Control of the power conversion system is possible from a single location.

4. Controls are provided to ensure adequate cooling of power conversion system equipment.

5. Controls are provided to ensure adequate condensate purity.

6. Controls are provided to regulate the supply of water so that adequate reactor vessel water level is maintained.

1.2.1.2.3.3 Electrical Power System Process Control Criteria

1. Controls are provided to ensure that sufficient electrical power is provided for startup, normal operation, prompt shutdown and continued maintenance of the station in a safe condition.

2. Control of the electrical power system is possible from a single location.

1.2.1.2.4 Electrical Power System Criteria

1. The station electrical power systems are designed to deliver the electrical power generated.

2. Sufficient normal auxiliary sources of electrical power are provided to attain prompt shutdown and continued maintenance of the station in a safe condition. The capacity of the power sources is adequate to accomplish all required engineered safety features under postulated design basis accident conditions.

3. Standby electrical power sources are provided to allow prompt reactor shutdown and removal of decay heat under circumstances where preferred power is not available. They provide sufficient power to all engineered safety features requiring electrical power.

1.2.1.2.5 Fuel Handling and Storage Facilities

1. Fuel handling and storage facilities are located in the reactor building and are designed to preclude criticality and to maintain adequate shielding and cooling for spent fuel.

   Additional spent fuel storage facilities are provided at the Independent Spent Fuel Storage Installation (ISFSI) located north of the Low Level Radwaste Holding Facility (LLRWHF). The ISFSI is described in detail in Section 11.7. Handling of spent fuel stored at the ISFSI is in the Reactor Building and is designed to preclude criticality and to maintain adequate shielding and cooling for spent fuel.

1.2.1.2.6 Auxiliary Systems Criteria

1. Multiple independent station auxiliary systems are provided for the purpose of cooling and servicing the station, the reactor and the station containment systems under various normal and abnormal conditions.

2. Backup reactor shutdown capability is provided independent of normal reactivity control provisions. This backup system has the capability to shut down the reactor from any operating condition, and subsequently to maintain the shutdown condition.

1.2.1.2.7 Power Conversion Systems Criteria

Components of the power conversion systems are designed to fulfill the following basic objectives:

a) Generate electricity with the turbine generator from steam produced in the reactor, condense the exhaust steam in the condenser and return the condensed water to the reactor as heated feedwater with most of the non-condensable gases and impurities removed.

b) Ensure that any fission products or radioactivity associated with the steam and condensate during normal operation are safely contained inside the system or are released under controlled conditions in accordance with waste disposal procedures.

1.2.1.2.8 Radioactive Waste Disposal Criteria

1. Gaseous, liquid, and solid waste disposal facilities are designed so that the discharge of radioactive effluents, storage, and off-site shipment of radioactive material are made in accordance with applicable regulations.

2. These facilities include means for informing station operating personnel whenever operational limits on the release of radioactive material are exceeded.

3. A separate facility for interim on-site storage of low level radioactive waste material as of April 30, 1988 was included under the 10CFR Part 50 facility operating licenses.

1.2.1.2.9 Shielding and Access Control Criteria

1. Radiation shielding is provided and access control patterns are established to allow the operating staff to control radiation doses within the limits of applicable regulations in any mode of normal station operation. The design and establishment of the above include conditions that deal with fission product release from failed fuel elements and contamination of station areas from system leakage.

2. The control room is shielded against radiation and has suitable environmental control so that occupancy under design basis accident conditions is possible.

1.2.2 PLANT DESCRIPTION

1.2.2.1 Site Characteristics

1.2.2.1.1 Location and Size

In terms of its relationship to metropolitan areas, the plant site lies approximately 20 miles southwest of Wilkes-Barre, approximately 50 miles northwest of Allentown, and approximately 70 miles northeast of Harrisburg. The plant is a two unit, Boiling Water Reactor. Each unit has a nominal rating of 1300 MWe. It is located on a 1,574 acre property owned by PPL in Salem Township, Luzerne County, Pennsylvania, along the west bank of the Susquehanna River approximately 5 miles northeast of the borough of Berwick, Pennsylvania. In addition, 717 acres of the site are located on the east side of the river in Conyngham and Hollenback Township. Total site acreage is approximately 2,355 acres. There are no structures or facilities on the east side of the river with the exception of transmission lines and facilities. A map of the site area including major structures and facilities is provided as Figure 2.1-12. PPL owns the entire 1800 foot plant exclusion area (except for Township Route T-419) and has complete authority to regulate any and all access and activity within that area.

The property in Salem Township is open deciduous woodland, interspersed with grassland and orchards and is bounded on its eastern flank by the Susquehanna River, which has a low water elevation of 484 feet MSL in this vicinity. Much of the northern property boundary runs along the slopes of an east-west trending ridge rising to a maximum elevation of 1060 feet MSL. This ridge abuts a rolling plateau to the south which in turn falls gradually in an easterly direction toward the floodplain of the Susquehanna River. The plant site is located on this plateau at an approximate grade of 675 feet MSL. Rainfall runoff leads into two main valleys that form intermittent waterways draining to the Susquehanna River, east of the property.

Also, in Salem Township a portion of the long abandoned North Branch Canal runs north-south across the floodplain between the Susquehanna River and U.S. Route 11. Within the property limits, the northern portion of the canal is generally dry and overgrown with trees and shrubs whereas the southern portion contains stagnant water. A permanent 30 acre body of water named Lake "Took-a-While" is located just west of the canal. An approximate 400 acre recreation area has been developed on the floodplain.

Acreage in Conyngham and Hollenback Townships of Luzerne County on the east side of the Susquehanna River is open to the public for hunting, fishing and hiking. One of the trails leads to the scenic view from Council Cup, a 700-foot high bluff overlooking the Susquehanna River valley.

A multiple-use land management program coordinated through a 10-year forest stewartship plan is aimed at providing a mix of woodlands, farming, recreation, a wildlife habitat, timber production, and historical protection.

1.2.2.1.2 Road and Rail Access

US Route 11 runs north-south through the property along the western edge of the floodplain. In this vicinity, the highway has a pavement width of 36 feet and is of bitumen-topped concrete slab construction. Township road T419, which follows the toe of the east-west trending ridge described above, leads off US 11 to traverse the property and link with Township road T438 which passes through the western portion of the property. Both of these Township roads are paved in this vicinity. A railroad line on the floodplain parallels US 11 in traversing the property. The North Shore Railroad Co. operates this line owned by The Commonwealth of Pennsylvania. The railroad is a single track, non-electrified line of standard gage. The nearest railroad station is at Berwick, 5 miles to the south. Access to the various facilities is provided as follows:

a) a MAIN and a SECONDARY ACCESS ROAD leading from US 11 at separate locations to serve the main power block and surrounding structures

b) an ACCESS RAILROAD SPUR leading from the Conrail (Erie-Lackawanna) Railroad to serve the main power block and cooling tower areas

c) PLANT ROADS providing access to all structures as well as connecting with the Main and Secondary access roads

d) a RIVER FACILITIES ACCESS ROAD leading from US 11 to the intake structure on the river bank

e) a PERIMETER PATROL ROAD paralleling and within the plant security fence

1.2.2.1.3 Description of Plant Environs

1.2.2.1.3.1 Geology and Soils

The property is underlain by a series of tightly folded strata of Paleozoic age, trending generally northeast-southwest. Pleistocene glacial outwash deposits mantle much of the area, particularly in topographic depressions. Underlying these glacial deposits are strata of Devonian and older ages. The plant site area is underlain by a series of siltstone, sandstone and shale beds of the Hamilton and Susquehanna groups of Devonian age.

Soils in the area are derived from parent material of glacial origin. These soils are acidic, well drained and generally not well suited for agricultural purposes.

1.2.2.1.3.2 Groundwater

The two principal aquifer systems in the region are the unconsolidated glacial and alluvial deposits and the underlying bedrock formations. The glacial deposits consist of drift, till, and outwash materials and vary in permeability from very low to high. The thickness of these deposits is highly variable in the site vicinity, ranging from 1 or 2 feet to over 100 feet. Wells penetrating the bedrock produce water from Onondaga limestone and strata of the Hamilton siltstone group.

The groundwater table in the area is a subdued replica of the surface topography. At the site, the water table is found generally within 35 feet of the ground surface, usually just below the bedrock surface but sometimes within the overburden soils.

Groundwater is the primary source of water supply in the region. The plant potable water supply is obtained from groundwater. There will be no impact to surrounding wells (groundwater level) due to Plant usage, as documented in Dames & Moore report titled "Environmental Feasibility for Groundwater Supply at SSES" dated 9/24/86.

1.2.2.1.3.3 Hydrology

The Susquehanna River Basin comprises an area of about 27,500 square miles in the states of New York, Pennsylvania and Maryland. The plant site is located on the west side of the Main Branch of the Susquehanna River, approximately 42 miles upstream from the confluence of the Main and West Branches at Sunbury, Pennsylvania. The Main Branch has its source at Otsego Lake about 35 miles southeast of Utica, New York. From Otsego Lake, the river flows generally southwest. The Lackawanna River joins it near Pittston, Pennsylvania. From there it flows past the site.

The extreme and average daily flows recorded at the gaging station at Wilkes-Barre, about 20 miles upstream from the site, are:

	Flow *(cfs)*	*(gpm)*	*Date*
Minimum	528	$2.38x10^5$	September 27,1964
Average	13,000	$5.85x10^6$	70 years of record
Maximum	345,000	$1.55x10^8$	June 24, 1972 (Hurricane Agnes)

The River's path is controlled by the geologic structure in the site area, following the regional folding and jointing pattern. Just north of the site area, the river cuts across the regional fold axis along a major joint set before swinging west-southwest and paralleling the regional fold axis.

The river gradient is approximately 1.5 feet per mile near the site. The river has long pools, short riffles and shallow bedrock flats. Scouring during spring floods has removed most silt deposits except in quiet pools. The river formerly had large deposits of coal silt, most of which have been removed by dredging. Below Shickshinny, a large pool extends downstream to a point near Mocanaqua; below this point the water is shallower and faster. The bed is rock and gravel, and the river is interspersed with islands. Both upstream and downstream portions of these islands have clean gravel bars.

1.2.2.1.3.4 Meteorology

A modified continental-type climate prevails in the general area of the site. Normally, the frost-free season extends from late April to mid October. Minimum temperatures during December, January, and February usually are below freezing, but rarely dip below 0°F. Maximum temperatures above 100°F have seldom been recorded. The yearly relative humidity averages about 70 percent. Mean annual snowfall in the region is about 52 inches. In winter the area has about 40 percent of sunshine; the summer percentage is about 60 percent. Heavy thunderstorms have occasionally caused damage over limited areas and tornado-force winds have been reported.

The annual precipitation is about 38 inches. July is normally the wettest month, with an average rainfall of about 5 inches, and February is the driest, with about 2 inches.

The dominant wind is from the West-Southwest Sector.

1.2.2.1.3.5 Seismicity

Of the very few earthquakes which have occurred in Pennsylvania during historical times, most have been in the southeastern part of the State.

Only minor damage has ever been recorded from earth movement in Pennsylvania, with the exception of the two disturbances at Wilkes-Barre in 1954. It is doubtful whether the latter were the direct result of an earthquake. Since the affected area was only 2000 square feet and no record was made of the disturbances at any of the nearest seismic stations, it is likely they were associated with mining activities and the readjustment of alluvial deposits.

Because of the small correlation between seismic activity and known faults or tectonics, the area can be said to constitute an inactive seismotectonic province.

1.2.2.2 General Arrangement of Structures and Equipment

The principal structures and facilities located at the Plant Site are shown on Figure 2.1-11.

The equipment arrangements for these structures are shown in Dwgs. M-220, Sh. 1, M-221, Sh. 1, M-222, Sh. 1, M-223, Sh. 1, M-224, Sh. 1, M-225, Sh. 1, M-226, Sh. 1, M-227, Sh. 1, M-230, Sh. 1, M-231, Sh. 1, M-232, Sh. 1, M-233, Sh. 1, M-234, Sh. 1, M-235, Sh. 1, M-236, Sh. 1, M-237, Sh. 1, M-240, Sh. 1, M-241, Sh. 1, M-242, Sh. 1, M-243, Sh. 1, M-244, Sh. 1, M-245, Sh. 1, M-246, Sh. 1, M-247, Sh. 1, M-248, Sh. 1, M-249, Sh. 1, M-250, Sh. 1, M-251, Sh. 1, M-252, Sh. 1, M-253, Sh. 1, M-254, Sh. 1, M-255, Sh. 1, M-256, Sh. 1, M-257, Sh. 1, M-258, Sh. 1, M-259, Sh. 1, M-260, Sh. 1, M-261, Sh. 1, M-270, Sh. 1, M-271, Sh. 1, M-272, Sh. 1, M-273, Sh. 1, M-274, Sh. 1, M-276, Sh. 1, M-280, Sh. 1, M-281, Sh. 1, M-282, Sh. 1, M-284, Sh. 1, M-5200, Sh. 1, and M-5200, Sh. 2.

1.2.2.3 Nuclear System

The nuclear system includes a single cycle, forced circulation, General Electric Boiling Water Reactor producing steam for direct use in the steam turbine. Heat balances showing the major parameters of the nuclear system for the rated power condition, at rated core flow and at 108 Mlb/hr increased core flow, are shown in Figures 1.2-49 and 1.2-49-1 for Unit 1 and Figures 1.2-49-2 and 1.2-49-3 for Unit 2. The reactor heat balances differ slightly from the turbine heat balances (Figures 10.1-1a and 10.1-1b). The reactor heat balances are based on the measured moisture fraction exiting the reactor, and the moisture fraction exiting the MISV's is determined by the expected pressure drop between the reactor vessel steam dome and the MSIV exit. The turbine heat balance is based on turbine inlet design conditions, which allow for a slightly greater moisture fraction in the steam.

1.2.2.3.1 Reactor Core and Control Rods

The fuel for the reactor core consists of depleted, natural, and/or slightly enriched uranium dioxide pellets contained in sealed Zircaloy-2 tubes. These fuel rods are assembled into individual fuel assemblies. The number of fuel assemblies in the complete core is 764. Gross control of the core is achieved by movable, bottom entry control rods. The control rods are of cruciform shape and are distributed evenly throughout the core. The control rods are positioned by individual control rod drives.

Each fuel assembly has several fuel rods with gadolinia (Gd_2O_3) mixed in solid solution with the UO_2. The gadolinia is burnable poison which diminishes the reactivity of the fresh fuel. It is depleted as the fuel reaches the end of its first cycle.

A conservative limit of plastic strain is the design criterion used for fuel rod cladding failure. The peak linear heat generation for steady-state operation is well below the fuel damage limit even late in life. Experience has shown that the control rods are not susceptible to distortion and have an average life expectancy many times the residence time of a fuel loading.

1.2.2.3.2 Reactor Vessel and Internals

The reactor vessel contains the core and supporting structure; the steam separators and dryers; the jet pumps; the control rod guide tubes; distribution lines for the feedwater, core spray, and standby liquid control; the incore instrumentation; and other components. The main connections to the vessel include the steam lines, the coolant recirculation lines, the feedwater lines, the control rod drive housings, and the ECCS lines.

The reactor vessel is designed and fabricated in accordance with applicable codes for a pressure of 1250 psig. The nominal operating pressure is 1050 psia in the steam space above the separators. The vessel is fabricated of carbon steel and is clad internally with stainless steel (except for the top head which is not clad).

The core is cooled by reactor water that enters the lower portion of the core and boils as it flows upward around the fuel rods. The chemistry of reactor water is controlled to minimize corrosion of the fuel cladding, reactor vessel internals and reactor coolant system pressure boundary and to control the transport and deposition of corrosion product activity. The steam leaving the core is dried by steam separators and dryers, located in the upper portion of the reactor vessel. The steam is then directed to the turbine through four main steam line(s). Each steam line is provided with two isolation valves in series, one on each side of the primary containment barrier.

1.2.2.3.3 Reactor Recirculation System

The Reactor Recirculation System pumps reactor coolant through the core to remove the energy generated in the fuel. This is accomplished by two recirculation loops external to the reactor vessel but inside the primary containment. Each loop has one motor-driven recirculation pump. Recirculation pump speed can be varied to allow some control of reactor power level through the effects of coolant flow rate on moderator void content.

1.2.2.3.4 Residual Heat Removal System

The Residual Heat Removal System (RHRS) consists of pumps, heat exchangers and piping that fulfill the following functions:

a. Removal of decay heat during and after plant shutdown.

b. Rapid injection of water into the reactor vessel following a loss of coolant accident, at a rate sufficient to reflood the core maintain fuel cladding below the limits contained in 10 CFR 50.46. This is discussed in Subsection 1.2.2.4.

c. Removal of heat from the primary containment following a loss-of-coolant accident (LOCA) to limit the increase in primary containment pressure. This is accomplished by cooling and recirculating the water inside the primary containment. The redundancy of the equipment provided for the containment is further extended by a separate part of the RHRS which sprays cooling water into the drywell. This latter capability is discussed in Subsection 1.2.2.4.12.

d. Provide for cooling of the spent fuel pool(s) following a seismic event which results in a loss of normal spent fuel pool cooling, in conjunction with normal shutdown of both units.

1.2.2.3.5 Reactor Water Cleanup System (RWCU)

A Reactor Water Cleanup System, which includes filter demineralizers, is provided to clean up the reactor cooling water, to reduce the amounts of activated corrosion products in the water, and to remove reactor coolant from the nuclear system under controlled conditions.

1.2.2.4 Safety Related Systems

Safety related systems provide actions necessary to assure safe shutdown, to protect the integrity of radioactive material barriers, and/or to prevent the release of radioactive material in excess allowable dose limits. These systems may be components, groups of components, systems, or groups of systems. Engineered Safety Feature (ESF) systems are included in this category. ESF systems have a sole function of mitigating the consequences of design basis accidents.

1.2.2.4.1 Reactor Protection System

The Reactor Protection System initiates a rapid, automatic shutdown (scram) of the reactor. This action is taken in time to prevent excessive fuel cladding temperatures and any nuclear system process barrier damage following abnormal operational transients. The Reactor Protection System overrides all operator actions and process controls.

1.2.2.4.2 Neutron-Monitoring System

Not all of the Neutron Monitoring System qualifies as a nuclear safety system; only those portions that provide high neutron flux signals and neutron flux oscillation signals to the Reactor Protection System are safety related. The intermediate range monitors (IRM), oscillation power range monitors (OPRM), and average power range monitors (APRM), which monitor neutron flux via in-core detectors, signal the Reactor Protection System in time to prevent excessive fuel clad temperatures as a result of abnormal operational transients.

1.2.2.4.3 Control Rod Drive System

When a scram is initiated by the Reactor Protection System, the Control Rod Drive System inserts the negative reactivity necessary to shut down the reactor. Each control rod is controlled individually by a hydraulic control unit. When a scram signal is received, high pressure water from an accumulator for each rod forces each control rod rapidly into the core.

1.2.2.4.4 Nuclear System Pressure Relief System

A Pressure Relief System, consisting of safety-relief valves mounted on the main steam lines, prevents excessive pressure inside the nuclear system following either abnormal operational transients or accidents.

1.2.2.4.5 Reactor Core Isolation Cooling System

The Reactor Core Isolation Cooling System (RCIC) provides makeup water to the reactor vessel whenever the vessel is isolated from the main condenser and feed water system. The RCICS uses a steam driven turbine-pump unit and operates automatically, in time and with sufficient coolant flow, to maintain adequate reactor vessel water level.

1.2.2.4.6 Primary Containment

A pressure-suppression primary containment houses the reactor vessel, the reactor coolant recirculating loops, and other branch connections of the reactor primary system. The pressure suppression system consists of a drywell, a pressure-suppression chamber storing a large volume of water, a connecting vent system between the drywell and the water pool, isolation valves, containment cooling systems, and other service equipment. In the event of a process system piping failure within the drywell, reactor water and steam would be released into the drywell air space. The resulting increased drywell pressure would then force a mixture of air, steam, and water through the vents into the pool of water stored in the suppression chamber. The steam would condense rapidly in the suppression pool, resulting in a rapid pressure reduction in the drywell. Air transferred to the suppression chamber pressurizes the suppression chamber and is subsequently vented to the drywell to equalize the pressure between the two chambers. Cooling systems remove heat from the reactor core, the drywell, and from the water in the suppression chamber, thus providing continuous cooling of the primary containment under accident conditions. Appropriate isolation valves are actuated during this period to ensure containment of radioactive materials within the primary containment. Hydrogen recombiners are provided in the drywell and wetwell to control combustible gases after a LOCA (not credited in the accident analysis).

1.2.2.4.7 Primary Containment and Reactor Vessel Isolation Control System

The Primary Containment and Reactor Vessel Isolation Control System automatically initiates closure of isolation valves to close off all process lines which are potential leakage paths for radioactive material to the environs. This action is taken upon indication of a potential breach in the nuclear system process barrier.

1.2.2.4.8 Secondary Containment

Any leakage from the primary containment system is to the secondary containment system. This system includes the Standby Gas Treatment System and the Reactor Building Recirculation System. The secondary containment system is designed to minimize the release at ground level of airborne radioactive materials, and to provide for the controlled, filtered release of the reactor building atmosphere at roof level under accident conditions.

1.2.2.4.9 Main Steam Line Isolation Valves

Although process lines which penetrate the primary containment and offer a potential release path for radioactive material are provided with redundant isolation capabilities, the main steam lines, because of their large size and large mass flow rates, are given special isolation consideration. Two automatic isolation valves, each powered by both air pressure and spring force, are provided in each main steam line. These valves fulfill the following objectives:

a. To prevent excessive damage to the fuel barrier by limiting the loss of reactor coolant from the reactor vessel resulting either from a major leak from the steam piping outside the primary containment or from a malfunction of the pressure control system resulting in excessive steam flow from the reactor vessel.

b. To limit the release of radioactive materials, by closing the nuclear system process barrier, in case of a gross release of radioactive materials from the fuel to the reactor coolant and steam.

c. To limit the release of radioactive materials, by closing the primary containment barrier, in case of a major leak from the nuclear system inside the primary containment.

In addition the main steamline isolation valve leakage Isolated Condenser Treatment Method (Section 6.7) is provided to process the fission products after a LOCA. By directing the leakage from the closed main steamline isolation valves through the main steam drain line to the condenser, this leakage is processed prior to release to the atmosphere.

1.2.2.4.10 Main Steam Line Flow Restrictors

A venturi-type flow restrictor is installed in each steam line close to the reactor vessel. These devices limit the loss of coolant from the reactor vessel and prevent uncovering of the core before the main steam line isolation valves are closed in case of a main steam line break.

1.2.2.4.11 Emergency Core Cooling Systems (ECCS)

Four Core Standby Cooling Systems are provided to prevent excessive fuel clad temperatures if a breach in the nuclear system process barrier results in a loss of reactor coolant. The four Core Standby Cooling Systems are:

1. High Pressure Coolant Injection System (HPCIS)

   The HPCIS provides and maintains an adequate coolant inventory inside the reactor vessel to prevent excessive fuel clad temperatures as a result of postulated small breaks in the Reactor Coolant Pressure Boundary (RCPB). A high pressure system is needed for such breaks because the reactor vessel depressurizes slowly, preventing low pressure systems from injecting coolant. The HPCIS includes a turbine driven pump powered by reactor steam. The system is designed to accomplish its function on a short-term basis without reliance on plant auxiliary power supplies other than the dc power supply.

2. Automatic Depressurization System (ADS)

The ADS acts to rapidly reduce reactor vessel pressure in a LOCA situation in which the HPCIS fails to automatically maintain reactor vessel water level. The depressurization provided enables the low pressure standby cooling systems to deliver cooling water to the reactor vessel. The ADS uses some of the safety-relief valves which are part of the Nuclear System Pressure Relief System. The automatic safety-relief valves are arranged to open when a break in the nuclear system process barrier has occurred and the HPCIS is not delivering sufficient cooling water to the reactor vessel to maintain the water level above a preselected value. The ADS will not be activated unless either the Core Spray or the Low Pressure Coolant Injection System Pumps are operating.

3. Core Spray System

The Core Spray System consists of two independent pump loops that deliver cooling water to spray spargers over the core. The system is actuated by conditions indicating that breach exists in the nuclear system process barrier, but water is delivered to the core only after reactor vessel pressure is reduced. This system provides the capability to cool the fuel by spraying water onto the core. Either core spray loop, together with another ECCS system, is capable of preventing excessive fuel clad temperatures following a LOCA.

4. Low Pressure Coolant Injection (LPCI)

Low Pressure Coolant Injection (LPCI) is an operating mode of the Residual Heat Removal System (RHRS) and is an engineered safety feature. LPCI uses the pump loops of the RHRS to inject cooling water at low pressure into a reactor recirculation loop. LPCI is actuated by conditions indicating a breach in the nuclear system process barrier, but water is delivered to the core only after reactor vessel pressure is reduced. LPCI operation, together with the core shroud and jet pump arrangement, provides the capability of core reflooding following a LOCA in time to prevent excessive fuel clad temperatures.

1.2.2.4.12 Residual Heat Removal System (Containment Cooling)

The Residual Heat Removal System (RHRS) for containment cooling is placed in operation to limit the temperature of the water in the suppression pool following a design basis LOCA. In the containment cooling mode of operation, the RHRS pumps take suction from the suppression pool and deliver the water through the RHRS heat exchangers, where cooling takes place by transferring heat to the RHR service water. The fluid is then discharged back to the suppression pool.

As an alternative, RHRSW can be aligned to an RHR heat exchanger when RHR is aligned in the LPCI operating mode to support long term containment cooling.

Another portion of the RHRS is provided to spray water into the primary containment as a means of reducing containment pressure following a LOCA. This capability is in excess of the required energy removal capability and can be placed into service at the discretion of the operator.

1.2.2.4.13 Control Rod Velocity Limiter

A control rod velocity limiter is a part of each control rod and limits the velocity at which a control rod can fall out of the core should it become detached from its control rod drive. The rate of reactivity insertion resulting from a rod drop accident is limited by this feature. The limiters contain no moving parts.

1.2.2.4.14 Control Rod Drive Housing Supports

Control rod drive housing supports are located underneath the reactor vessel near the control rod housings. The supports limit the travel of a control rod in the event that a control rod housing is ruptured. The supports prevent a nuclear excursion as a result of a housing failure, thus protecting the fuel barrier.

1.2.2.4.15 Reactor Building Recirculation and Standby Gas Treatment Systems

The Reactor Building Recirculation System and the Standby Gas Treatment System (SGTS) are both a part of the secondary containment. The recirculation system has the capability of recirculating the reactor building air volume prior to its discharge via the SGTS, following a LOCA. Under normal wind conditions, the SGTS has the capability of maintaining a negative pressure within the reactor building with respect to the outside atmosphere. The air moving through the SGTS is filtered and discharged through the turbine building exhaust vent.

1.2.2.4.16 Standby ac Power Supply

The Standby ac Power Supply System consists of four diesel-generator sets. The diesel-generators are sized so that three diesels can supply all the necessary power requirements for one unit in the design basis accident condition, plus the necessary required loads to effect the safe shutdown of the second unit. The diesel generators are specified to start up and attain rated voltage and frequency within 10 seconds. Four independent 4 kV engineered safety feature switchgear assemblies are provided for each reactor unit. Each diesel-generator feeds an independent 4 kV bus for each reactor unit.

Additionally, a spare diesel generator is provided which can be manually realigned as a replacement for any one of the other four diesel generators. This spare diesel generator has the emergency loading capability of any of the other four diesel generators.

Each diesel-generator starts automatically upon loss of off-site power or detection of a nuclear accident. The necessary engineered safety feature system loads are applied in a preset time sequence. Each generator operates independently and without paralleling during a loss of off-site power or LOCA signal.

1.2.2.4.17 dc Power Supply

Each reactor unit is provided with four independent 125 V and two independent 250 V dc systems. Each dc system is supplied from a separate battery bank and battery charger. The 125 V dc systems are provided to supply station dc control power and dc power to four diesel generators and their associated switchgears. The 250 V dc systems are provided to supply power required for the larger loads such as dc motor driven pumps and valves.

Additionally, a separate 125V dc system is provided for the spare diesel generator. This separate 125V dc system is provided to supply dc control power and dc power to the spare diesel generator auxiliaries and its associated switchgear.

The 125 and 250-V dc Systems are designed to supply power adequate to satisfy the engineered safety feature load requirements of the unit with the postulated loss of off-site power and any concurrent single failure in the dc system.

1.2.2.4.18 Residual Heat Removal Service Water System

A Residual Heat Removal Service Water System is provided to remove the heat rejected by the Residual Heat Removal System during shutdown operation and accident conditions.

1.2.2.4.19 Emergency Service Water System

The Emergency Service Water System supplies water to cool the standby diesel-generators and the ECCS and Engineered Safety Features equipment rooms, and other essential heat loads.

1.2.2.4.20 Main Steam Line Radiation Monitoring System

The Main Steam Line Radiation Monitoring System consists of four gamma radiation monitors located external to the main steam lines just outside of the primary containment. The monitors are designed to detect a gross release of fission products from the fuel. Upon detection of high radiation, an alarm signal is initiated. A trip signal to the Mechanical Vacuum Pump (MVP) and its suction valves is generated by the monitors upon detection of a high high radiation signal.

1.2.2.4.21 Reactor Building Ventilation Radiation Monitoring System

The Reactor Building Ventilation Radiation Monitoring System consists of a number of radiation monitors arranged to monitor the activity level of the ventilation exhaust from the reactor building. Upon detection of high radiation, the reactor building is automatically isolated and the Standby Gas Treatment System is started.

1.2.2.4.22 Nuclear Leak Detection System

The Nuclear Leak Detection System consists of temperature, pressure, flow, and fission-product sensors with associated instrumentation and alarms. This system detects and annunciates leakage in the following systems:

1) Main steam lines

2) Reactor water cleanup (RWCU) system

3) Residual heat removal (RHR) system

4) Reactor core isolation cooling (RCIC) system

5) High pressure coolant injection (HPCI) system

6) Instrument lines

Small leaks generally are detected by temperature and pressure changes, fillup rate of drain sumps, and fission product concentration inside the primary containment. Large leaks are also detected by changes in reactor water level and changes in flow rates in process lines.

1.2.2.5 Instrumentation and Control

1.2.2.5.1 Nuclear System Process Control and Instrumentation

1.2.2.5.1.1 Reactor Manual Control System

The Reactor Manual Control System provides the means by which control rods are manipulated from the control room for gross power control. The system controls valves in the Control Rod Drive Hydraulic System. Only one control rod can be manipulated at a time. The Reactor Manual Control System includes the controls that restrict control rod movement (rod block) under certain conditions as a backup to procedural controls.

1.2.2.5.1.2 Recirculation Flow Control System

The Recirculation Flow Control System controls the speed of the reactor recirculation pumps. Adjusting the pump speed changes the coolant flow rate through the core. This effects changes in core power level. The system is arranged to automatically adjust reactor power output to the load demand by adjusting the frequency of the electrical power supply for the reactor recirculation pumps.

1.2.2.5.1.3 Neutron Monitoring System

The Neutron Monitoring System is a system of in-core neutron detectors and out-of-core electronic monitoring equipment. The system provides indication of neutron flux, which can be correlated to thermal power level for the entire range of flux conditions that may exist in the core. The system also provides detection of neutron flux oscillations, which may indicate thermal-hydraulic instability. The source range monitors (SRM) and the intermediate range monitors (IRM) provide flux level indications during reactor startup and low power operation.

The local power range monitors (LPRM), oscillation power range monitors (OPRM) and average power range monitors (APRM) allow assessment of local and overall flux conditions during power range operation. The average power range monitors also provide post-accident neutron flux information. A rod block monitor (RBM) is provided to prevent rod withdrawal when reactor power should not be increased at the existing reactor coolant flow rate. The Traversing In-core Probe System (TIPS) provides a means to calibrate the individual LPRM's.

1.2.2.5.1.4 Refueling Interlocks

A system of interlocks, restricting the movements of refueling equipment and control rods when the reactor is in the refuel mode, is provided to prevent an inadvertent criticality during refueling operations. The interlocks back up procedural controls that have the same objective. The interlocks affect the refueling bridge, the refueling bridge hoists, the fuel grapple and control rods.

1.2.2.5.1.5 Reactor Vessel Instrumentation

In addition to instrumentation provided for the nuclear safety systems and engineered safety features, instrumentation is provided to monitor and transmit information that can be used to assess conditions existing inside the reactor vessel and the physical condition of the vessel itself. The instrumentation provided monitors reactor vessel pressure, water level, temperature, internal differential pressures and coolant flow rates, and top head flange leakage.

1.2.2.5.1.6 Process Computer System

An on-line process computer is provided to monitor and log process variables and to make certain analytical computations. In conjunction with approved operating procedure, the rod worth minimizer function prevents improper rod withdrawal under low power conditions. The effect of the rod worth minimizer function is to limit the reactivity worth of the control rods by enforcing adherence to the preplanned rod pattern.

1.2.2.5.1.7 Remote Shutdown System

A Remote Shutdown Panel and associated procedures are provided for each unit so that the plant can be maintained in a safe shutdown condition in the event that the main control room becomes uninhabitable.

1.2.2.5.2 Power Conversion Systems Process Control and Instrumentation

1.2.2.5.2.1 Pressure Regulator and Turbine Control

The pressure regulator maintains control of turbine control valves; it regulates pressure at the turbine inlet and, therefore, the pressure of the entire nuclear system. Pressure regulation is coordinated with the turbine speed system and the load control system so that rapid control valve closure can be initiated when necessary to provide turbine overspeed protection for large load rejection.

1.2.2.5.2.2 Feedwater System Control

A three-element control system regulates the Feedwater System so that proper water level is maintained in the reactor vessel. Signals used by the control system are main steam flow rate, reactor vessel water level, and feedwater flow rate. The feedwater control signal is used to control the speed of the steam turbine-driven feedwater pumps.

1.2.2.5.2.3 Electrical Power System Control

Controls for the electrical power system are located in the control room to permit safe startup, operation, and shutdown of the plant.

1.2.2.6 Electrical Systems

1.2.2.6.1 Transmission and Generation Systems

Redundant sources of off-site power are provided to each unit by separate transmission lines to ensure that no single failure of any active component can prevent a safe and orderly shutdown. The two independent off-site sources provide auxiliary power for startup and for operating the engineered safety feature systems.

The main generator for each unit is an 1800-rpm, three-phase, 60-cycle synchronous machine rated at 1354 MVA. Each generator is connected directly to the turbine shaft and is equipped with an excitation system coupled directly to the generator shaft.

Power from the generators is stepped up from 24 kV to 230 kV on Unit No. 1 and from 24 kV to 500 kV on Unit No. 2 by the unit main transformers and supplied by overhead lines to the 230 kV and 500 kV switchyards, respectively.

1.2.2.6.2 Electric Power Distribution Systems

The electric power distribution system includes Class 1E and non-Class 1E ac and dc power systems. The class 1E power system supplies all safety related equipment and some non-class 1E loads while the non-Class 1E system supplies the balance of plant equipment.

The Class 1E ac system for each unit consists of four independent load groups. Two independent off-site power systems provide the normal electric power to these groups. Each load group includes 4.16 kV switchgear, 480 V load centers, motor control centers and 120 V control and instrument power panel. The vital ac instrumentation and control power supply systems include battery systems, static inverters. Voltages listed are nominal values, and all electrical equipment essential to safety is designed to accept a range of ±10 percent in voltage.

Four independent diesel generators are shared between the two units. Additionally, a spare diesel generator is provided which can be manually realigned as a replacement for any one of the other four diesel generators. This spare diesel generator has the emergency loading capability of any of the other four diesel generators. Each diesel generator is provided as a standby source of emergency power for one of the four Class 1E ac load groups in each unit.

Assuming the total loss of off-site power and failure of one diesel generator, the remaining diesel generators have sufficient capacity to operate all the equipment necessary to prevent undue risk to public health and safety in the event of a design basis accident on one unit and a forced shutdown of the second unit.

The non-Class 1E ac system includes 13.8 kV switchgear, 4.16 kV switchgear, 480 V load centers and motor control centers.

Four independent Class 1E 125V dc batteries and two independent Class 1E 250V dc batteries and associated battery chargers provide direct current power for the Class 1E dc loads of each unit. Power for non-Class 1E dc loads is supplied from the Class 1E 125 and 250 V batteries. An additional circuit breaker is provided for each non-class 1E load connected to the class 1E system for redundant fault protection.

Additionally, a separate 125V dc system is provided for the spare diesel generator. This separate 125V dc system is provided to supply dc control power and dc power to spare diesel generator auxiliaries and its associated switchgear.

These systems are discussed in Chapter 8.

1.2.2.7 Fuel Handling and Storage Systems

1.2.2.7.1 New and Spent Fuel Storage

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1.2.2.7.2 Fuel Pool Cooling and Cleanup System

A Fuel Pool Cooling and Cleanup System is provided to remove decay heat from spent fuel stored in the fuel pool and to maintain specified water temperature, purity, clarity, and level.

1.2.2.7.3 Fuel Handling Equipment

The major fuel servicing and handling equipment includes the reactor building cranes, the refueling service platform, fuel and control rod servicing tools, fuel sipping and inspection devices, and other auxiliary servicing tools.

1.2.2.8 Cooling Water and Auxiliary Systems

1.2.2.8.1 Service Water System

The Service Water System is designed to

a) Furnish cooling water to various heat exchangers located in the several plant buildings

b) Furnish water for diluting the oxidizing and non-oxidizing biocides and for injecting them into the circulating water systems. This is an intermittent service.

The system consists of three 50 percent capacity pumps with associated piping and valves. The cooling water supply to the pumps is taken from the cooling tower basin while the water being returned from the system is discharged into the cooling tower that acts as the heat sink. Equipment that requires service water and is common to Units 1 and 2 is provided with inter-ties to both service water systems so that either can provide the water.

1.2.2.8.2 Residual Heat Removal Service Water System (RHRSWS)

The objective of the RHRSWS is to provide a reliable supply of cooling water for heat removal from the Residual Heat Removal System under post-accident conditions and supply a source of water if post-accident flooding of the core or primary containment is required.

The system consists of two independent loops per unit, each of 100 percent capacity, and each loop consisting of two pumps, valves, piping and controls. Each loop uses the common spray pond with its spray distribution network as a heat sink.

During operation the pumps take water from the spray pond and circulate it through the tube side of the RHR heat exchangers. The warm water is returned to the spray pond through a network of spray nozzles that produce the cooling effect by causing an enthalpy gradient as a result of the convective heat transfer and partial evaporative cooling of the spray droplets. A radiation monitor is provided to check the radioactivity of the service water leaving each RHR heat exchanger. In the event of a high activity level (a tube leak in the RHR heat exchanger), an alarm will sound and the operator will make the decision to isolate the heat exchanger and minimize the volume of contaminated water that flows to the spray pond.

1.2.2.8.3 Emergency Service Water System (ESWS)

The objective of the ESWS is to supply cooling water to the RHR pumps and associated room coolers during normal and emergency conditions, as necessary, to safely shutdown the reactor or support normal and emergency conditions, as necessary, to safely shutdown the reactor or support "hot standby" conditions and in addition supply cooling water to the Diesel-Generator Units. The ESWS provides a reliable supply of cooling water to emergency equipment under a loss of off-site power condition or LOCA. The system consists of two independent loops supplying both units supplying both units (denoted "A" and "B") each of 100 percent capacity and containing two pumps, valves, piping and controls. Each loop uses the spray pond with its spray distribution system (common to both the Emergency Service Water and RHR Service Water Systems) as a heat sink. The ESWS is designed with sufficient redundancy so that no single active or passive system component failure can prevent it from achieving its safety objective. During operation, the ESWS pumps take water from the spray pond and circulate it through the various heat exchangers in the system. The warm water is returned to the spray pond through either a network of spray nozzles or directly through piping that bypass the spray arrays. The spray nozzles produce the cooling effect by causing an enthalpy gradient as a result of the convective heat transfer and partial evaporative cooling of the spray droplets.

1.2.2.8.4 Reactor Building Closed Cooling Water System

The Reactor Building Closed Cooling Water System is designed to accomplish the following objectives:

a) Provide cooling water to auxiliary plant equipment associated with the nuclear system and located in the reactor and radwaste buildings.

b) Provide cooling water to reactor building chilled water system in the event of unavailability of the chillers or loss of off-site power.

The Reactor Building Closed Cooling Water System consists of two 100 percent capacity pumps, two 100 percent capacity heat exchangers, a head tank, chemical addition tank, associated piping, valves and controls. The reactor building cooling water system is a closed loop cooling water system using inhibited demineralized water. The systems for Units 1 and 2 are separate from each other.

During normal plant operation one pump and heat exchanger will be in service, transferring heat to the service water system, with the other pump on automatic standby. Upon complete loss of off-site power, without occurrence of DBA, both cooling water pumps will start automatically when the buses are re-energized by Diesel Generators. The reactor building closed cooling water heat exchangers can be transferred from service water to emergency service water and one pump can be taken out of service, both by remote manual switching.

1.2.2.8.5 Turbine Building Closed Cooling Water System (TBCCWS)

The TBCCWS is designed to provide cooling water to the auxiliary plant equipment associated with the nuclear and power conversion systems in the Turbine Building. The TBCCWS consists of two 100 percent capacity pumps, two 100 percent capacity heat exchangers, a head tank, chemical addition tank, associated piping and valves. The Turbine Building Cooling water System is a closed loop cooling water system using inhibited demineralized water. The systems for Units 1 and 2 are separate from each other. During normal plant operation, the turbine building closed cooling water heat exchanger transfers heat from the Turbine Building Closed Cooling Water System to the Service Water system. After a loss of off-site power, the pumps start automatically the pumps start automatically and the turbine building closed cooling water heat exchangers can be transferred by remote switching to Emergency Service Water System. The heat load during this period will be rejected to the emergency service water. One turbine building closed cooling water pump and heat exchanger will be normally in service and the other pump will be on automatic standby.

1.2.2.8.6 Standby Liquid Control System

Although not intended to provide rapid reactor shutdown, the Standby Liquid Control System provides a redundant, independent, and alternative method to the control rods to bring the reactor subcritical and to maintain it subcritical as the reactor cools. The system makes possible an orderly and safe shutdown if not enough control rods can be inserted into the reactor core to accomplish normal shutdown. The system is sized to counteract the positive reactivity effect from rated power to the cold shutdown condition.

The system will also be used to buffer suppression pool pH to prevent iodine re-evolution following a postulated design basis loss of coolant accident.

1.2.2.8.7 Fire Protection System

A Fire Protection System supplies fire fighting water to points throughout the plant. In addition, automatic Halon and carbon dioxide protection systems and portable fire extinguishers are also provided.

1.2.2.8.8 Plant Heating, Ventilating, and Air-Conditioning Systems

The Plant Heating, Ventilating, and Air-Conditioning Systems supply and circulate filtered fresh air for personnel comfort and equipment cooling.

1.2.2.8.9 Compressed Air System

The Compressed Air Systems (e.g., instrument air, service air and containment instrument air) supply air of suitable quality and pressure for various plant operations.

1.2.2.8.10 Makeup Water Treatment System

A Makeup Water Treatment System furnishes a supply of treated water suitable for use as makeup for the plant.

1.2.2.8.11 Domestic and Sanitary Water Systems

A water system for drinking and sanitary uses is provided for the plant.

1.2.2.8.12 Plant Equipment and Floor Drainage Systems

The Plant Equipment and Floor Drainage System handles both radioactive and non-radioactive drains. Drains which may contain radioactive materials are pumped to the radwaste system for cleanup, reuse, or discharge. Non-radioactive drains are discharged to the environs.

1.2.2.8.13 Process Sampling System

The Process Sampling System is provided to monitor the operation of plant equipment and to provide information needed to make operational decisions.

1.2.2.8.14 Plant Communication System

The Plant Communication System provides communication between various plant buildings and locations.

1.2.2.8.15 Process Valve Stem Leakoff System

The Process valve stem leak-off collection system is designed to reduce and control leakage to the atmosphere from valves greater than 2 1/2 in. that are used in the turbine building in systems containing radioactive steam or water and not connected to the main condenser.

Valves in the turbine building were originally provided with valve stem packing leakoff connections. Research and testing has shown that improved packing provides an effective seal to prevent leakage into the Turbine Building. As a result, these leakoff connections are in the process of being removed and package configurations changed, as appropriate, to conform with the new requirements. As part of this effort, leakoff isolation valves and piping will be removed (or abandoned in place) and the leakoff collection header piping will be removed or abandoned in place.

1.2.2.8.16 Diesel Auxiliary Systems

Diesel auxiliary systems are those systems which directly support operation of the emergency diesel generators. The following are diesel auxiliary systems:

a) Diesel Generator Fuel Oil Storage and Transfer System

b) Diesel Generator Cooling Water System

c) Diesel Generator Starting System

d) Diesel Generator Lubrication System

e) Diesel Generator Combustion Air Intake and Exhaust System

1.2.2.8.17 Auxiliary Steam System

The auxiliary steam system consists of two electrode steam boilers and auxiliary equipment. The system is designed to provide flexibility for accommodating varying steam demands during all operating modes.

1.2.2.9 Power Conversion System

1.2.2.9.1 Turbine-Generator

The turbine-generator consists of the turbine, generator, exciter, controls, and required subsystems designed for a nominal plant rating output of 1300 MWe for both Unit 1 and Unit 2.

Each turbine is an 1800 rpm, tandem-compound, six-flow, non-reheat unit with an electrohydraulic control system. The main turbine comprises one double-flow high pressure turbine and three double-flow low pressure turbines. Exhaust steam from the high pressure turbine passes through moisture separators before entering the three low pressure turbines

The generator is a direct-driven, three-phase, 60 Hz, 24,000 V, 1800 rpm, conductor-cooled, synchronous generator rated on the basis of guaranteed best turbine efficiency MW rating at 0.935 power factor, 75 psig hydrogen pressure. The generator-exciter system is shaft-driven, complete with static type voltage regulator and associated switchgear. The following are the turbine generator auxiliary systems:

a) Generator Hydrogen System
b) Generator Seal Oil System
c) Turbine Lube Oil System
d) Steam Seal System
e) Gland Exhaust System
f) Generator Stator Cooling System

1.2.2.9.2 Main Steam System

The main steam system delivers steam from the nuclear boiler system via four 24 in. OD steam lines to the turbine-generator. This system also supplies steam to the steam jet air ejectors, the reactor feed pump turbines, the main condenser hotwell at startup and low loads, and the steam seal evaporator.

1.2.2.9.3 Main Condenser

The main condenser is a triple pass, triple-pressure, deaerating type with a reheating-deaerating hotwell and divided water boxes. The condenser consists of three sections, and each section is located below one of three low-pressure turbines. The condensers are supported on the turbine foundation mat, with rubber expansion joints provided between each turbine exhaust opening and the steam inlet connections in the condenser shells.

During normal operation, steam from the low pressure turbine is exhausted directly downward into the condenser shells through exhaust openings in the bottom of the turbine casings and is condensed. The condenser also serves as a heat sink for several other flows, such as exhaust steam from feed condenser drain, gland seal condenser drain, feedwater heater shell operating vents, and condensate pump suction vents.

During abnormal conditions the condenser is designed to receive (not simultaneously) turbine bypass steam, feedwater heater high level dump(s), and relief valve discharge (from crossover steam lines, feedwater heater shells, steam seal regulator, and various steam supply lines).

Other flows occur periodically; they originate from condensate pump and reactor feed pump startup vents, reactor feed pump and condensate pump minimum recirculation flows, feedwater line startup flushing, turbine equipment clean drains, low point drains, deaerating steam, makeup, condensate, etc.

1.2.2.9.4 Main Condenser Gas Removal System

The main condenser Gas Removal System removes the non-condensable gases from the main condenser and exhausts them to the Off-Gas System. One steam jet air ejector (100 percent capacity), is provided for the removal of air and radiolysis gases during normal operation. One motor-driven mechanical vacuum pump is to establish or maintain vacuum during startup and shutdown.

1.2.2.9.5 Steam Seal System

The steam seal system provides clean, non-radioactive steam to the seals of the turbine valve packings and the turbine shaft packings. The sealing steam is supplied by the seal steam evaporator. The auxiliary boiler provides an auxiliary steam supply for startup and when the seal steam evaporator is not operating.

1.2.2.9.6 Steam Bypass and Pressure Control System

The turbine steam bypass and pressure control system control the reactor pressure for the following operating modes:

a) During reactor heatup to rated pressure.

b) While the turbine is being brought up to speed and synchronized.

c) During transient power operation when the reactor steam generation exceeds the turbine steam requirements.

d) When cooling down the reactor.

1.2.2.9.7 Circulating Water System

The Circulating Water system is a closed loop system designed to circulate the flow of water required to remove the heat load from the main condenser and auxiliary heat exchanger equipment and discharge it to the atmosphere through a natural draft cooling tower.

1.2.2.9.8 Condensate Cleanup System

The function of the Condensate Cleanup System is to maintain the required purity of the feedwater flowing to the reactor.

The system consists of full flow deep bed demineralizers using ion exchange resins which remove dissolved and a portion of the suspended solids from the feedwater to maintain the purity necessary for the reactor. The demineralizers will also remove some of the radioactive material produced by corrosion as well as fission product carryover from the reactor. The radioactivity from these sources does not have a significant effect on the resins.

1.2.2.9.9 Condensate and Feedwater System

The Condensate and Feedwater System is designed to deliver the required feedwater flow to the reactor vessels during stable and transient operating conditions throughout the entire operating range from startup to full load to shutdown. The system operates using four condensate pumps to pump deaerated condensate from the hotwell of the main condenser through the steam jet air ejector condenser, the gland steam condenser, the condensate filters, and thence to the condensate demineralizer. The demineralized feedwater then flows through three parallel strings of feedwater heaters, each string consisting of five heaters, to the suction of three reactor feed pumps which deliver the feedwater to the reactor.

1.2.2.9.10 Condensate and Refueling Water Storage and Transfer System

The function of the Condensate and Refueling Water Storage and Transfer System is to store condensate to be used as follows:

a) Supply water for the RCIC and HPCI systems.

b) Maintain the required condensate level in the hotwell either by receiving excess condensate rejected from the main condensate system or by supplying condensate to the main condensate system to makeup for a deficiency.

c) Fill up the reactor well of either reactor during refueling and receive this water back for storage after it has been cleaned up by the demineralizer.

d) Provide condensate where required for miscellaneous equipment in the radwaste building and both reactor buildings.

The makeup to condensate storage tanks and the refueling storage tank is provided by the demineralized water storage tank.

1.2.2.10 Radioactive Waste Systems

The Radioactive Waste Systems are designed to confine the release of plant produced radioactive material to well within the limits specified in 10CFR20. Various methods are used to achieve this end, e.g. collection, filtration, holdup for decay, dilution and concentration.

1.2.2.10.1 Liquid Radwaste System

The Liquid Radwaste System collects, treats, stores, and disposes of all radioactive liquid wastes. These wastes are collected in sumps and drain tanks at various locations throughout the plant and then transferred to the appropriate collection tanks in the radwaste building prior to treatment, storage and disposal. Processed liquid wastes are returned to the Condensate System, packaged for offsite shipment, or discharged from the plant.

Equipment is selected, arranged, and shielded to permit operation, inspection, and maintenance within radiation allowances for personnel exposure. For example, tanks and processing equipment which will contain significant radiation sources are shielded and sumps, pumps, instruments, and valves are located in controlled access rooms or spaces. Processing equipment is selected and designed to require a minimum of maintenance.

Valving redundancy, instrumentation for detection, alarms of abnormal conditions, and procedural controls protect against the accidental discharge of liquid radioactive waste.

1.2.2.10.2 Solid Radwaste System

Solid wastes originating from nuclear system equipment are stored for radioactive decay in the fuel storage pool and prepared for reprocessing or off-site storage in approved shipping containers. Examples of these wastes are spent control rods, and in-core ion chambers.

Process solid wastes as applicable are collected, dewatered, solidified, packaged, and stored in shielded compartments prior to off-site shipment. Examples of these solid wastes are filter residue, spent resins, paper, air filters, rags, and used clothing.

If off-site shipment of solidified liners or dry active waste is not practicable, these items may be temporarily stored at the Low Level Radioactive Waste Holding Facility, as described in Section 11.6, provided they are packaged for off-site disposal.

1.2.2.10.3 Gaseous Radwaste System

Radioactive gaseous wastes are discharged to the reactor building vent via the Gaseous Radwaste System. This system provides hydrogen-oxygen recombination, filtration, and holdup of the off-gases to ensure a low rate of release from the reactor building vent.

The off-gases from the main condenser are the greatest source of gaseous radioactive waste. The treatment of these gases reduces the released activity to below permissible levels.

1.2.2.11 Radiation Monitoring and Control

1.2.2.11.1 Process Radiation Monitoring

Radiation monitors are provided on various lines to monitor for radioactive materials released to the environs via process liquids and gases or for detection of process system malfunctions. These monitors annunciate alarms and/or provide signals to initiate isolation and corrective actions.

1.2.2.11.2 Area Radiation Monitors

Radiation monitors are provided to monitor for abnormal radiation at various locations in the reactor building, turbine building, and radwaste building. These monitors annunciate alarms when abnormal radiation levels are detected.

1.2.2.11.3 Site Environs Radiation Monitors

Radiation monitors are provided outside the plant buildings to monitor radiation levels. These data are used for determining the contribution of plant operations to on-site and off-site radiation levels.

1.2.2.11.4 Liquid Radwaste System Control

Liquid wastes to be discharged are handled on a batch basis with protection against accidental discharge provided by procedural controls. Instrumentation, with alarms, to detect abnormal concentration of the radwastes, is provided.

1.2.2.11.5 Solid Radwaste Control

The Solid Radwaste System collects, treats, and prepares solid radioactive wastes for off-site shipment. Wastes are handled on a batch basis. Radiation levels of the various batches are determined by the operator.

1.2.2.11.6 Gaseous Radwaste System Control

The Gaseous Radwaste System is continuously monitored by the turbine building vent radiation monitor and the off-gas pre-treatment radiation monitor. A high level signal will annunciate alarms.

1.2.2.12 Shielding

Shielding is provided throughout the plant, as required, to reduce radiation levels to operating personnel and to the general public within the applicable limits set forth in 10CFR20 and 10CFR50. It is also designed to protect certain plant components from radiation exposure resulting in unacceptable alterations of material properties or activation.

1.2.2.13 Steam Dryer Storage

A separate Steam Dryer Storage Facility(SDSF) is provided within the plant protected area for the storage, shielding, and radioactive decay of replaced Reactor steam dryers. The steam dryers are cut in half and packaged into steel containers for storage in the SDSF. They are not considered as radioactive waste but are treated as irradiated plant equipment. The SDSF is a reinforced concrete vault with removable roof slab access only, meeting 10CFR20 dose limits.

1.2.2.14 FLEX Equipment Storage Building

A separate FLEX Equipment Storage Building is provided within the plant protected area for the storage of portable equipment needed to respond to a Beyond Design Basis External Event (BDBEE). B.5.b equipment (i.e., pumper truck, etc.) is also stored in this building. This is strictly an emergency equipment storage facility (no personnel occupancy amenities) constructed to meet all plant extreme environmental conditions (i.e., seismic, tornado, missile).

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-220, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-1 replaced by dwg. M-220, Sh. 1 FIGURE 1.2-1, Rev. 57

AutoCAD Figure 1_2_1.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-221, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-2 replaced by dwg. M-221, Sh. 1 FIGURE 1.2-2, Rev. 56

AutoCAD Figure 1_2_2.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-222, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-3 replaced by dwg.
M-222, Sh. 1

FIGURE 1.2-3, Rev. 48

AutoCAD Figure 1_2_3.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-223, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-4 replaced by dwg. M-223, Sh. 1 FIGURE 1.2-4, Rev. 48

AutoCAD Figure 1_2_4.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-224, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-5 replaced by dwg. M-224, Sh. 1 FIGURE 1.2-5, Rev. 48

AutoCAD Figure 1_2_5.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-225, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-6 replaced by dwg.
M-225, Sh. 1

FIGURE 1.2-6, Rev. 48

AutoCAD Figure 1_2_6.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-226, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-7 replaced by dwg.
M-226, Sh. 1

FIGURE 1.2-7, Rev. 48

AutoCAD Figure 1_2_7.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-227, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-8 replaced by dwg.
M-227, Sh. 1

FIGURE 1.2-8, Rev. 48

AutoCAD Figure 1_2_8.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-230, Sh. 1

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-9 replaced by dwg.
M-230, Sh. 1

FIGURE 1.2-9, Rev. 57

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-231, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-10 replaced by dwg. M-231, Sh. 1 FIGURE 1.2-10, Rev. 49

AutoCAD Figure 1_2_10.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-232, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-11 replaced by dwg. M-232, Sh. 1 FIGURE 1.2-11, Rev. 48

AutoCAD Figure 1_2_11.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-233, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-12 replaced by dwg. M-233, Sh. 1 FIGURE 1.2-12, Rev. 49

AutoCAD Figure 1_2_12.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-234, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-13 replaced by dwg.
M-234, Sh. 1

FIGURE 1.2-13, Rev. 48

AutoCAD Figure 1_2_13.doc

THiS FIGURE HAS BEEN
REPLACED BY DWG.
M-235, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-14 replaced by dwg. M-235, Sh. 1 FIGURE 1.2-14, Rev. 48

AutoCAD Figure 1_2_14.doc

THiS FIGURE HAS BEEN
REPLACED BY DWG.
M-236, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-15 replaced by dwg. M-236, Sh. 1 FIGURE 1.2-15, Rev. 48

AutoCAD Figure 1_2_15.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-237, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-16 replaced by dwg. M-237, Sh. 1 FIGURE 1.2-16, Rev. 48

AutoCAD Figure 1_2_16.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-240, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-17 replaced by dwg.
M-240, Sh. 1

FIGURE 1.2-17, Rev. 48

AutoCAD Figure 1_2_17.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-241, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-18 replaced by dwg.
M-241, Sh. 1

FIGURE 1.2-18, Rev. 55

AutoCAD Figure 1_2_18.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-242, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-19 replaced by dwg.
M-242, Sh. 1

FIGURE 1.2-19, Rev. 48

AutoCAD Figure 1_2_19.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-243, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-20 replaced by dwg. M-243, Sh. 1 FIGURE 1.2-20, Rev. 55

AutoCAD Figure 1_2_20.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-244, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-21 replaced by dwg. M-244, Sh. 1 FIGURE 1.2-21, Rev. 56

AutoCAD Figure 1_2_21.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-245, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-22 replaced by dwg.
M-245, Sh. 1

FIGURE 1.2-22, Rev. 48

AutoCAD Figure 1_2_22.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-246, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-23 replaced by dwg. M-246, Sh. 1 FIGURE 1.2-23, Rev. 48

AutoCAD Figure 1_2_23.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-247, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-24 replaced by dwg. M-247, Sh. 1 FIGURE 1.2-24, Rev. 48

AutoCAD Figure 1_2_24.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-248, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-25 replaced by dwg. M-248, Sh. 1 FIGURE 1.2-25, Rev. 48

AutoCAD Figure 1_2_25.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-249, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-26 replaced by dwg. M-249, Sh. 1 FIGURE 1.2-26, Rev. 48

AutoCAD Figure 1_2_26.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-250, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-27 replaced by dwg.
M-250, Sh. 1

FIGURE 1.2-27, Rev. 48

AutoCAD Figure 1_2_27.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-251, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-28 replaced by dwg. M-251, Sh. 1 FIGURE 1.2-28, Rev. 56

AutoCAD Figure 1_2_28.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-252, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-29 replaced by dwg. M-252, Sh. 1 FIGURE 1.2-29, Rev. 48

AutoCAD Figure 1_2_29.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-253, Sh. 1

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-30 replaced by dwg.
M-253, Sh. 1

FIGURE 1.2-30, Rev. 55

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-254, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-31 replaced by dwg. M-254, Sh. 1 FIGURE 1.2-31, Rev. 55

AutoCAD Figure 1_2_31.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-255, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-32 replaced by dwg.
M-255, Sh. 1

FIGURE 1.2-32, Rev. 48

AutoCAD Figure 1_2_32.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-256, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-33 replaced by dwg. M-256, Sh. 1 FIGURE 1.2-33, Rev. 48

AutoCAD Figure 1_2_33.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-257, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-34 replaced by dwg.
M-257, Sh. 1

FIGURE 1.2-34, Rev. 48

AutoCAD Figure 1_2_34.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-258, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-35 replaced by dwg.
M-258, Sh. 1

FIGURE 1.2-35, Rev. 48

AutoCAD Figure 1_2_35.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-259, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-36 replaced by dwg.
M-259, Sh. 1

FIGURE 1.2-36, Rev. 48

AutoCAD Figure 1_2_36.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-260, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-37 replaced by dwg. M-260, Sh. 1 FIGURE 1.2-37, Rev. 48

AutoCAD Figure 1_2_37.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-261, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-38 replaced by dwg. M-261, Sh. 1 FIGURE 1.2-38, Rev. 48

AutoCAD Figure 1_2_38.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-270, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-39 replaced by dwg.
M-270, Sh. 1

FIGURE 1.2-39, Rev. 56

AutoCAD Figure 1_2_39.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-271, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-40 replaced by dwg. M-271, Sh. 1 FIGURE 1.2-40, Rev. 48

AutoCAD Figure 1_2_40.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-272, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-41 replaced by dwg. M-272, Sh. 1 FIGURE 1.2-41, Rev. 48

AutoCAD Figure 1_2_41.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-273, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-42 replaced by dwg. M-273, Sh. 1 FIGURE 1.2-42, Rev. 48

AutoCAD Figure 1_2_42.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-274, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-43 replaced by dwg.
M-274, Sh. 1

FIGURE 1.2-43, Rev. 48

AutoCAD Figure 1_2_43.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-276, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-44 replaced by dwg. M-276, Sh. 1 FIGURE 1.2-44, Rev. 48

AutoCAD Figure 1_2_44.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-280, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-45 replaced by dwg.
M-280, Sh. 1

FIGURE 1.2-45, Rev. 48

AutoCAD Figure 1_2_45.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-281, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

Figure 1.2-46 replaced by dwg.
M-281, Sh. 1

FIGURE 1.2-46, Rev. 48

AutoCAD Figure 1_2_46.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-282, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-47 replaced by dwg. M-282, Sh. 1 FIGURE 1.2-47, Rev. 48

AutoCAD Figure 1_2_47.doc

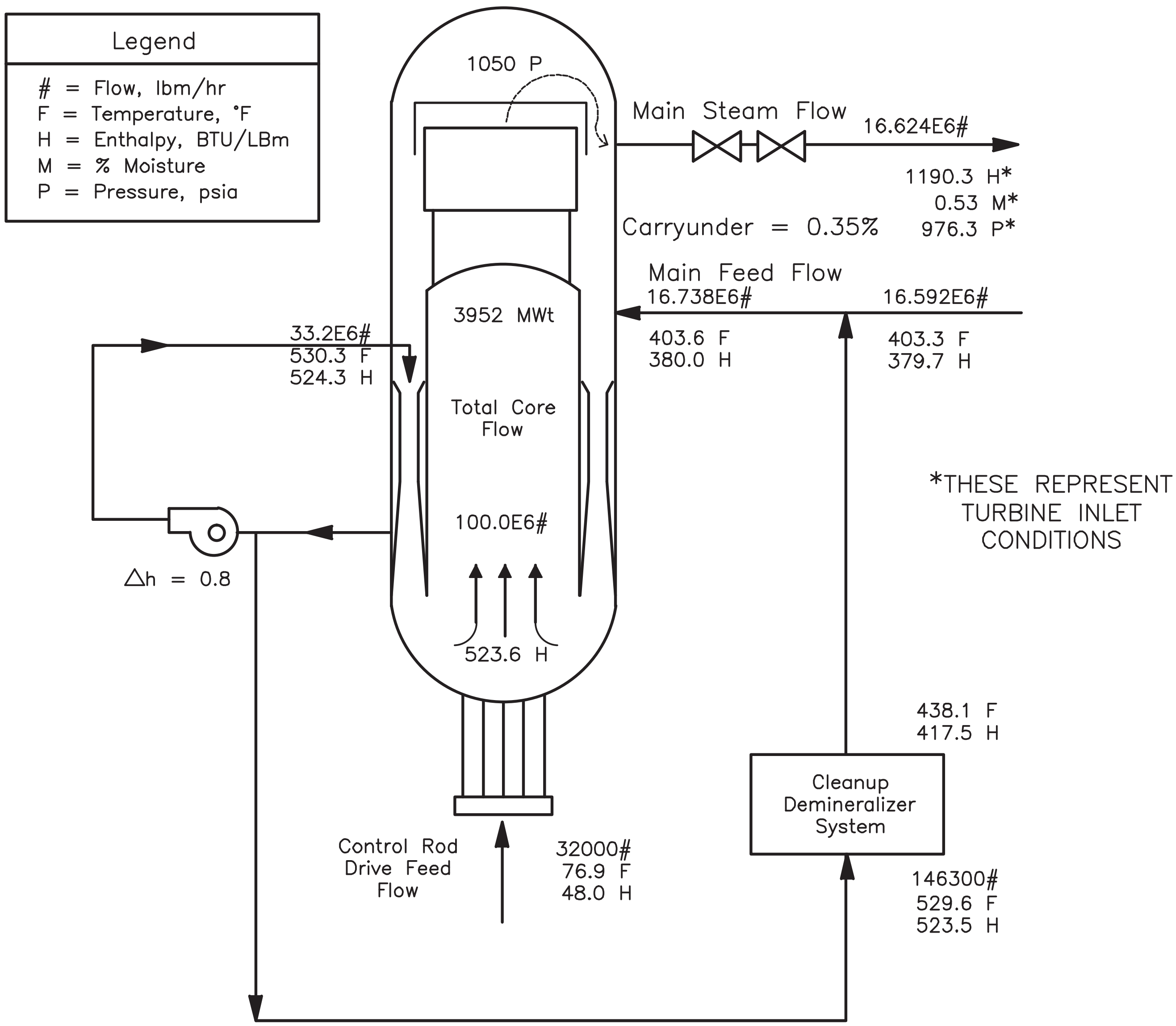
THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-284, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-48 replaced by dwg. M-284, Sh. 1 FIGURE 1.2-48, Rev. 48

AutoCAD Figure 1_2_48.doc

SSES — Reactor Heat Balance



Core Thermal Power	3952.0	MWt
Pump Heating	8.1	
Cleanup Losses	−4.5	
Other System Losses	−2.8	
Turbine Cycle Use	3952.8	MWt

FSAR REV.67

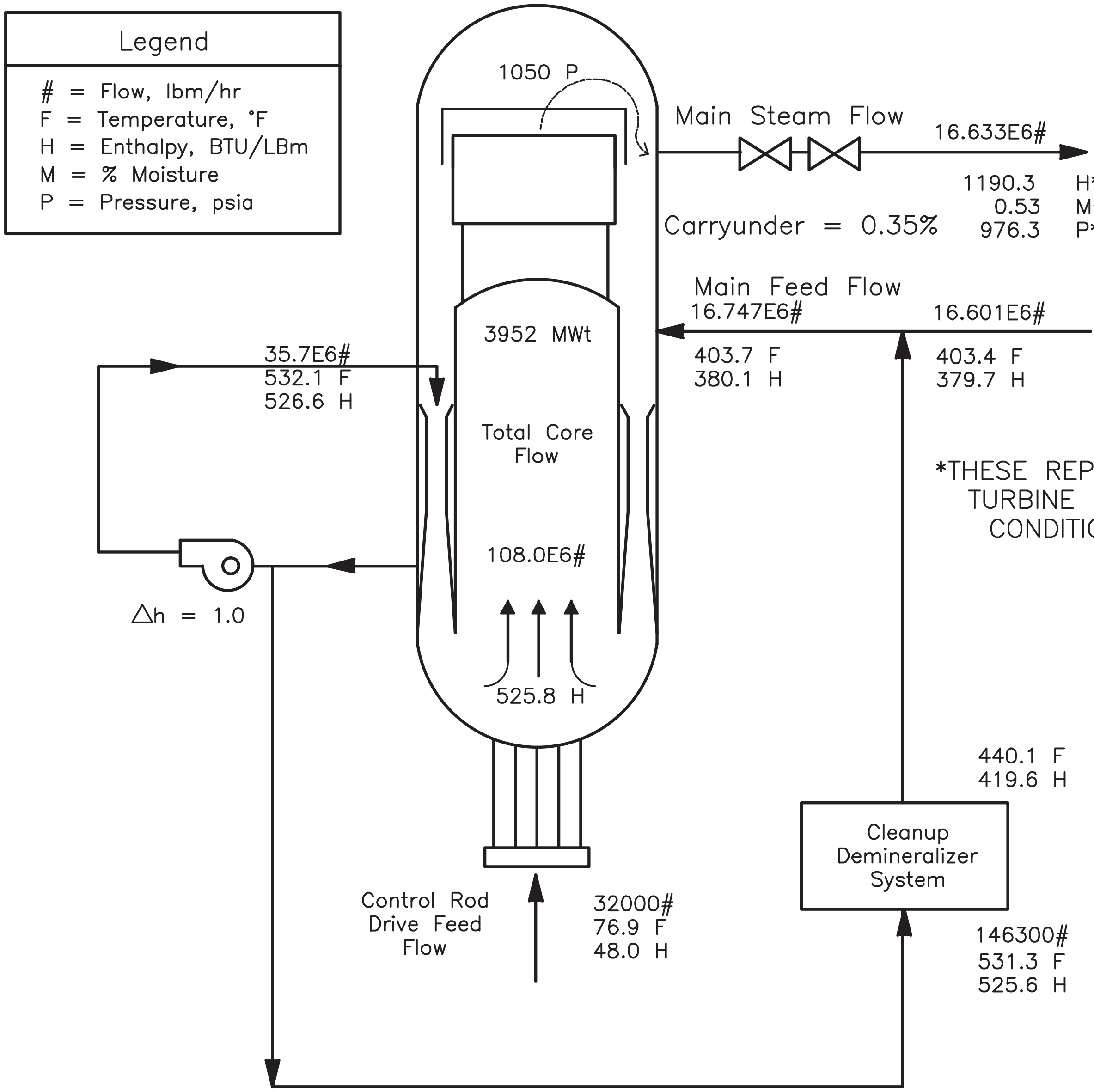
SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

UNIT 1
HEAT BALANCE AT RATED POWER
WITH 100 X 10^6 LBm/hr CORE FLOW

FIGURE 1.2-49, Rev 60

AutoCAD: Figure Fsar 1_2_49.dwg

SSES — Reactor Heat Balance



Core Thermal Power	3952.0	MWt
Pump Heating	10.0	
Cleanup Losses	−4.5	
Other System Losses	−2.8	
Turbine Cycle Use	3954.7	MWt

FSAR REV.67

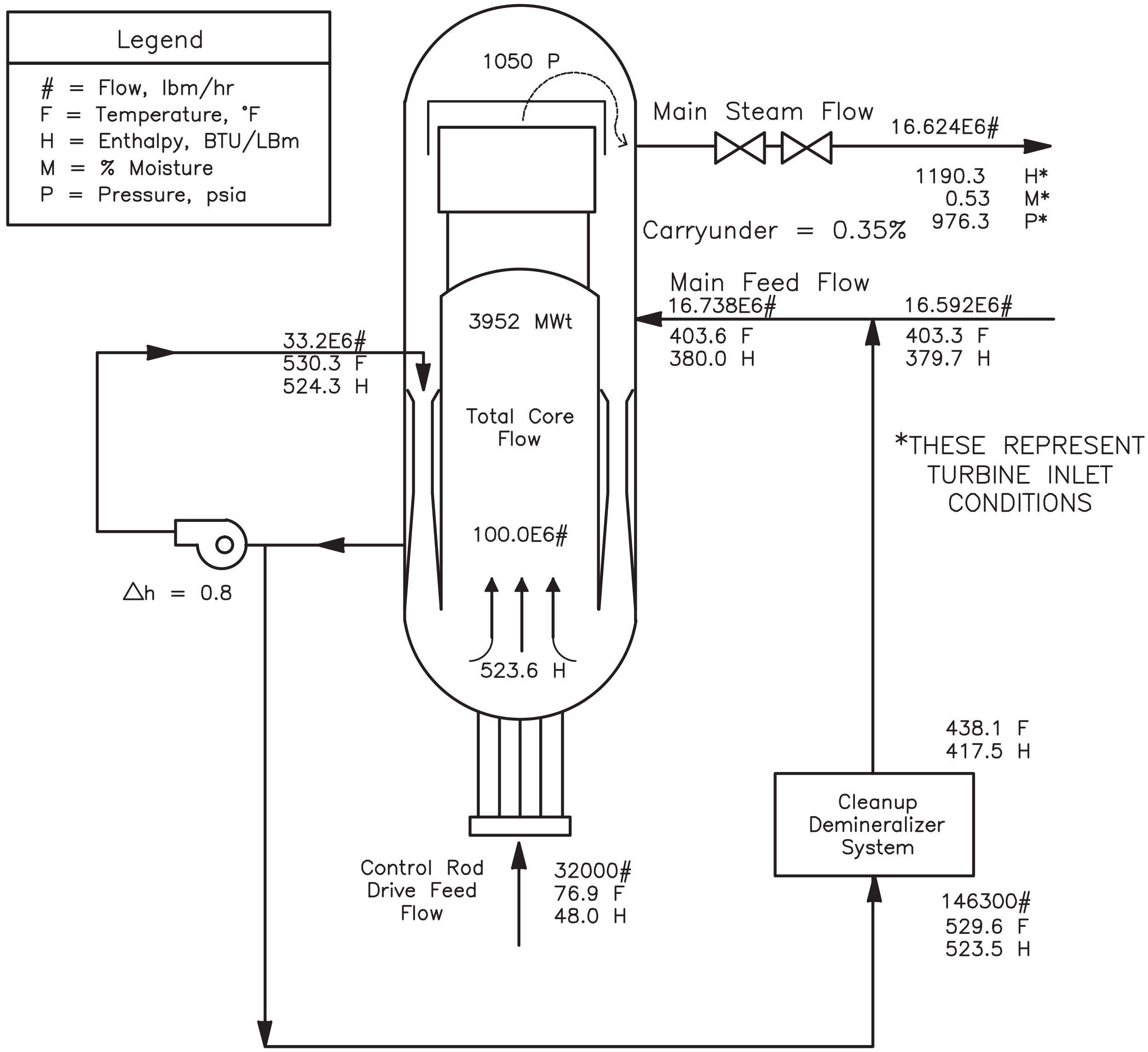
SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

UNIT 1
HEAT BALANCE AT RATED POWER
WITH 108 X 10^6 LBm/hr INCREASED
CORE FLOW

FIGURE 1.2-49-1, Rev 60

AutoCAD: Figure Fsar 1_2_49_1.dwg

SSES — Reactor Heat Balance



Core Thermal Power	3952.0	MWt
Pump Heating	8.1	
Cleanup Losses	−4.5	
Other System Losses	−2.8	
Turbine Cycle Use	3952.8	MWt

FSAR REV.67

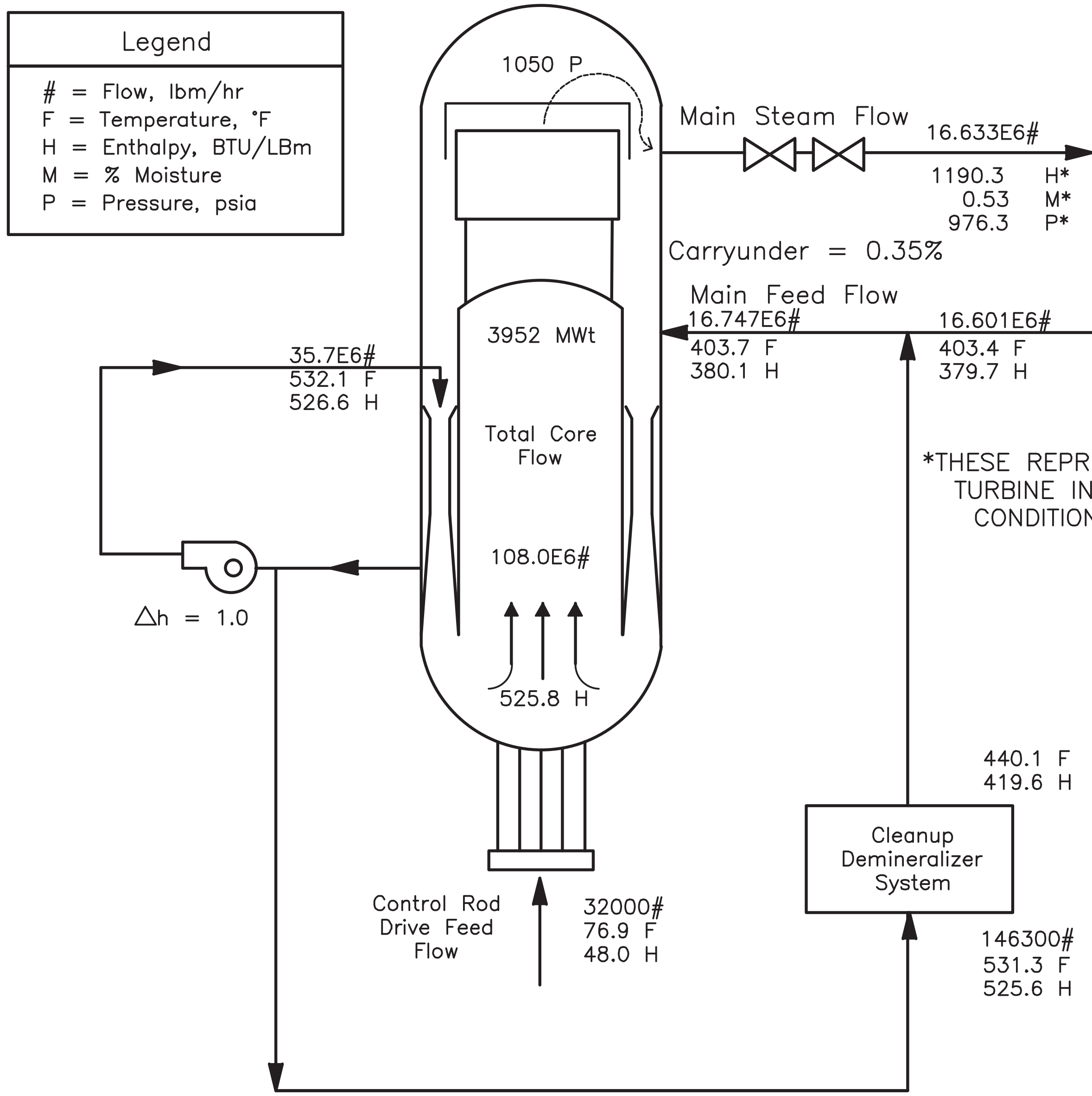
SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

UNIT2
HEAT BALANCE AT RATED POWER
WITH 100 X 10^6LBm/hr CORE FLOW

FIGURE 1.2-49-2, Rev 3

AutoCAD: Figure Fsar 1_2_49_2.dwg

SSES — Reactor Heat Balance



Core Thermal Power	3952.0 MWt
Pump Heating	10.0
Cleanup Losses	−4.5
Other System Losses	−2.8
Turbine Cycle Use	3954.7 MWt

FSAR REV.67

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

UNIT 2
HEAT BALANCE AT RATED POWER
WITH 108 X 10^6 LBm/hr INCREASED
CORE FLOW

FIGURE 1.2-49-3, Rev 3

AutoCAD: Figure Fsar 1_2_49_3.dwg

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-5200, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-50 replaced by dwg. M-5200, Sh. 1 FIGURE 1.2-50, Rev. 52

AutoCAD Figure 1_2_50.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-5200, Sh. 2

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.2-51 replaced by dwg. M-5200, Sh. 2 FIGURE 1.2-51, Rev. 52

AutoCAD Figure 1_2_51.doc

1.3 COMPARISON TABLES

1.3.1 COMPARISONS WITH SIMILAR FACILITY DESIGNS

This subsection highlights the historical principal design features of the plant and compares its major features with other boiling water reactor facilities. The design of this facility was based on proven technology obtained during the development, design, construction, and operation of boiling water reactors of similar types.

The data, performance, characteristics, and other information presented here represent the then current Susquehanna Steam Electric Station design as it compared to similar designs available at that time. To maintain this original design comparison, these tables will not be revised to reflect current plant design, other than the previous addition of the fifth ("E") emergency diesel generator to Tables 1.3-6 and 1.3-7.

1.3.1.1 Nuclear Steam Supply System Design Characteristics

Table 1.3-1 summarizes the design and operating characteristics for the nuclear steam supply systems. Parameters are related to rated power output for a single plant unless otherwise noted.

1.3.1.2 Power Conversion System Design Characteristics

Table 1.3-2 compares the power conversion system design characteristics.

1.3.1.3 Engineered Safety Features Design Characteristics

Table 1.3-3 compares the engineered safety features design characteristics.

1.3.1.4 Containment Design Characteristics

Table 1.3-4 compares the containment design characteristics.

1.3.1.5 Radioactive Waste Management Systems Design Characteristics

Table 1.3-5 compares the radioactive waste management design characteristics.

1.3.1.6 Structural Design Characteristics

Table 1.3-6 compares the structural design characteristics.

1.3.1.7 Instrumentation and Electrical Systems Design Characteristics

Table 1.3-7 compares the instrumentation and electrical systems design characteristics.

1.3.2 COMPARISON OF FINAL AND PRELIMINARY INFORMATION

All of the significant changes that have been made in the facility design between submission of the last PSAR revision and Revision 0 of the FSAR are listed in Table 1.3-8. Each item in Table 1.3-8 is cross-referenced to the appropriate portion of the FSAR which describes the changes and the bases for them.

Table 1.3-1

COMPARISON OF NUCLEAR STEAM SUPPLY SYSTEM DESIGN CHARACTERISTICS

(Parameters are for rated power output for a single plant unless otherwise noted. These parameters were current at issuance of the SSES Operating License and are being maintained for historical reference.)

	SSES BWR 4 251-764	**HATCH 1 BWR 4 218-560**	**ZIMMER BWR 5 28-560**	**GESSAR BWR 6 238-732**
THERMAL AND HYDRAULIC DESIGN				
Rated power, MWt	3293	2436	2436	3579
Design power, MWt (ECCS design basis)	3439	2550	2550	3758
Steam flow rate, lb. hr.	13.48×10^6	10.03×10^6	10.477×10^6	15.396×10^6
Core coolant flow rate, lb/hr.	100.0×10^6	78.5×10^6	78.5×10^6	105.0×10^6
Feedwater flow rate, lb/hr.	13.574×10^6	10.445×10^6	10.477×10^6	15.358
System pressure, nominal in steam dome, psia	1020	1020	1020	1040
Average power density, KW/liter	48.7	51.2	50.51	56.0
Maximum thermal output, KW/ft.	13.4	13.4	13.4	13.4
Average thermal output, KW/ft.	5.34	7.11	5.45	6.04
Maximum heat flux, Btu/hr-ft^2	361,000	428,300	354,000	354,300
Average heat flux, Btu/hr-ft^2	144,100	164,700	143,900	159,600
Maximum UO_2 temperature, °F	3330	4380	3325	3337
Average volumetric fuel temperature, °F	1100	1100	1100	1100
Average cladding surface temperature, °F	558	558	558	558
Minimum critical power ratio (MCPR) * For Hatch minimum critical heat flux (MCHFR) ws used.	1.23	1.9*	1.21	1.24
Coolant enthalpy at core inlet, Btu/lb	521.8	526.2	527.4	527.9
Core maximum exit voids within assemblies	76	79	75	76
Core average exit quality, % steam	13.2	12.9	13.6	14.9
Feedwater temperature, °F	383	387.4	420	420
THERMAL AND HYDRAULIC DESIGN				
Design Power Peaking Factor:				
Maximum relative assembly power	1.40	1.40	1.40	1.40
Local peaking factor	1.15	1.24	1.24	1.13
Axial peaking factor	1.40	1.50	1.40	1.40
Total peaking factor	2.51	2.60	2.43	2.22
NUCLEAR DESIGN (First Core)				
Water/$U0_2$ volume ratio (cold)	2.80	2.53	2.41	2.70
Reactivity with strongest control rod K_{eff}	F0.99	F0.99	F0.99	F0.99
Moderate void coefficient:				
Hot, no voids Δk/k - % void	-1.0×10^{-3}	-1.0×10^{-3}	-1.0×10^{-3}	-0.3×10^{-3}
At rated output, Δk/k - % void	-1.7×10^{-3}	-1.6×10^{-3}	1.6×10^{-3}	-1.0×10^{-5}
Fuel temperature doppler coefficient:				
At 68 °F, Δk/k – °F fuel	-1.2×10^{-5}	1.3×10^{-5}	-1.3×10^{-5}	-1.6×10^{-5}

Table 1.3-1

COMPARISON OF NUCLEAR STEAM SUPPLY SYSTEM DESIGN CHARACTERISTICS

(Parameters are for rated power output for a single plant unless otherwise noted. These parameters were current at issuance of the SSES Operating License and are being maintained for historical reference.)

	SSES BWR 4 251-764	**HATCH 1 BWR 4 218-560**	**ZIMMER BWR 5 28-560**	**GESSAR BWR 6 238-732**
Hot, no voids, Δk/k °F fuel	-1.2×10^{-5}	-1.2×10^{-5}	-1.2×10^{-5}	-1.3×10^{-5}
At rated output, Δk/k,°F fuel	-1.2×10^{-5}	-1.3×10^{-5}	-1.3×10^{-5}	-1.2×10^{-5}
Initial average U-235 enrichment wt. %	1.88	2.23	1.90	1.90
Fuel average discharge exposure, MWd/short ton	16,200	19,000	15,053	13,000
CORE MECHANICAL DESIGN (First Core)				
Fuel Assembly:				
Number of fuel assemblies	764	560	560	732
Fuel rod array	8 x 8	7 x 7	8 x 8	8 x 8
Overall dimensions, in.	176	176	176	176
Weight of $U0_2$ per assembly lb. (pellet type)	458 (chamfered)	490.4 (undished) 483.4 (dished)	465.15	472 (chamfered)
Weight of fuel assembly, lb.	600	681 (undished) 675 (dished)	698	
Fuel Rods:				
Number per fuel assembly	62	49	63	63
Outside diameter, in	0.483	0.563	0.493	0.493
Cladding thickness, in	0.032	0.032	0.034	0.034
Gap, pellet to cladding, in	0.0045	0.006	0.0045	0.009
Length of gas plenum, in	10	16	14	12
Cladding material* *Free-standing loaded tubes	Zircaloy-2	Zircaloy-2	Zircaloy-2	Zircaloy-2
Fuel Pellets:				
Material	$U0_2$	$U0_2$	$U0_2$	$U0_2$
Density, % of theoretical	95	95	95	94
Diameter, in	0.410	0.487	0.416	0.416
Length, in	0.410	0.5	0.420	0.420
Fuel Channel:				
Overall dimension, length, in	166.9	166.9	166.9	
Thickness, in	0.080	0.080	0.100	0.120
Cross section dimensions, in	5.48 x 5.48	5.44 x 5.44	5.48 x 5.48	5.52 x 5.52
Material	Zircaloy-4	Zircaloy-4	Zircaloy-4	Zircaloy-4
Core Assembly:				
Fuel Weight as UO_2, lb	349,000	272,850	250,538	345,500
Core diameter, (equivalent), in	187.1	160.2	160.2	
Core height (active fuel) in	150	144	146	148

Table 1.3-1

COMPARISON OF NUCLEAR STEAM SUPPLY SYSTEM DESIGN CHARACTERISTICS

(Parameters are for rated power output for a single plant unless otherwise noted. These parameters were current at issuance of the SSES Operating License and are being maintained for historical reference.)

	SSES BWR 4 251-764	**HATCH 1 BWR 4 218-560**	**ZIMMER BWR 5 28-560**	**GESSAR BWR 6 238-732**
Reactor Control System:				
Method of variation of reactor power	Movable control rods and variable forced coolant flow	Movable control rods and variable forced coolant flow	Movable control rods and variable forced coolant flow	Movable control rods and variable forced coolant flow
Number of movable control rods	185	137	137	177
Shape of movable control rods	Cruciform	Cruciform	Cruciform	Cruciform
Pitch of movable control rods	12.0	12.0	12.0	12.0
Control material in movable rods	B_4C granules compacted in SS tubes	B_4C granules compacted in SS tubes	B_4C granules compacted in SS tubes	B_4C granules compacted in SS tubes
Type of control rod drives	Bottom entry locking piston	Bottom entry locking piston	Bottom entry locking piston	Bottom entry locking piston
Type of temporary reactivity control for initial core	Burnable poison; gadolinia-urania fuel rods	Burnable poison; gadolinia-urania fuel rods	Burnable poison; gadolinia-urania fuel rods	Burnable poison; gadolinia-urania fuel rods
Incore Neutron Instrumentation:				
Number of incore neutron detectors (fixed)	172	124	124	164
Number of incore detector assemblies	43	31	31	41
Number of detectors per assembly	4	4	4	4
Number of flux mapping neutron detectors	5	4	4	
Range (and number) of detectors:				
Source range monitor	Source to 0.001% power (4)	Source to 0.001% power (4)	Source to 0.001% power (4)	Source to 0.001% power
Intermediate range monitor	0.001% to 10% power (8)	0.001% to 10% power (8)	0.001% to 10% power (8)	0.001% to 10% power
Local power range monitor	5% to 125% power (172)	5% to 125% power (124)	5% to 125% power (124)	5% to 125% power
Average power range monitor *Channels of monitors from LPRM detectors.	5% to 125% power (6)*	2.5% to 125% power (6)*	2.5% to 125% power (6)*	2.5% to 125% power
Number and types of incore neutron sources	7 Sb-Be	5 Sb-Be	5 Sb-Be	
REACTOR VESSEL DESIGN				
Material	Carbon steel/Stainless Clad	Carbon steel/Stainless Clad	Carbon steel/Stainless Clad	Carbon steel/Stainless Clad
Design pressure, psig	1250	1265	1250	1250
Design temperature, °F	575	575	575	575
Inside diameter, ft-in.	20-11	18-2	18-2	19-10
Inside height, ft-in.	72-11	69-4	69-4	70-10
Minimum base metal thickness(cylindrical section) in	6.19	5.53	5.375	5.70
Minimum cladding thicknesses, in	1/8	1/8	1/8	1/8
REACTOR COOLANT RECIRCULATION DESIGN				
Number of recirculation loops	2	2	2	2
Design pressure:				

Table 1.3-1

COMPARISON OF NUCLEAR STEAM SUPPLY SYSTEM DESIGN CHARACTERISTICS

(Parameters are for rated power output for a single plant unless otherwise noted. These parameters were current at issuance of the SSES Operating License and are being maintained for historical reference.)

	SSES BWR 4 251-764	**HATCH 1 BWR 4 218-560**	**ZIMMER BWR 5 28-560**	**GESSAR BWR 6 238-732**
Inlet leg, psig	1250	1148	1250	1250
Outlet leg, psig * Pump and discharge piping to and including discharge block valves. ** Discharge piping from discharge block valve to vessel	1500	1274	1675*;1575**	1675*;1575**
Design temperature, °F	575	562	575	575
Pipe diameter, in	28	28	20	22/24
Pipe material, ANSI	304/316	304/316	304/316	304
Recirculation pump flow rate, gpm	45,200	42,200	33,880	35,400
Number of jet pumps in reactor	20	20	20	20
MAIN STEAMLINES				
Number of streamlines	4	4	4	4
Design pressure, psig	1250	1146	1250	1250
Design temperature, °F	575	563	575	575
Pipe diameter, in	26	24	24	26
Pipe material	Carbon Steel	Carbon Steel	Carbon Steel	Carbon Steel

Table 1.3-2

COMPARISON OF POWER CONVERSION SYSTEM DESIGN CHARACTERISTICS

(Parameters are for rated power output for a single plant unless otherwise noted. These parameters were current at issuance of the SSES Operating License and are being maintained for historical reference.)

	SSES BWR 4 251-764	HATCH BWR 4 218-560	ZIMMER BWR 5 218-560	GESSAR BWR 6 238-732
TURBINE GENERATOR (See Sections 10.2 and 10.4)				
Rated power, MWt	3293	2550	2550	*
Rated power, MWe (gross)	1085	813	883	*
Generator Speed, RPM	1800	1800	1800	*
Rated steam flow, lb/hr	13.4×10^6	10.48×10^6	11.0×10^6	*
Inlet pressure, psig	965	950	950	*
STEAM BYPASS SYSTEM (See Section 10.4.4)				
Capacity, % design steam flow	25	25	25	*
MAIN CONDENSER (See Section 10.4.1)				
Heat removal capacity, Btu/hr	7890×10^6	5720×10^6	7053×10^6	*
CIRCULATING WATER SYSTEM (See section 10.4.5)				
Number of pumps	4	2	3	*
Flow rate, gpm/pump	112,000	185,000	150,000	*
CONDENSATE AND FEEDWATER SYSTEM				
Design flow rate, lb/hr	13.44×10^6	10.096×10^6	10.971×10^6	*
Number of condensate pumps	4	3	3	*
Number of condensate booster pumps	None	3	3	*
Number of feedwater pumps	3	2	2	*
Number of feedwater booster pumps	None	None	None	*
Condensate pump drive	AC Power	AC Power	AC Power	*
Booster pump drive	NA	AC Power	AC Power	*
Feedwater pump drive	Turbine	Turbine	Turbine	*
Feedwater booster pump drive	NA	NA	NA	*
*See applicant's SAR				

Table 1.3-3
COMPARISON OF ENGINEERED SAFETY FEATURES DESIGN CHARACTERISTICS

Security-Related Information
Table Withheld Under 10 CFR 2.390

Table 1.3-4
COMPARISON OF CONTAINMENT DESIGN CHARACTERISTICS

Security-Related Information
Table Withheld Under 10 CFR 2.390

Table 1.3-5

RADIOACTIVE WASTE MANAGEMENT SYSTEMS DESIGN CHARACTERISTICS

Security-Related Information
Table Withheld Under 10 CFR 2.390

Table 1.3-6

COMPARISON OF STRUCTURAL DESIGN CHARACTERISTICS

(Parameters are for rated power output for a single plant unless otherwise noted. These parameters were current at issuance of the SSES Operating License and are being maintained for historical reference.)

	SSES BWR-4 251-764	HATCH 1 BWR 4 218-560	ZIMMER BWR 5 218-560	GESSAR BWR 6 238-732
SEISMIC DESIGN* (See Section 3.7)				
Operating Basis Earthquake				
- horizontal g	0.05	0.08	0.10	0.15
- vertical g	0.033	0.05	0.07	----
Safe shutdown earthquake				
- horizontal g	0.10	0.15	0.20	0.30
- vertical g	0.067	0.10	0.14	----
WIND DESIGN (See Section 3.3)				
Maximum sustained – mph	80	105	90	130
TORNADOS (See Section 3.3)				
Translational – mph	60	60	60	70
Tangential – mph	300	300	300	290

*Some of the tabluated values differ for the design of the Diesel Generator ‘E” Facility.

Table 1.3-7
COMPARISON OF ELECTRICAL POWER SYSTEM DESIGN CHARACTERISTICS

Security-Related Information
Table Withheld Under 10 CFR 2.390

TABLE 1.3-8

SIGNIFICANT DESIGN CHANGES FROM PSAR TO FSAR*

ITEM	CHANGE	REASON FOR CHANGE	FSAR PORTION IN WHICH CHANGE IS DISCUSSED
Recirculation flow measurement	The recirculation flow measurement design was changed from a flow element to an elbow-tap type.	To improve flow measurement accuracy.	7.3.1, 7.6.1
Recirculation system	The pressure interlock for RHR shutdown mode was changed.	NRC Requirement for diversity.	7.3.1, 7.6.1
Nuclear fuel	The number of fuel pins in each fuel bundle has been changed from 7 x 7 to 8 x 8.	Improved fuel performance by increasing safety margins.	4.2
Nuclear boiler	An additional test mode was added for closing MSIV's one at a time to 90% of full open in the fast mode (close in slow mode already existed).	Verifies that the spring force on the valves will cause them to close under loss-of-air conditions.	5.4
Main steam line isolation	A main condenser low vacuum initiation of the main steam line isolation was added.	NRC requirement	7.3.1
Main steam line isolation	Reactor isolation was deleted for high water level initiation actuation.	To provide improved plant availability.	5.4
Main steam line drain system	A main steam line drain system was improved.	Prevent accumulation of condensate in an idle line outboard of MSLIV.	5.4
Feedwater sparger	The thermal sleeve was changed to provide improved design of sparger to nozzle.	To eliminate vibration, failure, and leakage.	5.3
Standby liquid control (SLC) system	Interlocks on the SLC system were revised.	To prevent inadvertent boron injection during system testing.	9.3.5 and 7.4.1

TABLE 1.3-8

SIGNIFICANT DESIGN CHANGES FROM PSAR TO FSAR*

ITEM	CHANGE	REASON FOR CHANGE	FSAR PORTION IN WHICH CHANGE IS DISCUSSED
RCIC & HPCI steam supply	A warmup bypass line and valve was added.	Permits pressurizing and pre-warming of the steam supply line downstream to the turbine during reactor vessel heatup.	5.4 and 6.3
RCIC & HPCI vacuum breaker system	A vacuum breaker system was added to the turbine exhaust line into the suppression pool.	To prevent backup of water in the pipe and consequential high dynamic pipe loads and reactions.	5.4 and 6.3
RCIC & HPCI system	Each component has been made capable of functional testing.	Improved testability	5.4 and 6.3
Automatic depressurization system (ADS)	The interlocks on the automatic depressurization system were revised.	To meet IEEE-279 requirements.	7.3.1
RPV code	The RPV was partially updated to ASME 1971 code and Summer 1971 addenda.	Update to applicable code as much as practical.	5.2
Level instrumentation	The RPV level instrumentation was revised to eliminate Yarway columns and replace them with a conventional condensing chamber type; also, separation and redundancy features were added.	Improve ECCS separation per IEEE 279 and improve reliability.	7.3.1
Leak detection system	The leak detection system was revised to upgrade the capability.	To meet IEEE-279 requirements.	7.6.1
Reactor vibration monitoring	A confirmatory vibration monitoring test was added.	NRC requirement	14.2

TABLE 1.3-8

SIGNIFICANT DESIGN CHANGES FROM PSAR TO FSAR*

ITEM	CHANGE	REASON FOR CHANGE	FSAR PORTION IN WHICH CHANGE IS DISCUSSED
Primary Containment Concrete	Delineation of compressive strengths for pozzolan vs. non-pozzlan Type II Portland cements.	Update to reflect current engineering design requirements.	3.8B
RPV Insulation	Correct the RPV Insulation Description	Revised support beams on as-build RPV Insulation Panels	5.3.3.1.4
Safety Related Conduits & Trays	Correct separation statements for conduits and trays.	Question 7.4 of Amend. #5 of PSAR (Revised per requirement of Reg. Guide 1.75 – 1974).	3.12
Tornado Loading	Revised Tornado Loading combinations.	To reflect latest NRC recommendations in the Standard Review Plan.	3.3

*NOTE: Design changes listed are only those which have occurred between the last SSES PSAR Amendment and Revision 0 of the FSAR. The NRC has been notified of all other design changes prior to the last PSAR amendment by previous amendments to the PSAR.

1.4 IDENTIFICATION OF AGENTS AND CONTRACTORS

1.4.1 Pennsylvania Power & Light Company (APPLICANT)

The Applicant has engaged the contractors noted below to perform engineering, procurement and construction services for the plant. However, irrespective of the contractual responsibilities discussed below, Pennsylvania Power & Light Co. is responsible for the design, construction and operation of the plant. A summary of previous experience in the field of power generation shows that the Applicant is technically qualified to engage in the proposed activities.

Pennsylvania Power & Light Co. has been involved in various nuclear projects for over 17 years. They include the following:

a. A scoping design study of a pressurized water reactor plant (1954-1955)

b. A scoping study of a homogeneous reactor power plant (1955)

c. Participation in the Pennsylvania Advanced Reactor (PAR) project, including research and development of a 135 MWt homogeneous slurry reactor. This was a $9 million project, shared equally by Pennsylvania Power & Light Co. and Westinghouse. Twenty-four Pennsylvania Power & Light Co. engineers and operators participated (1955-1959)

d. Participation in the construction and pre-operational testing of the Homogeneous Reactor Experiment #2 at Oak Ridge (1955-1957)

e. Participation with High Temperature Reactor Development Associates in construction and pre-operational testing of the 40 MWt Peach Bottom Gas Cooled Reactor (1963-1966)

f. Participation in the HTGR Fuel and Fuel Cycle Development Program with other utilities and Gulf General Atomics (1964-1967).

In addition to the above activities various Pennsylvania Power & Light Co. personnel have attended Oak Ridge School of Reactor Technology and have been taking courses in Health Physics, Radiation Chemistry, Reactor Safety, Reactor Core Analysis, Water Cooled Reactor Technology, and Fuel Management.

In-house capability has included nuclear power plant bid evaluation and fuel management program development.

HISTORICAL INFORMATION

Since 1970, PP&L has maintained Engineering, Project Management, Construction and Quality Assurance groups who are assigned full time to the design development and construction of the Susquehanna Steam Electric Station.

1.4.2 ARCHITECT ENGINEER

The Bechtel Power Corporation, San Francisco Power Division, has been awarded contracts for engineering, procurement and construction. Bechtel will perform engineering work related to the Balance of Plant (BOP) including the integration of NSSS systems and components. This work includes the preparation of mechanical, electrical, and civil/structural designs, plans and specifications.

Bechtel has been engaged in construction and engineering activities since 1898. Since the close of World War II, Bechtel has emphasized on electrical power generation projects. During this period, Bechtel has been responsible for the design and/or construction of over 237 thermal generating units, representing more than 118,000,000 kW of new generating capacity. Of this number, a nuclear capacity of more than 69,000,000 kW has been or is being engineered.

The ratings of thermal generating plants designed by Bechtel range up to 1,470,000 kW per unit and include most types of station designs and arrangements, such as reheat and non-reheat, indoor and outdoor stations, single and multiple units, and wide ranges of steam conditions up to 3500 psig, covered design, construction, startup, site surveys, license applications, feasibility studies, and equipment procurement.

1.4.3 NUCLEAR STEAM SUPPLY SYSTEM

The General Electric Company (GE) was has been awarded the contracts to design, fabricate, and deliver the direct cycle boiling water nuclear steam supply system, to fabricate the first core of nuclear fuel, and to provide technical direction of installation, and startup of this equipment. GE has engaged in the development, design, construction and operation of boiling water reactors since 1955. Table 1.4-1 lists over 90 GE reactors completed, under construction, or on order. Thus, GE has substantial experience, knowledge, and capability to design, manufacture, and furnish technical assistance for the installation and startup of reactors.

1.4.4 TURBINE-GENERATOR VENDOR

General Electric Company designed, fabricated, and delivered the turbine-generator for the plant. GE also provides technical assistance for the installation and startup for this equipment.

HISTORICAL INFORMATION

General Electric Company has a long history in the application of turbine-generators in nuclear power stations, dating back to the inception of nuclear facilities for the production of electrical power. GE also has extensive design, development, and installation experience on similar turbine-generator units used in non-nuclear power plants.

1.4.5 OTHER CONSULTANTS

Dames & Moore (D&M) Consultants have been responsible for the review and utilization of on-site meteorological data to perform short and long-term diffuser analysis which determine relative concentrations to the expected from normal plant operations. D&M have also performed geology and hydrology surveys of the Susquehanna SES site and vicinity for PP&L. D&M has performed similar services for other nuclear facilities.

Radiation Management Corporation (RMC) is a service organization which has performed the Appendix I dose calculations, performed the investigational phase of the radiological monitoring program, and will provide medical consulting services defined in the signed agreement letter contained in the Emergency Plan RMC has performed similar services for other nuclear facilities.

HISTORICAL INFORMATION

TABLE 1.4-1

COMMERCIAL NUCLEAR REACTORS COMPLETED, UNDER CONSTRUCTION, OR IN DESIGN BY GENERAL ELECTRIC

Station	Utility	Rating (MWe)	Year of Order	Year of Startup
Dresden 1	Commonwealth Edison	200	1955	1960
Humboldt Bay	Pacific G&E	69	1958	1963
Kahl	Germany	15	1958	1961
Garigliano	Italy	150	1959	1964
Big Rock Point	Consumers Power	70	1959	1963
JPDR	Japan	11	1960	1963
KRB	Germany	237	1962	1967
Tarapur 1	India	190	1962	1969
Tarapur 2	India	190	1962	1969
GKN	Holland	52	1963	1968
Oyster Creek	JCP&L	640	1963	1969
Nine Mile Point 1	Niagara Mohawk	625	1963	1970
Dresden 2	Commonwealth Edison	809	1965	1970
Pilgrim	Boston Edison	664	1965	1972
Millstone 1	NUSCO	652	1965	1971
Tsuruga	Japan	340	1965	1970
Nuclenor	Spain	440	1965	1971
Fukushima 1	Japan	439	1966	1971
BKW KKM	Switzerland	306	1966	1972
Dresden 3	Commonwealth Edison	809	1966	1971
Monticello	Northern States	545	1966	1971
Quad Cities 1	Commonwealth Edison	800	1966	1972
Browns Ferry 1	TVA	1098	1966	1973
Browns Ferry 2	TVA	1098	1966	1974
Quad Cities 2	Commonwealth Edison	800	1966	1972

HISTORICAL INFORMATION

TABLE 1.4-1

COMMERCIAL NUCLEAR REACTORS COMPLETED, UNDER CONSTRUCTION, OR IN DESIGN BY GENERAL ELECTRIC

Station	Utility	Rating (MWe)	Year of Order	Year of Startup
Vermont Yankee	Vermont Yankee	514	1966	1972
Peach Bottom 2	Philadelphia Electric	1065	1966	1974
Peach Bottom 3	Philadelphia Electric	1065	1966	1974
Fitzpatrick	PASNY	821	1966	1975
Bailly	NIPSCO	660	1967	1977
Shoreham	LILCO	819	1967	1978
Cooper	Nebraska PPD	778	1967	1974
Browns Ferry 3	TVA	1098	1967	1975
Limerick 1	Philadelphia Electric	1098	1967	1981
Hatch 1	Georgia	786	1967	1975
Fukushima 2	Japan	762	1967	1974
Brunswick 1	Carolina P&L	821	1968	1976
Brunswick 2	Carolina P&L	821	1968	1975
Arnold	Iowa ELP	569	1968	1974
Fermi 2	Detroit Edison	1123	1968	1979
Limerick 2	Philadelphia Electric	1065	1969	1982
Hope Creek 1	PSE&G	1067	1969	1981
Hope Creek 2	PSE&G	1067	1969	1983
Zimmer 1	CCDPP	810	1969	1978
Chinshan	Taiwan	610	1969	1977
Caorso 1	Italy	827	1969	1975
Hatch 2	Georgia	795	1970	1978
La Salle 1	Commonwealth Edison	1078	1970	1978

TABLE 1.4-1

COMMERCIAL NUCLEAR REACTORS COMPLETED, UNDER CONSTRUCTION, OR IN DESIGN BY GENERAL ELECTRIC

Station	Utility	Rating (MWe)	Year of Order	Year of Startup
La Salle 2	Commonwealth Edison	1078	1970	1979
Susquehanna 1	Pennsylvania P&L	1052*	1970	1980
Susquehanna 2	Pennsylvania P&L	1052*	1970	1982
Chinshan 2	Taiwan	610	1970	1978
WPPSS 2	WPPSS	1103	1971	1977
Nine Mile Point 2	Niagara Mohawk	1080	1971	1979
Grand Gulf 1	Midsouth	1290	1971	1979
Grand Gulf 2	Midsouth	1290	1971	1981
Kaiseraugst	Switzerland	915	1971	1978
Fukushima 6	Japan	1135	1971	1976
Tokai 2	Japan	1135	1971	1976
Riverbend 1	Gulf States	934	1972	1980
Riverbend 2	Gulf States	934	1972	1981
Perry 1	Cleveland Electric	1205	1972	1979
Perry 2	Cleveland Electric	1205	1972	1980
Barton 1	Alabama	1100	1972	1983
Barton 2	Alabama	1100	1972	1984
Douglas Point 1	PEPCO	1178	1972	1985
Douglas Point 2	PEPCO	1178	1972	1987
Somerset 1	New York State E&G	1220	1972	1982
Somerset 2	New York State E&G	1200	1972	1984
Hartsville 1	TVA	1228	1972	1980
Hartsville 2	TVA	1228	1972	1981

* Uprated to 1100 MWe (NET) in 1994.

TABLE 1.4-1

COMMERCIAL NUCLEAR REACTORS COMPLETED, UNDER CONSTRUCTION, OR IN DESIGN BY GENERAL ELECTRIC

Station	Utility	Rating (MWe)	Year of Order	Year of Startup
Hartsville 3	TVA	1228	1972	1981
Hartsville 4	TVA	1228	1972	1982
Laguna Verde 1	Mexico	660	1972	1977
Leibstadt	Switzerland	940	1972	1978
Kuosheng 1	Taiwan	992	1972	1978
Kuosheng 2	Taiwan	992	1972	1979
Clinton 1	Illinois Power	955	1973	1981
Clinton 2	Illinois Power	955	1973	1984
Montague 1	NUSCO	1220	1973	1982
Allens Creek 1	Houston L&P	1150	1973	1980
Allens Creek 2	Houston L&P	1150	1973	1982
Skagit 1	Puget SD	1290	1973	1981
Skagit 2	Puget SD	1290	1973	1983
Barton 3	Alabama	1220	1973	1985
Barton 4	Alabama	1220	1973	1986
Blackfox 1	Oklahoma	950	1973	1983
Blackfox 2	Oklahoma	950	1973	1985
Zimmer 2	CDPP	1220	1973	1984
Confrentes	Spain	975	1973	1977
Laguna Verde 2	Mexico	660	1973	1978
Enel 6	Italy	982	1974	1980
Enel 8	Italy	982	1974	1980

1.5 REQUIREMENTS FOR FURTHER TECHNICAL INFORMATION

1.5.1 DEVELOPMENT OF BWR TECHNOLOGY

1.5.1.1 Current Development Programs

Vibration testing for reactor internals has been performed on virtually all GE-BWR plants. At the time of issue of NRC Regulatory Guide 1.20, test programs for compliance were instituted. The first BWR 4 plant of this size, Browns Ferry 1, is considered a prototype design and was instrumented and subjected to both cold and hot, two-phase flow testing to demonstrate that flow-induced vibrations similar to those expected during operation will not cause damage. Subsequent plants which have internals similar to those of the prototypes will be tested in compliance to the requirements of Regulatory Guide 1.20 to confirm the adequacy of the design with respect to vibration. In addition, the General Electric Company has entered a long-term program for the purposes of development of a vibration monitoring system for light water reactors. The objective of the program is the development of a system requiring sensors on only the outside surface of the reactor pressure vessel to provide continual monitoring for the impact and vibration of loose parts during reactor operation.

1.5.1.1.1 Core Spray Distribution

Due to slight changes in core dimensions and core spray sparger geometry, the core spray flow distribution header was tested to assure that each fuel assembly in the reactor core would receive adequate cooling water in the event of a LOCA. (Preoperational Test P51.1)

The test demonstrated that each fuel assembly receives adequate cooling water flow for any spray system flow rate between the rated flow and the runout flow condition.

1.5.1.1.2 Core Spray and Core Flooding Heat Transfer Effectiveness

Due to the incorporation of an 8 x 8 fuel rod array with unheated "water rods," tests have been conducted to demonstrate the effectiveness of ECCS in the new geometry.

These tests are regarded as confirmatory only, since the geometry change is very slight and the "water rods" provide an additional heat sink in the inside of the bundle which improves heat transfer effectiveness.

HISTORICAL INFORMATION

There are two distinct programs involving the core spray. Testing of the core spray distribution has been accomplished, and the Licensing Topical Report NEDO-10846, "BWR Core Spray Distribution," April, 1973, has been submitted. The other program concerns the testing of core spray and core flooding heat transfer effectiveness. The results of testing with stainless steel cladding were reported in the Licensing Topical Report NEDO-10801, "Modeling the BWR/6 Loss-of-Coolant Accident: Core Spray and Bottom Flooding Heat Transfer Effectiveness," March, 1973. The results of testing using Zircaloy cladding were reported in the Licensing Topical Report, NEDO-20231, "Emergency Core Cooling Tests of an Internally Pressurized, Zircaloy Clad, 8x8 Simulated BWR Fuel Bundle," December, 1973.

1.5.1.1.3 Verification of Pressure Suppression Design

The Mark II Pressure Suppression Test Program was initiated in the fall of 1975 to investigate suppression pool dynamic phenomena. Phase I blowdown tests were completed late in 1975. These tests utilized a single 24-inch diameter (590 mm ID) downcomer which vented into a 7 ft (2.13 meter) inside diameter tank, representative of a single downcomer/pool cell in a typical Mark II suppression pool. The objective of this phase of testing was to quantify pool dynamics phenomena, particularly the effect of wetwell pressurization on pool swell, and the load associated with the low mass flux steam condensation, or chugging. Primary variables were simulated break size, initial vent submergence and wetwell air space configuration, i.e., vented or closed wetwell.

The Phase II tests were generally similar to the Phase I tests, except a 20-inch diameter (489 mm ID) downcomer was used. The Phase I and II tests thus bound the range of vent to pool area ratios of all Mark II containments. Although the test objectives were similar during Phases I and II, some changes were made in the Phase II test matrix after review of the Phase I data. For example, since the Phase I test had shown that wetwell configuration was the variable which had the most pronounced affect on pool dynamics, the decision was made to concentrate the testing effort on the closed wetwell configuration, which is characteristic of the Mark II containment.

In place of the open wetwell tests, additional blowdowns were included in the Phase II test matrix in order to investigate the effect of saturated liquid vs. saturated steam breaks and the effect of downcomer bracing configuration.

As was the case for the Phase I tests, the primary Phase II variables were simulated break size and initial vent submergence.

The Phase III tests investigated the pool temperature sensitivity of pool swell and of the load associated with the chugging phenomenon. Only a single break size and vent

HISTORICAL INFORMATION

submergence were tested, with pool temperature alone being a variable. A significant number of blowdowns were performed to yield a statistically significant data set.

The results of the analysis and related testing is described in the Licensing Topical Report, NEDO-13468; NEDE-13468P, "Mark II Pressure Suppression Test Program Phase II and III Tests," March, 1977.

1.5.1.1.4 Critical Heat Flux Testing

A program for Critical Heat Flux testing was established and was to be similar to that described in the report APED-5286, "Design Basis for Critical Heat Flux Condition in Boiling Water Reactors," September 1966. Since that time, however, a new analysis has been performed and the GETAB program initiated. The results of that analysis and related testing is described in the approved Licensing Topical Report, NEDO-10958-A, "General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application," January 1977.

1.5.1.1.5 Fuel Assembly Structural Testing

Although tests are being conducted to determine the effects of vibration on fuel assembly spacers and to determine the forces to which the assemblies are subjected during shipment, there is no special program at present concentrating on structural testing, and no topical report is anticipated.

1.5.2 PROGRAMS CONDUCTED DURING OPERATIONS PHASE

The acceptability of changes to plant design or modes of operation is assured by PP&L design and procedural controls established in the PP&L Operational Quality Assurance Program. Refer to FSAR Section 17.2.

1.6 MATERIAL INCORPORATED BY REFERENCE

Within each subsection of the text, applicable supporting technical material is referenced. References are cited in a list of references at the end of a section. Most of the references are cited as a particular technical basis for BWR plant design and analysis. However, a few of the references cited in the FSAR refer to technical work performed by GE or Bechtel which is specifically applicable to the Susquehanna SES. The references in this category generally provide a full development and analysis of some aspect of plant technology. These special references are incorporated by reference into this FSAR, thereby becoming part of the license application.

1.6.1 GENERAL ELECTRIC TOPICAL REPORTS

Table 1.6-1 is a list of all GE topical reports and other GE reports which are incorporated in whole or in part by reference in this FSAR, and have been filed with the NRC.

1.6.2 BECHTEL TOPICAL REPORTS

Table 1.6-2 is a list of Bechtel topical reports which have been incorporated in whole or in part by reference in this FSAR.

1.6.3 OTHER TOPICAL REPORTS

Table 1.6-4 is a list of other reports which have been incorporated in whole or in part by reference in this FSAR and which have been filed with the NRC.

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
APED-4824	Maximum Two-Phase Vessel Blowdown from Pipes (April 1965)	6.2
APED-5286	Design Basis for Critical Heat Flux Condition in BWRs (September 1966)	1.5
APED-5458	Effectiveness of Core Standby Cooling Systems for General Electric Boiling Water Reactors (March 1968)	5.4
APED-5460	Design and Performance of General Electric BWR Jet Pumps (July 1968)	3.9
APED-5555	Impact Testing on Collet Assembly for Control Rod Drive Mechanism 7RDB144A (November 1967)	4.6
APED-5640	Xenon Considerations in Design of Large Boiling Water Reactors (June 1968)	4.1,4.3
APED-5652	Stability and Dynamic Performance of the General Electric Boiling Water Reactor	4.1
APED-5706	In-Core Neutron Monitoring System for General Electric Boiling Water Reactors (November 1968, Revised April 1969)	7.6, 7.7 7.6.2a.5
APED-5736	Guidelines for Determining Safe Test Intervals and Repair Times for Engineered Safeguards (April 1969)	Appendix
APED-5750	Design and Performance of General Electric Boiling Water Reactor Main Steam Line Isolation Valves (March 1969)	5.4
APED-5756	Analytical Methods for Evaluating the Radiological Aspects of the General Electric Boiling Water Reactor (March 1969)	15.4
GEAP-10546	Theory Report for Creep-Plast Computer Program (January 1972)	4.1
NEDE-10313	PDA-Pipe Dynamic Analysis Program for Pipe Rupture Movement (Proprietary Filing)	3.6
NEDE-11146	Design Basis for New Gas System (July 1971) (Company Proprietary)	11.3

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDO-20944-(P) (A)	BWR/4 and BWR/5 Fuel Design (October 1976)	4.2
NEDE-21156	Supplemental Information for Plant Modification to Eliminate Significant In-Core Vibration (January 1976)	4.4
NEDE-21175-3-P	BWR/6 Fuel Assembly Evaluation of Combined Safe Shutdown Earthquake (SSE) and Loss-of-Coolant Accident (LOCA) Loadings (Amendment No. 3) (July 1982)	3.9
NEDE-21354-P	BWR Fuel Channel Mechanical Design and Deflection (September 1976)	3.9
NEDE-22290-A, Supp. 1	Safety Evaluation of the General Electric Hybrid 1 Control Rod Assembly for the BWR 4/5 C Lattice (July 1985)	4.2
NEDE-22290-A, Supp. 3	Safety Evaluation of the General Electric Duralife 230 Control Rod Assembly (May 1988)	4.2
NEDE-23014	HEX 01 User's Manual (July 1976)	15.2
NEDE-31096-A	Anticipated Transients Without Scram Response to the NRC ATWS Rule 10CFR50.62 (December 1985)	7.1, 7.2
NEDO-10173	Current State of Knowledge, High Performance BWR Zircaloy-Clad UO2 Fuel (May 1970)	11.1
NEDO-10299	Core Flow Distribution in a Modern Boiling Water Reactor as Measured in Monticello (January 1971)	4.4
NEDO-10320	The General Electric Pressure Suppression Containment Analytical Model (April 1971) Supplement 1 (May 1971)	6.2
NEDO-10349	Analysis of Anticipated Transients Without Scram (March 1971)	15.8

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDO-10466	Power Generation Control Complex Design Criteria and Safety Evaluation (February 1972)	3.12.3.4.2.1 (f)
NEDO-10505	Experience with BWR Fuel Through September 1971 (May 1972)	11.1
NEDO-10527	Rod Drop Accident Analysis for Large Boiling Water Reactors (March 1972) Supplement 1 (July 1972) Supplement 2 (January 1973)	15.4
NEDO-10585	Behavior of Iodine in Reactor Water During Plant Shutdown and Startup (August 1972)	15.6
NEDO-10602	Testing of Improved Jet Pumps for the BWR/6 Nuclear System (June 1972)	3.9
NEDO-10734	A General Justification for Classification of Effluent Treatment System Equipment as Group D (February 1973)	11.3
NEDO-10739	Methods for Calculating Safe Test Intervals and Allowable Repair Times for Engineered Safeguard Systems (January 1973)	6.3
NEDO-10751	Experimental and Operational Confirmation of Offgas System Design Parameters (January 1973) (Company Proprietary)	11.3
NEDO-10801	Modeling the BWR/6 Loss-of-Coolant Accident: Core Spray and Bottom Flooding Heat Transfer Effectiveness (March 1973)	1.5
NEDO-10802	Analytical Methods of Plant Transient Evaluations for General Electric Boiling Water Reactor (February 1973)	4.4, 5.2, 15.1, 15.2, 15.3, 15.4, 15.5
NEDO-10846	BWR Core Spray Distribution (April 1973)	1.5
NEDO-10899	Chloride Control in BWR Coolants (June 1973)	5.2

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDO-10958	General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation, and Design Application (November 1973)	4.3, 4.4, 15.0
NEDO-10958-A	General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation, and Design Application (January 1977)	1.5, 15.4, 16.1
NEDO-10959	General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation, and Design Application (November 1973)	15.0
NEDO-20231	Emergency Core Cooling Tests of an Internally Pressurized, Zircaloy-Clad, 8 x 8 Simulated BWR Fuel Bundle (December 1973)	1.5
NEDO-20360	General Electric Boiling Water Reactor Generic Reload Application for 8x8 Fuel (May 1975)	15.4
NEDO-20533	The General Electric Mark III Pressure Suppression Containment System Analytical Model (June 1974)	
NEDO-20566	General Electric Company Model for Loss-of-Coolant Accident Analysis in Accordance with 10 CFR 50, Appendix K (January 1976)	3.9
NEDO-20626	Studies of BWR Designs for Mitigation of Anticipated Transients without Scrams (October 1974)	15.8
NEDO-20626-1	Studies of BWR Designs for Mitigation of Anticipated Transients without Scrams (June 1975)	15.8
NEDO-20626-2	Studies of BWR Designs for Mitigation of Anticipated Transients without Scrams (July 1975)	15.8
NEDO-20631	Mechanical Property Surveillance of Reactor Pressure Vessels for General Electric BWR/6 Plants (March 1975)	5.3

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDO-20922	Experience with BWR Fuel Through September 1974 (June 1975)	11.1
NEDE-20944	BWR/4 and BWR/5 Fuel Design (October 1976)	4.3
NEDO-20953	Three-Dimensional Boiling Water Reactor Core Core Simulator (May 1976)	15.4
NEDO-21142	Realistic Accident Analysis for General Electric Boiling Water Reactor - The RELAC Code and User's Guide, to be issued (December 1977)	15.4, 15.6, 15.7, 15.2
NEDO-21143	Conservative Radiological Accident Evaluation - The CϕNAC01 Code (March 1976)	15.4, 15.6, 15.7
NEDO-21159	Airborne Release from BWRs for Environment Impact Evaluations (March 1976)	11.1
NEDO-24548	Technical Description Annulus Pressurization Load Adequacy Evaluation	6A
NEDO-21291	Group Notch Mode of the RSCS for Cooper (June 1976)	15.4
NEDO-26453	Oyster Creek Station, FSAR Amendment 10	1.5
	"Summary Memorandum on Excursion Analysis Uncertainties," Dresden Nuclear Power Station, Unit 3, Plant Design Analysis Report Amendment 3	4.3, 15.0
	Hatch Nuclear Plant, Unit 1, PSAR Amendment 10, Appendix L	15.5
	Millstone Nuclear Power Station, PSAR Amendment 14	6.3
	Pilgrim Nuclear Power Station, PSAR, Amendment 14	6.3
APED-4827	F. J. Moody, “Maximum Two-Phase Vessel Blowdown from Pipes,” Topical Report, General Electric Company, (1965)	6.2

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDC-32071P	Diefenderfer, S. B., and D. C. Pappone, “Susquehanna Steam Electric Station Units 1 and 2 SAFER/GESTR-LOCA Loss-of-Coolant Accident Analysis,” General Electric Nuclear Engineering Department	5.4, 6.3
NEDC-32161P	December 1993, (General Electric Report), Power Uprate Engineering Report for Susquehanna Steam Electric Station Units 1 and 2	5.2, 5.3, 10.2, 11.1, 15.6
NEDC-32281P	SAFER/GESTR-LOCA Analysis Basis Documentation for Susquehanna Steam Electric Station Units 1 and 2, September 1993	6.3
NEDE-24131	“Basis for 8x8 Retrofit Fuel Thermal Analysis Application, General Electric Company, September 1978, Proprietary	4.4
NEDE-10813	PDA-Pipe Dynamic Analysis Program for Pipe Rupture Movement, Proprietary Filing	3.6
NEDE-21544P	R. J. Ernst and M. G. Ward, “Mark II Pressure Suppression Containment Systems: An Analytical Model of the Pool Swell Phenomenon,” General Electric Co., December 1976	6.2
NEDE-23785-1-PA	“The GESTR-LOCA and SAFER Models for the Evaluation of the Loss-of-Coolant, Accident, Volume III, SAFER/GESTR Application Methodology,” Revision 1, October 1984	6.3
NEDE-24057-P	“Assessment of Reactor Internals Vibration in BWR/4 and BWR/5 Plants,” (Class III) and NEDO-24057 (Class I), November 1977	3.9
NEDE-24154-P	F. Odar, “Safety Evaluation for General Electric Topical Report: Qualification of One-Dimensional Core Transient Model for Boiling Water Reactors,” also NEDO-24154, Vols. I, II, III, dated June 1980	5.2, 15.1, 15.2, 15.5
NEDM-23842	R. C. Stirn and J. F. Klapproth, “Continuous Control Rod Withdrawal Transient in the Startup Range,” April 18, 1978	15.4
NEDO-10722A	Core Flow Distribution in a Modern Boiling Water Reactor as Measured in Moniticello, August 1976	4.4
NEDO-21143-1	“Radiological Accident Evaluation – The CONOC03 Computer Code”	15.4, 15.6, 15.7

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDO-21231	C. J. Paone, “Bank Position Withdrawal Sequence,” September 1976	15.4
NEDO-21506	“Stability and Dynamic Performance of the General Electric Boiling Water Reactor,” January 1977	4.4
NEDO-21985	“Functional Capability Criteria for Essential Mark II Piping,” 78 NED174 (Class I), September 1978	3.9
CHASTE05	Letter, A. J. Levine (GE) to D. F. Ross (NRC) dated January 27, 1977, “General Electric (GE) Loss-of-Coolant Accident (LOCA) Analysis Model Revisions – Core Heatup Code CHASTE05”	6.3
REFLOOD05	Letter, A. J. Levine (GE) to D. B. Vassallo (NRC) dated March 14, 1977, “Request for Approval for Use of Loss-of-Coolant Accident (LOCA) Evaluations Model Code REFLOOD05”	6.3
NEDO-20566A	“General Electric Company Analytical Model for Loss-of-Coolant Analysis in Accordance with 10CFR50, Appendix K,” September 1986	6.3
NEDE-32417P	“GE 12 Compliance with Amendment 22 of NEDE-24011-P-A (GESTAR 11),” GE Nuclear Energy, December 1994	3.9
NEDE-22290-A	Supplement 1, “Safety Evaluation of the General Electric Hybrid I Control Rod Assembly for the BWR 4/5 C Lattice,” General Electric Company, July 1985	4.2
NEDE-22290-A	Supplement 3, Safety Evaluation of the General Electric Duralife 230 Control Rod Assembly,” General Electric Company, May 1988	4.2
NEDE-31758P-A	“GE Marathon Control Rod Assembly” GE Nuclear Energy, October 1991	4.1, 4.2
NEDO-31960-A	"BWR Owners' Group Long-Term Stability Solutions Licensing Methodology"	3.1, 7.1
NEDO-31960-A, Supplement 1	"BWR Owners' Group Long-Term Stability Solutions Licensing Methodology (Supplement 1)"	3.1, 7.1
NEDO-32465-A	Reactor Stability Detect and Suppress Solution Licensing Basis Methodology for Reload Applications"	3.1, 4.1, 7.1

TABLE 1.6-1

GENERAL ELECTRIC TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
NEDC-32410P-A	"Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC-PRNM) Retrofit Plus Option III Stability Trip Function", October 1995.	3.1, 7.6
NECD-32410P-A Supplement 1	"Nuclear (Measurement Analysis and Control Power Range Neutron Monitor (NUMAC-PRNM) Retrofit Plus Option III Stability Trip Function, Supplement 1", November 1997.	3.1, 7.6

TABLE 1.6-2

BECHTEL TOPICAL REPORTS

(1)	BC-TOP-1, Rev. 1 (12-72), Containment Building Liner Plate Design	3.8
(2)	BC-TOP-4-A, Rev. 3 (11-74) Seismic Analysis of Structures and Equipment for Nuclear Power Plants	3.7B
(3)	BC-TOP-9-A, Rev, 2 (9-74) Design of Structures for Missile Impact	3.6
(4)	BN-TOP-1, Rev. 1 (11-72) Testing Criteria for Integrated Leak Rate Testing of Primary Containment Structures for Nuclear Power Plants	3.9
(5)	BN-TOP-2, Rev. 2 (5-74) Design for Pipe Break Effects	3.6
(6)	BP-TOP-1, Rev. 2 (1-75) Seismic Analysis Piping Systems (Except as noted on Table 3.9-15)	3.7B 3.9
(7)	BN-TOP-4, Rev. 1 (10-77) Subcompartment Pressure and Temperature Transient Analysis. (This report was approved by the NRC in February, 1979.	6B

TABLE 1.6-4

OTHER TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
AE-RTL-788	Void Measurements in the Region of Subcooled and Low Quality Boiling (April 1966)	4.4
ANL-5621	Boiling Density in Vertical Rectangular Multichannel Sections with Natural Circulation (November 1956)	4.4
ANL-6385	Power-to-Void Transfer Functions (July 1961)	4.4
BHR/DER 70-1	Radiological Surveillance Studies at a Boiling Water Nuclear Power Reactor (March 1970)	11.1
BMI-1163	Vapor Formation and Behavior in Boiling Heat Transfer (February 1957)	4.4
CF 59-6-47 (ORNL)	Removal of Fission Product Gases From Reactor Off Gas Streams by Adsorption (June 11, 1959)	11.3
ST1-372-38	Kinetic Studies of Heterogeneous Water Reactors (April 1966)	4.4
TID-4500	Relap 3 - A Computer Program for Reactor Blowdown Analysis IN-1321 (June 3970)	3.6
UCRL-50451	Improving Availability and Readiness of Field Equipment Through Periodic Inspection, p. 10 (July 16, 1968)	18.3
WAPD-BT-19	A Method of Predicting Steady-Boiling Vapor Fractions in Reactor Coolant Channels (June 1960)	4.4
ANF-524(P)(A)	Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors, Revision 2, Supplement 1 Revision 2 and Supplement 2, Advanced Nuclear Fuels Corporation, Richland WA 99352, November 1990	4.1, 4.4, 15.3
ANF-913(P)(A)	Volume 1 Revision 1 and Volume 1 Supplements 2, 3 and 4, "COTRANSA2: A Computer Program for Boiling Water Reactor Transient Analyses," August 1990	5.2, 15.0, 15.1, 15.2, 15.3, 15.5
NE-092-001A	"SSES Power Uprate Licensing Topical Report," and NRC letter dated November 30, 1993, from Thomas E. Murley to Robert G. Byram (PP&L). Subject: Licensing Topical Report for Power Uprate with Increased Core Flow, Rev. 0, Susquehanna Steam Electric Station, Units 1 and 2 (PLA-3788) (TAC NOS. M83426 and M83427) with	10.2, 15.6

TABLE 1.6-4

OTHER TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
	enclosed Safety Evaluation Report	
PL-NF-89-005-A	"Qualification of Transient Analysis Methods for BWR Design and Analysis," Issue Date: July 1992.	15.1
XN-NF-80-19(P)(A)	Volume 1, Supplement 3, "Advanced Nuclear Fuels Methodology for Boiling Water Reactors-Benchmark Results for the CASMO-3G/MICROBURN-B Calculation Methodology," EXXON Nuclear Company, Richland, WA 99352, November 1990	15.1
XN-NF-80-19(P)(A)	"Exxon Nuclear Methodology for Boiling Water Reactors; Neutronic Methods for Design and Analysis," Volume 1, and Volume 1 Supplements 1 and 2, March 1983.	15.0, 15.4
XN-NF-84-105(P)(A)	Volume 1 and Volume 1 Supplements 1 and 2, "XCOBRA-T: A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis," February 1987	15.0, 15.3
XN-NF-84-105(P)(A)	Volume 1 Supplement 4, "XCOBRA-T: A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis, Void Fraction Model Comparison to Experimental Data," June 1988	15.3
ANF-91-048(P)(A)	"Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model," and Correspondence, January 1993.	6.3
XN-NF-80-19(P)(A)	Volume 3, Revision 2, "Exxon Nuclear Methodology for Boiling Water Reactors, THERMEX: Thermal Limits Methodology Summary Description," Siemens Power Corporation, January 1987	4.1, 15.0
XN-NF-79-59(P)(A)	"Methodology for Calculation of Pressure Drop in BWR Fuel Assemblies," November 1979	4.1
EMF-CC-074(P)(A)	Volume 1, 2 and 4 "STAIF – A Computer Program for BWR Stability Analysis in the Frequency Domain"	4.1, 4.4
ANF-89-98(P)(A)	Rev. 1 and Rev. 1 Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Designs," Advanced Nuclear Fuels Corporation, May 1995	4.2
NFQM	"Nuclear Fuel Business Group Quality Management Manual", NFQM, Rev. 1 Framatome – ANP, U.S. Version, July 2003.	4.2
CENPD-400-P-A	"Generic Topical Report for the ABB Option III Oscillation Power Range Monitor (OPRM)"	3.1, 4.4, 7.6

TABLE 1.6-4

OTHER TOPICAL REPORTS

REPORT NUMBER	TITLE	REFERENCED IN FSAR SECTION
EMF-93-177 (P)(A) & SUPPLEMENT 1	"Mechanical Design for BWR Fuel Channels" Siemens Power Corporation, August 2005	4.2
EMF-2209 (P)(A)	"SPCB Critical Power Correlation," September 2003	4.1, 4.4
EMF-2158(P)(A)	"Siemens Power Corporation Methodology For Boiling Water Reactors – Evaluation and Validation of CASMO-4/Microburn-B2" Rev. 0, October 1999	4.1, 4.3, 4.4, 15.4, 15.5
XN-NF-80-19(P)(A)	"Volume 4 Revision 1, Exxon Nuclear Methodology for Boiling Water Reactors: Application of the ENC Methodology to BWR Reloads", Exxon Nuclear Company, June 1986	5.2, 15.0, 15.1, 15.2, 15.4, 15.5
EMF-2361(P)(A)	EXEM BWR-2000 ECCS Evaluation Model", Framatome ANP, May 2001	6.3
ANF-1358(P)(A)	"The Loss of Feedwater Heating Transient in Boiling Water Reactors", Advanced Nuclear Fuels Corporation, September 2005	15.1
XN-NF-85-74(P)(A)	"RODEX2A(BWR) Fuel Thermal-Mechanical Evaluation Model", Exxon-Nuclear Company, Inc,. August 1986	4.1
MEF-93-177(P)(A) Rev. 1	"Mechanical Design for BWR Fuel Channels," August 2005	

START HISTORICAL

1.7 ELECTRICAL, INSTRUMENTATION, AND CONTROL DRAWINGS

Table 1.7-1 contains a list of non-proprietary electrical, instrumentation and control (EI&C) drawings. This table lists those drawings which were considered to be necessary to evaluate the safety-related features in Chapters 7 and 8 of the Susquehanna Unit 1 and 2 FSAR. All the drawings listed in Table 1.7-1 are considered historical.

END HISTORICAL

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-1 SH. 1	E 107150 SH. 1	SINGLE LINE DIAGRAM STATION	23	11/14/95
E-1 SH. 2	E 107150 SH. 2	SINGLE LINE DIAGRAM 13.8KV THRU 480V STATION AUXILIARY BUS ARRANGEMENT	17	11/14/95
E-10 SH. 1	E 107159 SH. 1	SINGLE LINE METER & RELAY DIAGRAM 125V DC 250V DC & 120V AC SYSTEMS	20	04/27/95
E-10 SH. 2	E 107159 SH. 2	SINGLE LINE DIAGRAM ESSENTIAL & EMERGENCY LIGHTING	11	01/27/90
E-102 SH. 38	D 107251 SH. 38	SCHEMATIC DIAGRAM TEST FACILITY TRANSFORMER 13.8KV CIRCUIT BREAKER 52-0A550 CONTROL SCHEME NO 0A0387 GHD 1469 GH/EDG 1414 AS BUILT FOR SYSTEM 003 & 005 ONLY	6	03/13/92
E-102 SH. 39	D 107251 SH. 39	CONNECTION DIAGRAM TEST FACILITY TRANSFORMER 13.8KV CIRCUIT BREAKER 52-0A550 CONTROL GHD 1696 GH/EDG 1563 AS BUILT FOR SYSTEM 003 & 005 ONLY	3	08/22/86
E-103 SH. 1	D 107252 SH. 1	SCHEMATIC DIAGRAM 4.16KV BUS 1A INCOMING FEEDER BREAKER 52-20101 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 101 SCHEME NO 1A0409 SUPERSEDES E109-11 SHEET 51	26	10/19/93
E-103 SH. 2	D 107252 SH. 2	SCHEMATIC DIAGRAM 4.16KV BUS 1A AUXILIARY RELAY CONTROL 1A201 SCHEME NO 1A0410 SUPERSEDES E109-11 SHEET 51	24	11/16/93
E-103 SH. 3	D 107252 SH. 3	SCHEMATIC DIAGRAM 4.16KV BUS 1C INCOMING FEEDER BREAKER 52-20109 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 201 SCHEME NO 1A0411 SUPERSEDES E109-11 SHEET 57	21	10/19/93
E-103 SH. 4	D 107252 SH. 4	SCHEMATIC DIAGRAM 4.16KV BUS 1B INCOMING FEEDER BREAKER 52-20201 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 111 SCHEME NO 1A0412 SUPERSEDES E109-12 SHEET 50	22	10/20/93
E-103 SH. 5	D 107252 SH. 5	SCHEMATIC DIAGRAM 4.16KV BUS 1B AUXILIARY RELAY CONTROL 1A202 SCHEME NO 1A0413 SUPERSEDES E109-12 SHEET 50	25	11/16/93
E-103 SH. 6	D 107252 SH. 6	SCHEMATIC DIAGRAM 4.16KV BUS 1D INCOMING FEEDER BREAKER 52-20209 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 211 SCHEME NO 1A0414 SUPERSEDES E109-12 SHEET 56	21	10/20/93
E-103 SH. 7	D 107252 SH. 7	SCHEMATIC DIAGRAM 4.16KV BUS 1E INCOMING FEEDER BREAKER 52-20301 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 111 SCHEME NO 1A0415	20	10/19/93
E-103 SH. 8	D 107252 SH. 8	SCHEMATIC DIAGRAM 4.16KV BUS 1C AUXILIARY RELAY CONTROL 1A203 SCHEME NO 1A0416	29	03/22/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-103 SH. 9	D 107252 SH. 9	SCHEMATIC DIAGRAM 4.16KV BUS 1E INCOMING FEEDER BREAKER 52-20309 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 211 SCHEME NO 1A0417	21	10/19/93
E-103 SH. 10	D 107252 SH. 10	SCHEMATIC DIAGRAM 4.16KV BUS 1F INCOMING FEEDER BREAKER 52-20401 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 101 SCHEME NO 1A0418 SUPERSEDES E109-14 SHEET 47	22	10/25/93
E-103 SH. 11	D 107252 SH. 11	SCHEMATIC DIAGRAM 4.16KV BUS 1D AUXILIARY RELAY CONTROL 1A204 SCHEME NO 1A0419 SUPERSEDES E109-14 SHEET 47	30	01/20/95
E-103 SH. 12	D 107252 SH. 12	SCHEMATIC DIAGRAM 4.16KV BUS 1F INCOMING FEEDER BREAKER 52-20409 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 201 SCHEME NO 1A0420 SUPERSEDES E109-14 SHEET 54	20	10/25/93
E-103 SH. 13	D 107252 SH. 13	SCHEMATIC DIAGRAM 4.16KV BUS 2A INCOMING FEEDER BREAKER 52-20101 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 101 SCHEME NO 2A0409 SUPERSEDES E109-16 SHEET 49	22	06/06/94
E-103 SH. 15	D 107252 SH. 15	SCHEMATIC DIAGRAM 4.16KV BUS 2C INCOMING FEEDER BREAKER 52-20109 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 201 SCHEME NO 2A0411 SUPERSEDES E109-16 SHEET 55	21	06/06/94
E-103 SH. 16	D 107252 SH. 16	SCHEMATIC DIAGRAM 4.16KV BUS 2B INCOMING FEEDER BREAKER 52-20201 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 111 SCHEME NO 2AQ412 SUPERSEDES E109-17 SHEET 46	24	06/06/94
E-103 SH. 18	D 107252 SH. 18	SCHEMATIC DIAGRAM 4.16KV BUS 2B INCOMING FEEDER BREAKER 52-20209 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 211 SCHEME NO 2A0414 SUPERSEDES E109-17 SHEET 48	23	06/06/94
E-103 SH. 19	D 107252 SH. 19	SCHEMATIC DIAGRAM 4.16KV BUS 2C INCOMING FEEDER BREAKER 52-20301 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 111 SCHEME NO 2A0415 SUPERSEDES E109-19 SHEET 46	24	10/12/95
E-103 SH. 21	D 107252 SH. 21	SCHEMATIC DIAGRAM 4.16KV BUS 2C INCOMING FEEDER BREAKER 52-20308 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 211 SCHEME NO 2A0417 SUPERSEDES E109-19 SHEET 50	23	10/12/95
E-103 SH. 22	D 107252 SH. 22	SCHEMATIC DIAGRAM 4.16KV BUS 2D INCOMING FEEDER BREAKER 52-20401 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 101 SCHEME NO 2A0418 SUPERSEDES E109-18 SHEET 47	21	06/06/94
E-103 SH. 24	D 107252 SH. 24	SCHEMATIC DIAGRAM 4.16KV BUS 2D INCOMING FEEDER BREAKER 52-20408 FROM ENGINEERED SAFEGUARD SYSTEM TRANSFORMER 201 SCHEME NO 2A0420 SUPERSEDES E109-18 SHEET 51	20	06/06/94
E-104 SH. 1	D 107253 SH. 1	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 1X210 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-11 SHEET 54	13	06/24/92
E-104 SH. 2	D 107253 SH. 2	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 1X220 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-12 SHEET 54	13	04/28/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-104 SH. 3	D 107253 SH. 3	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 1X230 4.16KV FEEDER BREAKER CONTROL	13	06/24/92
E-104 SH. 4	D 107253 SH. 4	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 1X240 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-14 SHEET 51	13	04/28/95
E-104 SH. 5	D 107253 SH. 5	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 4.16KV FEEDER BREAKER CONTROL SPARE SUPERSEDES E109-12 SHEET 52	12	06/14/85
E-104 SH. 6	D 107253 SH. 6	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 2X210 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-16 SHEET 53	9	06/24/92
E-104 SH. 7	D 107253 SH. 7	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 2X220 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-17 SHEET 50	11	11/09/95
E-104 SH. 8	D 107253 SH. 8	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 2X230 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-19 SHEET 49	10	06/24/92
E-104 SH. 9	D 107253 SH. 9	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 2X240 4.16KV FEEDER BREAKER CONTROL SUPERSEDES E109-18 SHEET 50	11	11/09/95
E-104 SH. 10	D 107253 SH. 10	SCHEMATIC DIAGRAM 480V LOAD CENTER TRANSFORMER 4.16KV FEEDER BREAKER CONTROL SPARE SUPERSEDES E109-17 SHEET 51 E109-16 SHEET 54 E109-19 SHEET 48 & E109-18 SHEET 49	11	08/08/91
E-105 SH. 1	D 107254 SH. 1	SCHEMATIC DIAGRAM 4.16KV BUS 1A DIESEL GENERATOR CIRCUIT BREAKER 52-20104 CONTROL SCHEME NO 0G2001 SUPERSEDES E109-11 SHEET 53	21	07/07/92
E-105 SH. 3	D 107254 SH. 3	SCHEMATIC DIAGRAM 4.16KV BUS 1B DIESEL GENERATOR CIRCUIT BREAKER 52-20204 CONTROL SCHEME NO 0G2003 SUPERSEDES E109-12 SHEET 53	20	07/20/92
E-105 SH. 5	D 107254 SH. 5	SCHEMATIC DIAGRAM 4.16KV BUS 1C DIESEL GENERATOR CIRCUIT BREAKER 52-20304 CONTROL SCHEME NO 0G2005	21	08/13/92
E-105 SH. 7	D 107254 SH. 7	SCHEMATIC DIAGRAM 4.16KV BUS 1D DIESEL GENERATOR CIRCUIT BREAKER 52-20404 CONTROL SCHEME NO 0G2007 SUPERSEDES E109-14 SHEET 50	23	07/07/92
E-105 SH. 9	D 107254 SH. 9	SCHEMATIC DIAGRAM 4.16KV BUS 2A DIESEL GENERATOR CIRCUIT BREAKER 52-20104 CONTROL SCHEME NO 0G2009 SUPERSEDES E109-16 SHEET 52	20	09/16/92
E-105 SH. 10	D 107254 SH. 10	SCHEMATIC DIAGRAM 4.16KV BUS 2B DIESEL GENERATOR CIRCUIT BREAKER CONTROL SCHEME NO 0G2010 SUPERSEDES E109-17 SHEET 49	22	09/16/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-105 SH. 11	D 107254 SH. 11	SCHEMATIC DIAGRAM 4.16KV BUS 2C DIESEL GENERATOR CIRCUIT BREAKER 52-20304 CONTROL SCHEME NO 0G2011 SUPERSEDES E109-19 SHEET 47	21	09/16/92
E-105 SH. 12	D 107254 SH. 12	SCHEMATIC DIAGRAM 4.16KV BUS 2D DIESEL GENERATOR CIRCUIT BREAKER 52-20404 CONTROL SCHEME NO 0G2012 SUPERSEDES E109-18 SHEET 48	18	07/07/92
E-105 SH. 13	D 107254 SH. 13	SCHEMATIC DIAGRAM 4.16KV BUS 0A510 DIESEL GENERATOR CIRCUIT BREAKER 51001 CONTROL SCHEME NOS 0A0392 0G0415 GHD 1029 GH/EDG 1205 AS BUILT FOR SYSTEM 024A 054	4	12/26/89
E-105 SH. 14	D 107254 SH. 14	SCHEMATIC DIAGRAM 4.16KV BUS 0A510 DIESEL GENERATOR CIRCUIT BREAKER 51002 CONTROL SCHEME NO 0A0393 GHD 1029 GH/EDG 1205 AS BUILT FOR SYSTEM 024A	3	08/27/87
E-105 SH. 15	D 107254 SH. 15	SCHEMATIC DIAGRAM 4.16KV BUS 0A510 DIESEL GENERATOR CIRCUIT BREAKER 51003 CONTROL SCHEME NO 0A0394 GHD 1029 GH/EDG 1205 AS BUILT FOR SYSTEM 024A	3	08/27/87
E-105 SH. 16	D 107254 SH. 16	SCHEMATIC DIAGRAM 4.16KV BUS 0A510 DIESEL GENERATOR CIRCUIT BREAKER 51004 CONTROL SCHEME NO 0A0395 GHD 1029 GH/EDG 1205 AS BUILT FOR SYSTEM 024A	3	08/27/87
E-105 SH. 17	D 107254 SH. 17	SCHEMATIC DIAGRAM 4.16KV 480V TRANSFORMER 0X565 4.16KV FEEDER BREAKER 51005 CONTROL SCHEME NO 0A0396 GHN 1826 GH/EDG 1574 AS BUILT FOR SYSTEM 005 ONLY	4	06/10/93
E-105 SH. 18	D 107254 SH. 18	SCHEMATIC DIAGRAM 4.16KV BUS 0A510 DIESEL GENERATOR CIRCUIT BREAKER 5100 CONTROL SCHEME NO 0A0397 GHN 1826 GH/EDG 1574 AS BUILT FOR SYSTEM 003 054	6	08/27/87
E-105 SH. 19	D 107254 SH. 19	SCHEMATIC DIAGRAM 4.16KV BUS 0A510A DIESEL GENERATOR CIRCUIT BREAKER 510A02 CONTROL SCHEME NO 0A0398 GHD 133	1	10/01/87
E-105 SH. 20	D 107254 SH. 20	SCHEMATIC DIAGRAM 4.16KV BUS 0A510A DIESEL GENERATOR CIRCUIT BREAKER 510A01 CONTROL SCHEME NO 0A0399 GHD 133	1	10/01/87
E-105 SH. 21	D 107254 SH. 21	SCHEMATIC DIAGRAM 4.16KV BUS 0A510B DIESEL GENERATOR CIRCUIT BREAKER 510B02 CONTROL SCHEME NO 0A0400 GHD 133	1	10/01/87
E-105 SH. 22	D 107254 SH. 22	SCHEMATIC DIAGRAM 4.16KV BUS 0A510B DIESEL GENERATOR CIRCUIT BREAKER 510B01 CONTROL SCHEME NO 0A0401 GHD 133	1	10/01/87
E-105 SH. 23	D 107254 SH. 23	SCHEMATIC DIAGRAM 4.16KV BUS 0A510C DIESEL GENERATOR CIRCUIT BREAKER 510C02 CONTROL SCHEME NO 0A0402 GHD 133	1	10/01/87
E-105 SH. 24	D 107254 SH. 24	SCHEMATIC DIAGRAM 4.16KV BUS 0A510C DIESEL GENERATOR CIRCUIT BREAKER 510C01 CONTROL SCHEME NO 0A0403 GHD 133	1	10/01/87

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-105 SH. 25	D 107254 SH. 25	SCHEMATIC DIAGRAM 4.16KV BUS 0A510D DIESEL GENERATOR CIRCUIT BREAKER 510D02 CONTROL SCHEME NO 0A0404 GHD 133	1	10/01/87
E-105 SH. 26	D 107254 SH. 26	SCHEMATIC DIAGRAM 4.16KV BUS 0A510D DIESEL GENERATOR CIRCUIT BREAKER 510D01 CONTROL GHD 133	1	10/01/87
E-109 SH. 1	D 107258 SH. 1	SCHEMATIC DIAGRAM 4.16KV MOTOR FEEDER BREAKER 52-20111 SPARE SUPERSEDES E109-14 SHEET 52 & E109-11 SHEET 58	14	06/28/85
E-11 SH. 1	E 107160 SH. 1	SINGLE LINE METER & RELAY DIAGRAM 125V DC & 250V DC SYSTEM	15	10/26/93
E-11 SH. 2	E 107160 SH. 2	SINGLE LINE METER & RELAY DIAGRAM 125V DC & 250V DC SYSTEM	22	04/18/96
E-11 SH. 3	E 107160 SH. 3	SINGLE LINE METER & RELAY DIAGRAM 250V DC CONTROL CENTERS 1D155 1D165 & 1D254 DIVISION I	14	10/15/93
E-11 SH. 4	E 107160 SH. 4	SINGLE LINE METER & RELAY DIAGRAM 250V DC CONTROL CENTERS 2D155 2D165 & 2D254	20	08/23/95
E-11 SH. 6	E 107160 SH. 6	SINGLE LINE METER & RELAY DIAGRAM 250V DC CONTROL CENTERS 1D264 & 1D274 II	14	07/18/95
E-11 SH. 7	E 107160 SH. 7	SINGLE LINE METER & RELAY DIAGRAM 250V DC CONTROL CENTERS 2D264 2D274 DIVISION II	16	07/11/94
E-11 SH. 11	E 107160 SH. 11	125V DC 1 LINE DIAGRAM DIESEL GENERATOR E K GHN 1809 GH/EDG 1563 AS BUILT FOR SYSTEM 003 005 002 024 024B 054 028A	12	11/20/90
E-12-16 SH. 1	E 107606 SH. 16	RACEWAY LAYOUT CONTROL STRUCTURE AREA 12 PLAN OF ELEVATION 729-0 & 741-1	22	07/20/90
E-12-4 SH. 1	E 107606 SH. 4	TRAY LAYOUT CONTROL STRUCTURE AREA 12 PLAN OF ELEVATION 714-0	24	03/08/89
E-12-5 SH. 1	E 107606 SH. 5	SEISMIC CLASS I TRAY SUPPORTS & EXPOSED CONDUITS CONTROL STRUCTURE AREA 12 PLAN OF ELEVATION 714-0	28	03/08/89
E-12-6 SH. 1	E 107606 SH. 6	RACEWAY LAYOUT CONTROL STRUCTURE AREA 12 PLAN OF ELEVATION 728-1	28	11/17/89

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-12-7 SH. 1	E 107606 SH. 7	RACEWAY LAYOUT CONTROL STRUCTURE AREA 12 PLAN OF ELEVATION 753-0	18	03/29/84
E-12-8 SH. 1	E 107606 SH. 8	RACEWAY LAYOUT CONTROL STRUCTURE CONDUIT & TRAY BELOW RAISED FLOOR AREA 12 PLAN OF ELEVATION 753-0	26	01/21/91
E-13 SH. 1	E 107162 SH. 1	SINGLE LINE METER & RELAY DIAGRAM PLUS OR MINUS 24V DC SYSTEM	10	04/18/91
E-146 SH. 1	D 107295 SH. 1	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP A SCHEME NO 0S0400	18	01/24/91
E-146 SH. 2	D 107295 SH. 2	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP A 0P504A SCHEME NO 0S0400 SUPERSEDES E109-11 SHEET 56	32	03/22/95
E-146 SH. 3	D 107295 SH. 3	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP B SCHEME NO 0S0401	15	01/24/91
E-146 SH. 4	D 107295 SH. 4	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP B 0P504B SCHEME NO 0S0401 SUPERSEDES E109-12 SHEET 55	29	03/22/95
E-146 SH. 5	D 107295 SH. 5	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP C SCHEME NO 0S0402	23	06/24/92
E-146 SH. 6	D 107295 SH. 6	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP C 0P504C SCHEME NO 0S0402	36	09/25/95
E-146 SH. 7	D 107295 SH. 7	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP D SCHEME NO 0S0403	19	06/24/92
E-146 SH. 8	D 107295 SH. 8	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMP D 0P504D SCHEME NO 0S0403 SUPERSEDES E109-14 SHEET 49	30	04/28/95
E-146 SH. 9	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR A LOOP A COOLER SUPPLY VALVE HV01112A DIESEL GENERATOR A ALIGNED FOR DIESEL GENERATOR A SCHEME NO 0S0404	19	12/23/92
E-146 SH. 9A	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR A LOOP A COOLER RETURN VALVE HV01122A DIESEL GENERATOR A ALIGNED FOR DIESEL GENERATOR A SCHEME NO 0S0405	4	12/23/92
E-146 SH. 9B	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR B LOOP A COOLER SUPPLY VALVE HV01112B DIESEL GENERATOR B ALIGNED FOR DIESEL GENERATOR B SCHEME NO 0S0406	4	12/23/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-146 SH. 9C	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR B LOOP A COOLER RETURN VALVE HV01122B DIESEL GENERATOR B ALIGNED FOR DIESEL GENERATOR B SCHEME NO 0S0407	4	12/23/92
E-146 SH. 9D	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR C LOOP A COOLER SUPPLY VALVE HV01112C DIESEL GENERATOR C ALIGNED FOR DIESEL GENERATOR C SCHEME NO 0S0408	4	12/23/92
E-146 SH. 9E	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR C LOOP A COOLER RETURN VALVE HV01122C DIESEL GENERATOR C ALIGNED FOR DIESEL GENERATOR C SCHEME NO 0S0409	4	12/23/92
E-146 SH. 9F	D 107295 SH. 9	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR D LOOP A COOLER SUPPLY VALVE HV01112D DIESEL GENERATOR D ALIGNED FOR DIESEL GENERATOR D SCHEME NO 0S0410	4	12/23/92
E-146 SH. 10	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR A LOOP B SUPPLY VALVE HV01110A SCHEME NO 0S0412 DIESEL GENERATOR A ALIGNED FOR DIESEL GENERATOR A	19	12/23/92
E-146 SH. 10A	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR A LOOP B COOLER RETURN VALVE HV01120A DIESEL GENERATOR A ALIGNED FOR DIESEL GENERATOR A SCHEME NO 0S0413	5	12/23/92
E-146 SH. 10B	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR B LOOP B COOLER SUPPLY VALVE HV01110B DIESEL GENERATOR B ALIGNED FOR DIESEL GENERATOR B SCHEME NO 0S0414	4	12/23/92
E-146 SH. 10C	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR B LOOP B COOLER RETURN VALVE HV01120B DIESEL GENERATOR B ALIGNED FOR DIESEL GENERATOR B SCHEME NO 0S0412 0S0413 0S0414 0S0416	6	12/23/92
E-146 SH. 10D	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR C LOOP B COOLER SUPPLY VALVE HV01110C DIESEL GENERATOR C ALIGNED FOR DIESEL GENERATOR C SCHEME NO 0S0416	5	12/23/92
E-146 SH. 10E	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR C LOOP B COOLER RETURN VALVE HV01120C DIESEL GENERATOR C ALIGNED FOR DIESEL GENERATOR C SCHEME NO 0S0417	4	12/23/92
E-146 SH. 10F	D 107295 SH. 10	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL GENERATOR D LOOP B COOLER SUPPLY VALVE HV01110D DIESEL GENERATOR D ALIGNED FOR DIESEL GENERATOR D SCHEME NO 0S0418	5	12/23/92
E-146 SH. 11	D 107295 SH. 11	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER DIESEL COOLER VALVES AUTOMATIC LOOP TRANSFER SCHEME NOS 0S0420 0S0421 0S0422 0S0427	23	12/06/94
E-146 SH. 12	D 107295 SH. 12	SCHEMATIC DIAGRAM LOOP A & B RUNNING LIGHTS SCHEME NO 0K0114 0S0425 0S0426	20	12/05/94
E-146 SH. 13	D 107295 SH. 13	SPARE CABLES FROM YARD COOLING WATER & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE FOR FUTURE USE	6	03/20/84

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-146 SH. 14	D 107295 SH. 14	SPARE CABLES FROM REACTOR BLDG & DIESEL GENERATOR BLDG FOR FUTURE USE	3	08/31/82
E-146 SH. 15	D 107295 SH. 15	SPARE CABLES FROM REACTOR BLDG & DIESEL GENERATOR BLDG FOR FUTURE USE	1	08/23/83
E-146 SH. 17	D 107295 SH. 17	SCHEMATIC & CONNECTION DIAGRAM EMERGENCY SERVICE WATER DIESEL E COOLER SUPPLY VALVE HV01112E LOOP A SCHEME NO 0S0100 GHD 987 AS BUILT FOR SYSTEM 054	6	09/20/90
E-146 SH. 18	D 107295 SH. 18	SCHEMATIC & CONNECTION DIAGRAM EMERGENCY SERVICE WATER DIESEL E COOLER RETURN VALVE HV01122E LOOP A SCHEME NO 0S0101 GHD 1469 GH/EDG 1414 AS BUILT FOR SYSTEM 054 MCC0D598	7	09/20/90
E-146 SH. 19	D 107295 SH. 19	SCHEMATIC CONNECTION DIAGRAM EMERGENCY SERVICE WATER DIESEL E COOLER SUPPLY VALVE HV01110E LOOP B SCHEME NO 0S0102 GHD 1496 GH/EDG 1414 AS BUILT FOR SYSTEM 054 MCC0D598	8	09/20/90
E-146 SH. 20	D 107295 SH. 20	SCHEMATIC CONNECTION DIAGRAM EMERGENCY SERVICE WATER DIESEL E COOLER RETURN VALVE HV01120E LOOP B SCHEME NO 0S0103 GHN 1809 GH/EDG 1563 AS BUILT FOR SYSTEM 054	8	09/20/90
E-146 SH. 21	D 107295 SH. 21	SCHEMATIC DIAGRAM EMERGENCY SERVICE WATER PUMPS TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 0S0432 GHD 214 AS BUILT FOR SYSTEM 054	1	08/14/87
E-147 SH. 2	D 107296 SH. 2	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER PUMP 1P210B SCHEME 1S0704	11	06/24/96
E-147 SH. 3	D 107296 SH. 3	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION MOTOR OPERATED VALVE HV11314 SCHEME NO 1S0703	14	12/22/92
E-147 SH. 4	D 107296 SH. 4	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION MOTOR OPERATED VALVE HV11313 SCHEME NO 1S0706	17	12/22/92
E-147 SH. 8	D 107296 SH. 8	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER PUMP 2P210B SCHEME 2S0704	8	08/31/83
E-147 SH. 9	D 107296 SH. 9	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION MOTOR OPERATED VALVE HV21314 SCHEME NO 2S0703	12	07/09/96
E-147 SH. 10	D 107296 SH. 10	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION MOTOR OPERATED VALVE HV21313 SCHEME NO 2S0706	16	07/09/96
E-147 SH. 12	D 107296 SH. 12	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER PUMP 2P210A SCHEME 2C0705	10	12/09/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-147 SH. 13	D 107296 SH. 13	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER PUMP 1P210A SCHEME 1S0705	8	12/09/92
E-147 SH. 14	D 107296 SH. 14	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION MOTOR OPERATED VALVES HV11346 SCHEME NO 1S0709	18	07/20/92
E-147 SH. 15	D 107296 SH. 15	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION MOTOR OPERATED VALVES HV11345 SCHEME NO 1S0710	18	12/07/94
E-148 SH. 1	D 107297 SH. 1	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER EMERGENCY SERVICE WATER TRANSFER SOLENOID OPERATED VALVES HV11024A1 HV11024A2 HV11024A3 HV11024B1 HV11024B2 HV11014B3 NO 1S0100	13	02/23/88
E-148 SH. 3	D 107297 SH. 3	SCHEMATIC DIAGRAM TURBINE BLDG CLOSED COOLING WATER HEAT EXCHANGER EMERGENCY SERVICE WATER TRANSFER CONTROL HV11143A HV11143B HV11143C HV10943A2 HV10943B2 SCHEME NO 1S0104	14	03/07/91
E-148 SH. 5	D 107297 SH. 5	SCHEMATIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER EMERGENCY SERVICE WATER TRANSFER SOLENOID OPERATED VALVES HV21024A1 HV21024A2 HV21024A3 HV21024B1 HV21024B2 HV21024B3 NO 250100	9	05/02/91
E-148 SH. 7	D 107297 SH. 7	SCHEMATIC DIAGRAM TURBINE BLDG CLOSED COOLING WATER HEAT EXCHANGER EMERGENCY SERVICE WATER TRANSFER CONTROL HV21143A HV21143B HV20943A2 HV20943B2 HV20943A3 HV20943B3	9	04/16/91
E-149 SH. 1	D 107298 SH. 1	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 1C201 TRANSFER SWITCHES	10	06/12/92
E-149 SH. 2	D 107298 SH. 2	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 1C201 TRANSFER SWITCHES	11	10/26/90
E-149 SH. 3	D 107298 SH. 3	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 1C201 CONTROL SWITCHES	11	07/21/89
E-149 SH. 4	D 107298 SH. 4	SCHEMATIC DIAGRAM PANEL 1C201 TRANSFER LIGHTS SCHEME NOS 1Q0152 1Q0153	5	02/23/95
E-149 SH. 5	D 107298 SH. 5	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 1C201 BYPASS INDICATION	4	07/14/89
E-149 SH. 6	D 107298 SH. 6	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 2C201 TRANSFER SWITCHES	7	11/16/92
E-149 SH. 7	D 107298 SH. 7	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 2C201 TRANSFER SWITCHES	12	07/15/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-149 SH. 8	D 107298 SH. 8	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL CONTROL SWITCHES	9	11/05/86
E-149 SH. 9	D 107298 SH. 9	SCHEMATIC DIAGRAM PANEL 2C201 TRANSFER LIGHTS	6	02/23/95
E-149 SH. 10	D 107298 SH. 10	SCHEMATIC DIAGRAM REMOTE SHUTDOWN PANEL 2C201 BYPASS INDICATION AREA 32 ELEVATION 676-0	4	02/15/90
E-150 SH. 1	D 107299 SH. 1	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP 1B SCHEME 1S0601	13	09/27/83
E-150 SH. 2	D 107299 SH. 2	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP 1B 1P506B SUPERSEDES E109-14 SHEET 53 SCHEME 1S0601	23	02/23/95
E-150 SH. 3	D 107299 SH. 3	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP 1A 1P506A SCHEME NO 1S0600	28	04/28/95
E-150 SH. 4	D 107299 SH. 4	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SPRAY POND BYPASS VALVE HV01222B SCHEME 0S0611	16	02/23/95
E-150 SH. 5	D 107299 SH. 5	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER CROSSTIE VALVE HVE111F073A HVE111F075A HVE111F075B	11	05/21/93
E-150 SH. 6	D 107299 SH. 6	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER TO REACTOR LINE DRAIN VALVE HVE111F074A HVE111F074B	10	11/08/91
E-150 SH. 8	D 107299 SH. 8	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SPRAY POND HEADER VALVES HV-1224B1	20	02/23/95
E-150 SH. 9	D 107299 SH. 9	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER HEAT EXCHANGER OUTLET VALVE HV11215A SCHEME NO 1S0603	12	12/22/92
E-150 SH. 10	D 107299 SH. 10	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER INLET VALVE HV11210A SCHEME 1S0602	7	12/22/92
E-150 SH. 11	D 107299 SH. 11	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER HEAT EXCHANGER INLET VALVE HV11210B SCHEME NO 1S0609	12	05/17/96
E-150 SH. 12	D 107299 SH. 12	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER HEAT EXCHANGER OUTLET VALVE HV11215B SCHEME NO 1S0610	14	02/23/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-150 SH. 13	D 107299 SH. 13	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMPS 1P506A 1P506B SCHEME NOS 1S0600 1S0601	11	10/03/94
E-150 SH. 14	D 107299 SH. 14	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP 2P506A	14	02/02/96
E-150 SH. 15	D 107299 SH. 15	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP 2A 2P506A SUPERSEDES E109-16 SHEET 54 SCHEME 2S0600	16	02/02/96
E-150 SH. 16	D 107299 SH. 16	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP 2B 2P506B SPRCD'S E109-17 SHEET 51 SCHEME NO 2S0601	20	02/02/96
E-150 SH. 18	D 107299 SH. 18	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER CROSSTIE VALVE HVE112F073B HVE112F075A HVE112F075B	7	12/09/92
E-150 SH. 19	D 107299 SH. 19	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER TO REACTOR LINE DRAIN VALVES HVE112F074A HVE112F074B SCHEME NO 2S0616	6	10/17/86
E-150 SH. 22	D 107299 SH. 22	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER HEAT EXCHANGER OUTLET VALVE HV21215A SCHEME NO 2S0603	16	07/09/96
E-150 SH. 23	D 107299 SH. 23	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER HEAT EXCHANGER INLET VALVE HV21210A SCHEME NO 2S0602	10	07/09/96
E-150 SH. 24	D 107299 SH. 24	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER INLET VALVE HV21210B SCHEME NO 2S0609	8	07/09/96
E-150 SH. 25	D 107299 SH. 25	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER HEAT EXCHANGER OUTLET VALVE HV21215B SCHEME 2S0610	12	07/09/96
E-150 SH. 26	D 107299 SH. 26	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER PUMPS 2A & 2B 2P506A 2P506B SCHEME 2S0600 2S0601	4	01/21/85
E-150 SH. 28	D 107299 SH. 28	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SPRAY POND PIPING DRAIN PUMPS 0P595A1 0P595A2 0S0624 0S0625	10	12/09/92
E-150 SH. 29	D 107299 SH. 29	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER CROSSTIE VALVE HVE111F073B SCHEME 1S0613	11	02/23/95
E-150 SH. 30	D 107299 SH. 30	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER CROSSTIE VALVES HVE112F073A SCHEME 2S0612	5	02/23/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-150 SH. 31	D 107299 SH. 31	SCHEMATIC DIAGRAM SPRAY POND VALVES AUXILIARY CONTROL SCHEME NO 0S0627	14	07/16/91
E-150 SH. 32	D 107299 SH. 32	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SPRAY POND BYPASS VALVE HV01222A SCHEME 0S0608	15	02/23/95
E-150 SH. 33	D 107299 SH. 33	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SPRAY POND HEADER VALVES HV01224A1 HV01224A2	15	02/23/95
E-151 SH. 8	D 107300 SH. 8	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP SUCTION VALVE HVB311F023B SCHEME NO 1Q1508	19	03/21/95
E-151 SH. 9	D 107300 SH. 9	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP SUCTION VALVE HVB311F023A SCHEME NO 1Q1507	17	12/22/92
E-151 SH. 10	D 107300 SH. 10	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP DISCHARGE VALVES HVB311F031A HVB311F031B SCHEME NO 1Q1503	30	11/22/93
E-151 SH. 14	D 107300 SH. 14	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP DISCHARGE BYPASS VALVE HVB311F032A HVB311F032B SCHEME NO 1Q1505 1Q1506	19	11/22/93
E-151 SH. 23	D 107300 SH. 23	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP SUCTION VALVE HVB312F023B SCHEME NO 2Q1508	17	02/23/95
E-151 SH. 24	D 107300 SH. 24	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP SUCTION VALVE HVB312F023A SCHEME NO 2Q1507	15	12/23/92
E-151 SH. 25	D 107300 SH. 25	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP DISCHARGE VALVES HVB312F031A HVB312F031B SCHEME NO 2Q1503 2Q1504	19	04/25/94
E-151 SH. 29	D 107300 SH. 29	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP DISCHARGE BYPASS VALVE HVB312F032A HVB312F032B SCHEME NO 2Q1505 2Q1506	17	04/25/94
E-151 SH. 31	D 107300 SH. 31	SCHEMATIC DIAGRAM REACTOR RECIRCULATING RECIRCULATION PUMP TRIP BREAKER 3A SCHEME NO 1Q1540	14	05/08/92
E-151 SH. 32	D 107300 SH. 32	SCHEMATIC DIAGRAM REACTOR RECIRCULATING RECIRCULATION PUMP TRIP BREAKER 4A SCHEME NO 1Q1542	12	10/29/90
E-151 SH. 33	D 107300 SH. 33	SCHEMATIC DIAGRAM REACTOR RECIRCULATING RECIRCULATION PUMP TRIP BREAKER 3B SCHEME NO 1Q1541	10	10/29/90

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-151 SH. 34	D 107300 SH. 34	SCHEMATIC DIAGRAM REACTOR RECIRCULATION REACTOR PRESSURE VESSEL BREAKER 4B SCHEME NO 1Q1543	11	10/29/90
E-151 SH. 35	D 107300 SH. 35	SCHEMATIC DIAGRAM REACTOR RECIRCULATING PUMP TRIP ANTICIPATED TRANSIENT WITHOUT SCRAM SCHEME NO 1Q1545 1Q1546	6	01/12/88
E-151 SH. 36	D 107300 SH. 36	SCHEMATIC DIAGRAM REACTOR RECIRCULATING PUMP TRIP BREAKER 3A SCHEME NO 2Q1540	13	01/26/90
E-151 SH. 37	D 107300 SH. 37	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP TRIP BREAKER 4A SHCEME 1Q1542	16	01/26/90
E-151 SH. 38	D 107300 SH. 38	SCHEMATIC DIAGRAM REACTOR RECIRCULATION PUMP TRIP BREAKER 3B SCHEME NO 2Q1541	12	08/11/92
E-151 SH. 39	D 107300 SH. 39	SCHEMATIC DIAGRAM REACTOR RECIRCULATING RECIRCULATION PUMP TRIP BREAKER 4B SCHEME NO 2Q1543	11	01/26/90
E-152 SH. 1	D 107301 SH. 1	BLOCK DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM CONTROL & INDICATION SCHEME NOS 1Q4017 1Q4018 1Q4019 1Q4020 1Q4021 1Q4022 1Q4023 1Q4024	12	01/18/91
E-152 SH. 2	D 107301 SH. 2	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION CONDENSER VACUUM PUMP 1P216 SCHEME 1Q4001	12	09/27/89
E-152 SH. 3	D 107301 SH. 3	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION VACUUM TANK CONDENSATE PUMP 1P215 SCHEME 1Q400Z	12	09/27/89
E-152 SH. 4	D 107301 SH. 4	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TURBINE AUXILIARY OIL PUMP 1P213 SCHEME NO 1Q4003	11	09/27/89
E-152 SH. 5	D 107301 SH. 5	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION STEAM SUPPLY TO TURBINE VALVE HVE411F001 SCHEME 1Q4004	16	05/08/95
E-152 SH. 6	D 107301 SH. 6	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TEST BYPASS TO CONDENSATE STORAGE TANK VALVE HVE411F008 SCHEME 1Q4005	13	09/27/89
E-152 SH. 7	D 107301 SH. 7	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TEST BYPASS TO CONDENSATE STORAGE TANK VALVE HVE411F011 SCHEME 1Q4006	12	09/27/89
E-152 SH. 8	D 107301 SH. 8	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PUMP DISCHARGE VALVE HVE411F007 SCHEME NO 1Q4007	14	12/31/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-152 SH. 9	D 107301 SH. 9	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PUMP DISCHARGE VALVE HVE411F006 SCHEME 1Q4008	14	12/13/93
E-152 SH. 10	D 107301 SH. 10	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION MINIMUM FLOW BYPASS TO SUPPRESSION POOL VALVE HVE411F012 SCHEME 1Q4009	13	07/17/95
E-152 SH. 11	D 107301 SH. 11	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION LUBE OIL COOLING WATER SUPPRESSION VALVE HVE411F059 SCHEME 1Q4010	10	12/13/93
E-152 SH. 12	D 107301 SH. 12	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PROTECTION PUMP SUCTION FROM CONDENSATE STORAGE TANK VALVE HVE411F004 SCHEME 1Q4011	13	12/31/91
E-152 SH. 13	D 107301 SH. 13	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION OUTBOARD STEAM SUPPLY LINE ISOLATION VALVE HVE411F003 SCHEME NO 1Q4012	17	07/10/95
E-152 SH. 14	D 107301 SH. 14	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PUMP SUCTION FROM SUPPRESSION POOL VALVE HVE411F042 SCHEME NO 1Q4013	15	12/13/93
E-152 SH. 15	D 107301 SH. 15	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TURBINE EXHAUST TO SUPPRESSION POOL VALVE HVE411F066 SCHEME 1Q4014	13	03/13/92
E-152 SH. 16	D 107301 SH. 16	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION INBOARD STEAM SUPPLY LINE ISOLATION VALVE HVE411F002 SCHEME NO 1Q4015	21	07/10/95
E-152 SH. 17	D 107301 SH. 17	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TURBINE EXHAUST VACUUM BREAKER OUTBOARD & INBOARD VALVE HVE411F075 HVE411F079 SCHEME NO 1Q4028 1Q4029	13	09/27/89
E-152 SH. 18	D 107301 SH. 18	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION ALARM INDICATION SCHEME NOS 1Q4030 & 1Q4033	10	05/08/95
E-152 SH. 19	D 107301 SH. 19	BLOCK DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM CONTROL & INDICATION SCHEME NOS 2Q4017 2Q4018 2Q4019 2Q4020 2Q4021 2Q4022 2Q4023 2Q4024	13	05/02/91
E-152 SH. 20	D 107301 SH. 20	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION CONDENSER VACUUM PUMP 2P216 SCHEME NO 2Q4001	11	10/13/88
E-152 SH. 21	D 107301 SH. 21	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION VACUUM TANK CONDENSATE PUMP 2P215 SCHEME NO 2Q4002	11	10/13/88
E-152 SH. 22	D 107301 SH. 22	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TURBINE AUXILIARY OIL PUMP 2P213 SCHEME NO 2Q4003	9	10/13/88

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-152 SH. 23	D 107301 SH. 23	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION STEAM SUPPLY TO TURBINE VALVE HVE412F001 SCHEME NO 2Q4004	12	07/11/94
E-152 SH. 24	D 107301 SH. 24	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TEST BYPASS TO CONDENSATE STORAGE TANK VALVE HVE412F008 SCHEME NO 2Q4005	11	07/09/96
E-152 SH. 25	D 107301 SH. 25	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TEST BYPASS TO CONDENSATE STORAGE TANK VALVE HVE412F011 SCHEME NO 2Q4006	13	07/09/96
E-152 SH. 26	D 107301 SH. 26	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PUMP DISCHARGE VALVE HVE412F007 SCHEME NO 2Q4007	10	07/09/96
E-152 SH. 27	D 107301 SH. 27	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PUMP DISCHARGE VALVE HVE412F006 SCHEME NO 2Q4008	14	07/09/96
E-152 SH. 28	D 107301 SH. 28	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION MINIMUM FLOW BYPASS TO SUPPRESSION POOL VALVE HVE412F012 SCHEME NO 2Q4009	11	07/06/94
E-152 SH. 29	D 107301 SH. 29	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION LUBE OIL COOLING WATER SUPPLY VALVE HVE412F059 SCHEME NO 2Q4010	8	07/09/96
E-152 SH. 30	D 107301 SH. 30	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PROTECTION PUMP SUCTION FROM CONDENSATE STORAGE TANK VALVE HVE412F004 SCHEME NO 2Q4011	11	07/09/96
E-152 SH. 31	D 107301 SH. 31	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION OUTBOARD STEAM SUPPLY LINE ISOLATION VALVE HVE412F003 SCHEME NO 2Q4012	12	09/15/94
E-152 SH. 32	D 107301 SH. 32	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION PUMP SUCTION FROM SUPPRESSION POOL VALVE HVE412F042 SCHEME NO 2Q4013	11	07/09/96
E-152 SH. 33	D 107301 SH. 33	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TURBINE EXHAUST TO SUPPRESSION POOL VALVE HVE412F066 SCHEME NO 2Q4014	11	10/13/88
E-152 SH. 34	D 107301 SH. 34	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION INBOARD STEAM SUPPLY LINE ISOLATION VALVE HVE412F002 SCHEME NO 2Q4015	13	06/02/94
E-152 SH. 35	D 107301 SH. 35	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION TURBINE EXHAUST VACUUM BREAKER OUTBOARD HVE412F075 & INBOARD VALVES HVE412F079 SCHEME NO 2Q4028	11	10/13/88
E-152 SH. 36	D 107301 SH. 36	SCHEMATIC DIAGRAM HIGH PRESSURE COOLANT INJECTION ALARM INDICATION SCHEME NOS 2Q4030 & 2Q4033	9	08/09/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 1	D 107302 SH. 1	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1A SUPERSEDES E109-11 SHEET 52	9	02/10/84
E-153 SH. 2	D 107302 SH. 2	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1A 1P202A SUPERSEDES E109-11 SHEET 52	23	06/22/92
E-153 SH. 3	D 107302 SH. 3	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1B	15	06/05/95
E-153 SH. 4	D 107302 SH. 4	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1B 1P202B SUPERSEDES E109-12 SHEET 51 SCHEME NO 1Q3001	24	03/22/95
E-153 SH. 5	D 107302 SH. 5	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1C	10	02/10/84
E-153 SH. 6	D 107302 SH. 6	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1C 1P202C SCHEME NO 1Q3002	21	06/24/92
E-153 SH. 7	D 107302 SH. 7	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1D	13	02/10/84
E-153 SH. 8	D 107302 SH. 8	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 1D 1P202D SUPERSEDES E109-14 SHEET 48	22	06/24/92
E-153 SH. 9	D 107302 SH. 9	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGE BYPASS VALVE HVE111F048B	12	03/22/95
E-153 SH. 10	D 107302 SH. 10	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP B SUCTION VALVE HVE111F004B	10	10/09/95
E-153 SH. 11	D 107302 SH. 11	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER VALVE HVE111F003B HVE111F047B	10	03/22/95
E-153 SH. 12	D 107302 SH. 12	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SUPPRESSION CHAMBER SPRAY VALVE HVE111F028B SCHEME NO 1Q3011	11	03/22/95
E-153 SH. 13	D 107302 SH. 13	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL TEST LINE CONTROL VALVE HVE111F024B SCHEME NO 1Q3012	9	03/22/95
E-153 SH. 14	D 107302 SH. 14	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION CONTROL VALVE	13	04/17/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 15	D 107302 SH. 15	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL OUTBOARD SHUTDOWN ISOLATION VALVE	17	03/22/95
E-153 SH. 16	D 107302 SH. 16	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION OUTBOARD ISOLATION VALVE HVE111F015B SCHEME NO 1Q3015	16	03/22/95
E-153 SH. 17	D 107302 SH. 17	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SHUTDOWN COOLING INBOARD ISOLATION VALVE HVE111F009	18	03/22/95
E-153 SH. 18	D 107302 SH. 18	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER BYPASS VALVE HVE111F048A	11	07/28/89
E-153 SH. 19	D 107302 SH. 19	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PROTECTION PUMP SUCTION VALVE HVE111F004A HVE111F004C HVE111F004D	8	12/09/92
E-153 SH. 20	D 107302 SH. 20	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SHUTDOWN COOLING SUCTION VALVE HVE111F006A HVE111F006C HVE111F006D	10	11/24/93
E-153 SH. 21	D 107302 SH. 21	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL EXCHANGER SHELL SIDE INLET VALVE HVE111F047A	7	08/10/89
E-153 SH. 23	D 107302 SH. 23	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL TEST RETURN VALVE HVE111F024A SCHEME NO 1Q3030	8	12/22/92
E-153 SH. 24	D 107302 SH. 24	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION CONTROL VALVE HVE111F017A	12	04/26/95
E-153 SH. 25	D 107302 SH. 25	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION INBOARD ISOLATION VALVE HVE111F015A SCHEME NO 1Q3032	14	07/28/89
E-153 SH. 26	D 107302 SH. 26	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP MINIMUM FLOW VALVE HVE111F007A SCHEME NO 1Q3033	10	12/23/92
E-153 SH. 27	D 107302 SH. 27	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER VENT VALVE HVE111F103A HVE111F104A	7	12/22/92
E-153 SH. 28	D 107302 SH. 28	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SUPPRESSION POOL SPRAY VALVE HVE111F027A SCHEME NO 1Q3044	8	05/15/86
E-153 SH. 29	D 107302 SH. 29	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CONTAINMENT SPRAY VALVES HVE111F021A HVE111F021B SCHEME NO 1Q3041	9	12/22/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 30	D 107302 SH. 30	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL TESTABLE CHECK VALVES & EQUALIZER	13	01/28/86
E-153 SH. 32	D 107302 SH. 32	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL MISC VALVES MANUAL INJECTION VALVE HVE111F060A HVE111F060B	10	08/10/89
E-153 SH. 33	D 107302 SH. 33	BLOCK DIAGRAM RESIDUAL HEAT REMOVAL CONTROL & INDICATION	14	07/10/91
E-153 SH. 34	D 107302 SH. 34	BLOCK DIAGRAM RESIDUAL HEAT REMOVAL ALARM & INDICATION SCHEME NOS 1Q3062 1Q3063 1Q3064 1Q3065	14	08/02/89
E-153 SH. 35	D 107302 SH. 35	BLOCK DIAGRAM RESIDUAL HEAT REMOVAL INSTRUMENTATION SCHEME NOS 1Q3066 1Q3067 1Q3070 1Q3071 1I1211 1I1212	7	04/17/90
E-153 SH. 36	D 107302 SH. 36	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SHUTDOWN COOLING SUCTION VALVE HVE111F006B	11	03/22/95
E-153 SH. 37	D 107302 SH. 37	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL REACTOR HEAD SPRAY INBOARD ISOLATION VALVE HVE111F022 SCHEME NO 1Q3073	14	07/10/95
E-153 SH. 38	D 107302 SH. 38	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL REACTOR HEAD SPRAY OUTBOARD ISOLATION VALVE HVE111F023 SCHEME NO 1Q3076	13	02/28/90
E-153 SH. 39	D 107302 SH. 39	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL DISCHARGE TO RADWASTE OUTBOARD ISOLATION VALVE HVE111F049 SCHEME NO 1Q3075	12	03/22/95
E-153 SH. 40	D 107302 SH. 40	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL DISCHARGE TO RADWASTE INBOARD ISOLATION VALVE HVE111F040	11	10/09/95
E-153 SH. 41	D 107302 SH. 41	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CROSS HEADER SHUTOFF VALVE HVE111F010A	12	02/28/90
E-153 SH. 46	D 107302 SH. 46	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2A SCHEME NO 2Q3000	10	11/18/87
E-153 SH. 47	D 107302 SH. 47	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2A 2P202A SUPERSEDES E109-16 SHEET 50 SCHEME NO 2Q3000	16	03/22/95
E-153 SH. 48	D 107302 SH. 48	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2B SCHEME NO 2Q3001 SUPERSEDES E109-17 SHEET 47	12	04/13/88

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 49	D 107302 SH. 49	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2B 2P202B SUPERSEDES E109-17 SHEET 47	12	09/17/92
E-153 SH. 50	D 107302 SH. 50	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2C SCHEME NO 2Q3002 SUPERSEDES E109-19 SHEET 47	10	11/20/87
E-153 SH. 51	D 107302 SH. 51	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2C 2P202C SUPERSEDES E109-19 SHEET 47	12	10/29/92
E-153 SH. 52	D 107302 SH. 52	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2D SCHEME NO 2Q3003 SUPERSEDES E109-18 SHEET 48	13	04/12/88
E-153 SH. 53	D 107302 SH. 53	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP 2D 2P202D SUPERSEDES E109-18 SHEET 48	10	10/29/92
E-153 SH. 54	D 107302 SH. 54	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGE BYPASS VALVE HVE112F048A SCHEME NO 2Q3017	10	07/09/96
E-153 SH. 55	D 107302 SH. 55	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP A SUCTION VALVE HVE112F004A SCHEME NO 2Q3018	11	07/09/96
E-153 SH. 56	D 107302 SH. 56	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER A SHELL SIDE OUTLET VALVE HVE112F003A SCHEME NO 2Q3024	8	03/21/95
E-153 SH. 57	D 107302 SH. 57	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SUPPRESSION CHAMBER SPRAY VALVE HVE112F028A SCHEME NO 2Q3043	9	03/21/95
E-153 SH. 58	D 107302 SH. 58	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL TEST LINE CONTROL VALVE HVE112F024A SCHEME NO 2Q3030	8	07/09/96
E-153 SH. 59	D 107302 SH. 59	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION CONTROL VALVE HVE112F017A SCHEME NO 2Q3031	9	07/09/96
E-153 SH. 60	D 107302 SH. 60	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL OUTBOARD SHUTDOWN ISOLATION VALVE HVE112F008 SCHEME NO 2Q3014	16	07/09/96
E-153 SH. 61	D 107302 SH. 61	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION INBOARD ISOLATION VALVE HVE112F015A SCHEME NO 2Q3032	11	07/09/96
E-153 SH. 62	D 107302 SH. 62	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SHUTDOWN COOLING INBOARD ISOLATION VALVE HVE112F009 SCHEME NO 2Q3016	15	11/07/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 63	D 107302 SH. 63	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL EXCHANGER BYPASS VALVE HVE112F048B SCHEME NO 2Q3004	11	07/09/96
E-153 SH. 64	D 107302 SH. 64	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP SUCTION VALVES HVE112F004B HVE112F004C HVE112F004D SCHEME NO 2Q3009	9	07/09/96
E-153 SH. 65	D 107302 SH. 65	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SHUTDOWN COOLING SUCTION VALVES HVE112F006B HVE112F006C HVE112F006D SCHEME NO 2Q3006	8	05/13/94
E-153 SH. 66	D 107302 SH. 66	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL EXCHANGER SHELL SIDE OUTLET VALVE HVE112F003B SCHEME NO 2Q3008	7	07/21/88
E-153 SH. 67	D 107302 SH. 67	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER DRAIN VALVE HVE112F011B SCHEME NO 2Q3027	9	08/23/90
E-153 SH. 68	D 107302 SH. 68	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL TEST LINE CONTROL VALVE HVE112F024B SCHEME NO 2Q3012	7	07/09/96
E-153 SH. 69	D 107302 SH. 69	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION CONTROL VALVE HVE112F017B SCHEME NO 2Q3013	11	07/09/96
E-153 SH. 70	D 107302 SH. 70	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL INJECTION INBOARD VALVE HVE112F015B SCHEME NO 2Q3015	10	07/09/96
E-153 SH. 71	D 107302 SH. 71	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP MINIMUM FLOW VALVE HVE112F007B SCHEME NO 2Q3034	8	10/28/92
E-153 SH. 72	D 107302 SH. 72	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER VENT VALVES HVE112F103B HVE112F104B SCHEME NO 2Q3036	6	01/14/87
E-153 SH. 73	D 107302 SH. 73	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CONTAINMENT SPRAY VALVES HVE112F016B HVE112F027B SCHEME NO 2Q3040	9	07/09/96
E-153 SH. 74	D 107302 SH. 74	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CONTAINMENT SPRAY VALVES HVE112F021A HVE112F021B SCHEME NO 2Q3041	7	07/09/96
E-153 SH. 75	D 107302 SH. 75	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL TESTABLE CHECK VALVES HVE112F050A HVE112F050B & EQUALIZER HVE112F122A SCHEME NO 2Q3046	11	01/12/87
E-153 SH. 77	D 107302 SH. 77	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL MISC VALVES HVE112F060A PVE112F051A PVE112F051B PVE112F052A PVE112F052B PVE112F053A PVE112F053B SCHEME NOS 2Q3050 2Q3092 2Q3093 2Q3053 2Q3052	12	05/09/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 78	D 107302 SH. 78	BLOCK DIAGRAM RESIDUAL HEAT REMOVAL CONTROL & INDICATION SCHEME NOS 2Q3058 2Q3059 2Q3060 2Q3061	11	06/25/92
E-153 SH. 79	D 107302 SH. 79	BLOCK DIAGRAM RESIDUAL HEAT REMOVAL ALARM & INDICATION SCHEME NOS 2Q3062 2Q063 2Q064 2Q065 DIVISION I & II ALARM & STATUS INDICATION RELAY INPUTS	11	03/10/94
E-153 SH. 80	D 107302 SH. 80	BLOCK DIAGRAM RESIDUAL HEAT REMOVAL INSTRUMENTATION SCHEME NOS 2Q3066 2Q3067 2Q3070 2Q3071 2Q3072	8	07/21/88
E-153 SH. 81	D 107302 SH. 81	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SHUTDOWN COOLING SUCTION VALVE HVE112F006A SCHEME NO 2Q3022	9	03/21/95
E-153 SH. 82	D 107302 SH. 82	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL REACTOR HEAD SPRAY INBOARD ISOLATION VALVE HVE112F022 SCHEME NO 2Q3073	12	03/21/95
E-153 SH. 83	D 107302 SH. 83	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL REACTOR HEAD SPRAY OUTBOARD ISOLATION VALVE HVE112F023 SCHEME NO 2Q3076	15	07/09/96
E-153 SH. 84	D 107302 SH. 84	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL DISCHARGE TO RADWASTE OUTBOARD ISOLATION VALVE HVE112F049 SCHEME NO 2Q3075	10	07/09/96
E-153 SH. 85	D 107302 SH. 85	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL DISCHARGE TO RADWASTE INBOARD ISOLATION VALVE HVE112F040 SCHEME NO 2Q3074	8	07/09/96
E-153 SH. 86	D 107302 SH. 86	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CROSS HEADER SHUTOFF VALVE HVE112F010A	8	07/09/96
E-153 SH. 91	D 107302 SH. 91	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL EXCHANGER SHELL SIDE OUTLET VALVE HVE111F003A SCHEME NO 1Q3024	9	08/02/89
E-153 SH. 93	D 107302 SH. 93	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP MINIMUM FLOW VALVE HVE111F007B SCHEME NO 1Q3034	7	03/21/95
E-153 SH. 94	D 107302 SH. 94	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER VENT VALVE HVE111F103B HVE111F104B	7	03/21/95
E-153 SH. 95	D 107302 SH. 95	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CONTAINMENT SPRAY VALVE HVE111F016A	9	09/27/89
E-153 SH. 96	D 107302 SH. 96	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SUPPRESSION CHAMBER POOL SPRAY VALVE HVE111F028A	11	11/23/93

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-153 SH. 98	D 107302 SH. 98	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL PUMP MINIMUM FLOW VALVE HVE112F007A SCHEME NO 2Q3033	9	03/21/95
E-153 SH. 99	D 107302 SH. 99	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL HEAT EXCHANGER VENT VALVE HVE112F103A HVE112F104A SCHEME NO 2Q3035	8	03/21/95
E-153 SH. 100	D 107302 SH. 100	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CONTAINMENT SPRAY VALVES HVE112F016A HVE112F027A SCHEME NO 2Q3039 2Q3044	8	07/09/96
E-153 SH. 101	D 107302 SH. 101	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL REACTOR HEAD SPRAY VALVE HVE1125112 SCHEME NO 2Q3077	5	07/09/96
E-153 SH. 102	D 107302 SH. 102	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL SUPPRESSION CHAMBER SPRAY VALVE HVE112F028B SCHEME NO 2Q3011	8	05/13/94
E-153 SH. 103	D 107302 SH. 103	SCHEMATIC DIAGRAM RESIDUAL HEAT REMOVAL CROSS HEADER SHUTOFF VALVE HVE112F010B SCHEME NO 2Q3021	8	07/09/96
E-153 SH. 104	D 107302 SH. 104	SCHEMATIC BLOCK DIAGRAM ISOLATION SWING BUS MOTOR GENERATOR SET NO 1 1G202	14	02/25/93
E-153 SH. 105	D 107302 SH. 105	SCHEMATIC BLOCK DIAGRAM ISOLATION SWING BUS MOTOR GENERATOR SET NO 1 & 2	11	05/20/93
E-154 SH. 1	D 107303 SH. 1	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING BAROMETRIC CONDENSER VACUUM PUMP 1P219 SCHEME NO 1Q1300	16	03/21/95
E-154 SH. 2	D 107303 SH. 2	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING BAROMETRIC CONDENSER VACUUM TANK CONDENSATE PUMP 1P220 SCHEME NO 1Q1301	16	03/21/95
E-154 SH. 3	D 107303 SH. 3	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING OUTBOARD STEAM LINE ISOLATION VALVE HVE511F008 SCHEME NO 1Q1302	16	03/21/95
E-154 SH. 4	D 107303 SH. 4	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING INBOARD STEAM LINE ISOLATION VALVE HVE511F007 SCHEME NO 1Q1303	15	03/21/95
E-154 SH. 5	D 107303 SH. 5	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING STEAM TO TURBINE VALVE HVE511F045 SCHEME NO 1Q1304	14	02/21/95
E-154 SH. 6	D 107303 SH. 6	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING PUMP DISCHARGE VALVE HVE511F012	13	03/21/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-154 SH. 7	D 107303 SH. 7	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING INJECTION SHUTOFF VALVE HVE511F013 SCHEME NO 1Q1306	18	03/21/95
E-154 SH. 8	D 107303 SH. 8	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TRIP & THROTTLE VALVE HV15012 SCHEME NO 1Q1307	13	03/21/95
E-154 SH. 9	D 107303 SH. 9	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE COOLING WROUGHT STEEL VALVE HVE511F046	13	01/19/94
E-154 SH. 10	D 107303 SH. 10	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING PROTECTION PUMP SUCTION FROM SUPPRESSION POOL VALVE HVE511F031	14	03/21/95
E-154 SH. 11	D 107303 SH. 11	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING PUMP SUCTION FROM CONDENSATE TANK VALVE HVE511F010 SCHEME NO 1Q1310	12	03/21/95
E-154 SH. 12	D 107303 SH. 12	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING MINIMUM FLOW BYPASS TO SUPPRESSION POOL VALVE HVE511F019 SCHEME NO 1Q1313	15	03/21/95
E-154 SH. 13	D 107303 SH. 13	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING VACUUM PUMP DISCHARGE VALVE HVE511F060 SCHEME NO 1Q1312	15	03/21/95
E-154 SH. 14	D 107303 SH. 14	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE EXHAUST TO SUPPRESSION POOL VALVE HVE511F059 SCHEME NO 1Q1314	16	03/21/95
E-154 SH. 15	D 107303 SH. 15	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TEST BYPASS TO CONDENSATE STORAGE VALVE HVE511F022 SCHEME NO 1Q1311	14	09/27/89
E-154 SH. 16	D 107303 SH. 16	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE EXHAUST VACUUM BREAKER INBOARD VALVE HVE511F084 SCHEME NO 1Q1322	12	03/21/95
E-154 SH. 17	D 107303 SH. 17	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE EXHAUST VACUUM BREAKER OUTBOARD VALVE HVE511F062 SCHEME NO 1Q1323	12	03/21/95
E-154 SH. 18	D 107303 SH. 18	BLOCK DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM CONTROL & INDICATION SCHEME NOS 1Q1315 1Q1316 1Q1317 1Q1318 1Q1319 & 1Q1320	13	06/12/92
E-154 SH. 19	D 107303 SH. 19	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM CONTROL & INDICATION SCHEME NOS 1Q1324 1Q1326	9	05/19/89
E-154 SH. 20	D 107303 SH. 20	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING BAROMETRIC CONDENSER VACUUM PUMP 2P219 SCHEME NO 2Q1300	10	03/21/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-154 SH. 21	D 107303 SH. 21	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING BAROMETRIC CONDENSER VACUUM TANK CONDENSATE PUMP 2P220 SCHEME NO 2Q1301	12	03/21/95
E-154 SH. 22	D 107303 SH. 22	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING OUTBOARD STEAM LINE ISOLATION VALVE HVE512F008 SCHEME NO 2Q1302	10	06/25/96
E-154 SH. 23	D 107303 SH. 23	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING INBOARD STEAM LINE ISOLATION VALVE HVE512F007 SCHEME NO 2Q1303	14	03/17/95
E-154 SH. 24	D 107303 SH. 24	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING STEAM TO TURBINE VALVE HVE512F045 SCHEME NO 2Q1304	12	06/25/96
E-154 SH. 25	D 107303 SH. 25	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING PUMP DISCHARGE VALVE HVE512F012 SCHEME NO 2Q1305	9	03/17/95
E-154 SH. 26	D 107303 SH. 26	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING INJECTION SHUTOFF VALVE HVE512F013 SCHEME NO 2Q1306	14	06/25/96
E-154 SH. 27	D 107303 SH. 27	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TRIP & THROTTLE VALVE HV25012 SCHEME NO 2Q1307	13	06/25/96
E-154 SH. 28	D 107303 SH. 28	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE COOLING WATER SUPPLY VALVE HVE512F046 SCHEME NO 2Q1308	10	06/25/96
E-154 SH. 29	D 107303 SH. 29	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING PUMP SUCTION FROM SUPPRESSION POOL VALVE HVE512F031 SCHEME NO 2Q1309	17	06/25/96
E-154 SH. 30	D 107303 SH. 30	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING PUMP SUCTION FROM CONDENSATE TANK VALVE HVE512F010 SCHEME NO 2Q1310	12	06/25/96
E-154 SH. 31	D 107303 SH. 31	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING MINIMUM FLOW BYPASS TO SUPPRESSION POOL VALVE FVE512F019 SCHEME NO 2Q1313	13	03/17/95
E-154 SH. 32	D 107303 SH. 32	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING VACUUM PUMP DISCHARGE VALVE HVE512F060 SCHEME NO 2Q1312	11	03/17/95
E-154 SH. 33	D 107303 SH. 33	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE EXHAUST TO SUPPRESSION POOL VALVE HVE512F059 SCHEME NO 2Q1314	12	03/17/95
E-154 SH. 34	D 107303 SH. 34	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TEST BYPASS TO CONDENSATE STORAGE VALVE HVE512F022 SCHEME NO 2Q1311	9	06/25/96

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-154 SH. 35	D 107303 SH. 35	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE EXHAUST VACUUM BREAKER INBOARD VALVE HVE512F084 SCHEME NO 2Q1322	9	03/17/95
E-154 SH. 36	D 107303 SH. 36	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING TURBINE EXHAUST VACUUM BREAKER OUTBOARD VALVE HVE512F062 SCHEME NO 2Q1323	9	03/17/95
E-154 SH. 37	D 107303 SH. 37	BLOCK DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM CONTROL & INDICATION	14	08/09/94
E-154 SH. 38	D 107303 SH. 38	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM CONTROL & INDICATION	6	09/25/86
E-154 SH. 39	D 107303 SH. 39	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM CONTROL SCHEME NOS 1Q1328 1Q1329 1Q1330	11	10/17/94
E-154 SH. 40	D 107303 SH. 40	SCHEMATIC DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM CONTROL SCHEME NOS 2Q1328 2Q1329 2Q1330	11	11/16/92
E-155 SH. 1	D 107304 SH. 1	SCHEMATIC DIAGRAM CORE SPRAY INJECTION OUTBOARD SHUTOFF VALVES HVE211F004A HVE211F004B	13	12/23/92
E-155 SH. 2	D 107304 SH. 2	SCHEMATIC DIAGRAM CORE SPRAY PUMP MINIMUM FLOW BYPASS VALVES HVE211F031A HVE211F031B	11	12/09/92
E-155 SH. 3	D 107304 SH. 3	SCHEMATIC DIAGRAM CORE SPRAY INBOARD INJECTION SHUTOFF VALVES HVE211F005A HVE211F005B	13	12/23/92
E-155 SH. 4	D 107304 SH. 4	SCHEMATIC DIAGRAM CORE SPRAY SUPPRESSION POOL SUCTION VALVES HVE211F001A HVE211F001B	11	12/09/92
E-155 SH. 5	D 107304 SH. 5	SCHEMATIC DIAGRAM CORE SPRAY TEST LINE TO SUPPRESSION POOL VALVES HVE211F015A HVE211F015B	15	12/23/92
E-155 SH. 6	D 107304 SH. 6	SCHEMATIC DIAGRAM CORE SPRAY TESTABLE CHECK VALVES HVE211F006A HVE211F006B & MANUAL INJECTION VALVES HVE211F006A HVE211F007A	13	01/29/86
E-155 SH. 7	D 107304 SH. 7	SCHEMATIC DIAGRAM CORE SPRAY TESTABLE CHECK BYPASS SHUTOFF VALVE HVE211F037A HVE211F037B SCHEME NO 1Q0819 1Q0820	9	12/21/88
E-155 SH. 8	D 107304 SH. 8	BLOCK DIAGRAM CORE SPRAY SYSTEM CONTACT & INDICATOR	7	10/04/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-155 SH. 9	D 107304 SH. 9	SCHEMATIC DIAGRAM CORE SPRAY SYSTEM STATUS INDICATION SCHEME NOS 1Q0829 & 1Q0830	13	07/02/93
E-155 SH. 10	D 107304 SH. 10	SCHEMATIC DIAGRAM CORE SPRAY INJECTION OUTBOARD SHUTOFF VALVES HVE212F004A HVE212F004B SCHEME NO 2Q0807 2Q0808	11	06/25/96
E-155 SH. 11	D 107304 SH. 11	SCHEMATIC DIAGRAM CORE SPRAY PUMP MINIMUM FLOW BYPASS VALVES HVE212F013A HVE212F013B SCHEME NO 2Q0813 2Q0814	9	06/25/96
E-155 SH. 12	D 107304 SH. 12	SCHEMATIC DIAGRAM CORE SPRAY INBOARD INJECTION SHUTOFF VALVES HVE212F005A HVE212F005B SCHEME NO 2Q0809 2Q0810	11	06/25/96
E-155 SH. 13	D 107304 SH. 13	SCHEMATIC DIAGRAM CORE SPRAY SUPPRESSION POOL SUCTION VALVES HVE212F001A HVE212F001B SCHEME NO 2Q0805 2Q0806	8	06/25/96
E-155 SH. 14	D 107304 SH. 14	SCHEMATIC DIAGRAM CORE SPRAY TEST LINE TO SUPPRESSION POOL VALVE HVE212F015A HVE212F015B SCHEME NO 2Q0811 2Q0812	11	06/25/96
E-155 SH. 15	D 107304 SH. 15	SCHEMATIC DIAGRAM CORE SPRAY TESTABLE CHECK VALVES HVE212F006A HVE212F006B & MANUAL INJECTION VALVES HVE212F007A HVE212F007B SCHEME NOS 2Q0815 & 2Q0817	10	06/02/88
E-155 SH. 16	D 107304 SH. 16	SCHEMATIC DIAGRAM CORE SPRAY TESTABLE CHECK BYPASS SHUTOFF VALVE HVE212F037A HVE212F037B SCHEME NO 2Q0819 2Q0820	10	11/07/86
E-155 SH. 17	D 107304 SH. 17	BLOCK DIAGRAM CORE SPRAY SYSTEM CONTACT & INDICATOR	7	05/09/86
E-155 SH. 18	D 107304 SH. 18	SCHEMATIC DIAGRAM CORE SPRAY SYSTEM STATUS INDICATION SCHEME NOS 2Q0829 & 2Q0830	9	08/01/90
E-156 SH. 1	D 107305 SH. 1	SCHEMATIC DIAGRAM CORE SPRAY PUMP 1A 1P206A SUPERSEDES E109-11 SHEET 54 SCHEME NO 1Q0801	19	06/24/92
E-156 SH. 2	D 107305 SH. 2	SCHEMATIC DIAGRAM CORE SPRAY PUMP 1B 1P206B SUPERSEDES E109-12 SHEET 54 SCHEME NO 1Q0802	19	06/24/92
E-156 SH. 3	D 107305 SH. 3	SCHEMATIC DIAGRAM CORE SPRAY PUMP 1C 1P206C	24	03/24/95
E-156 SH. 4	D 107305 SH. 4	SCHEMATIC DIAGRAM CORE SPRAY PUMP 1D 1P206D SUPERSEDES E109-14 SHEET 51 SCHEME 1Q0804	23	07/20/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-156 SH. 5	D 107305 SH. 5	SCHEMATIC DIAGRAM CORE SPRAY PUMP 2A 2P206A SCHEME NO 2Q0801 SUPERSEDES E109-16 SHEET 53	19	09/17/92
E-156 SH. 6	D 107305 SH. 6	SCHEMATIC DIAGRAM CORE SPRAY PUMP 2B 2P2063 SCHEME NO 2Q0802 SUPERSEDES E109-17 SHEET 50	15	09/17/92
E-156 SH. 7	D 107305 SH. 7	SCHEMATIC DIAGRAM CORE SPRAY PUMP 2C 2P206C SCHEME NO 2Q0803 SUPERSEDES E109-19 SHEET 49	17	09/17/92
E-156 SH. 8	D 107305 SH. 8	SCHEMATIC DIAGRAM CORE SPRAY PUMP 2D 2P206D SCHEME NO 2Q0804 SUPERSEDES E109-18 SHEET 50	17	09/17/92
E-157 SH. 1	D 107306 SH. 1	BLOCK DIAGRAM REACTOR PROTECTION SYSTEM POWER DISTRIBUTION	17	12/13/93
E-157 SH. 2	D 107306 SH. 2	BLOCK DIAGRAM REACTOR PROTECTION SYSTEM TRIP CIRCUITS & REACTOR PROTECTION SYSTEM VALVES	19	12/05/94
E-157 SH. 3	D 107306 SH. 3	BLOCK DIAGRAM REACTOR PROTECTION SYSTEM TRIP SIGNALS TO HYDRAULIC CONTROL UNITS	7	09/13/83
E-157 SH. 4	D 107306 SH. 4	BLOCK DIAGRAM REACTOR PROTECTION SYSTEM POWER DISTRIBUTION	15	06/07/94
E-157 SH. 5	D 107306 SH. 5	BLOCK DIAGRAM REACTOR PROTECTION SYSTEM TRIP CIRCUITS & REACTOR PROTECTION SYSTEM VALVES	13	06/09/94
E-157 SH. 6	D 107306 SH. 6	BLOCK DIAGRAM REACTOR PROTECTION SYSTEM TRIP SIGNALS TO HYDRAULIC CONTROL UNITS	4	11/05/83
E-159 SH. 6	D 107308 SH. 6	SCHEMATIC DIAGRAM LIQUID RADWASTE COLLECTION DRYWELL FLOOR DRAIN SUMP ISOLATION VALVES HV16108A1 HV16108A2 SCHEME NOS 1R0009 & 1R0023	25	01/11/91
E-159 SH. 8	D 107308 SH. 8	SCHEMATIC DIAGRAM LIQUID RADWASTE COLLECTION DRYWELL EQUIPMENT DRAIN TANK 1T218 ISOLATION VALVE HV16116A1	19	09/22/89
E-159 SH. 9	D 107308 SH. 9	SCHEMATIC DIAGRAM LIQUID RADWASTE COLLECTION DRYWELL EQUIPMENT DRAIN TANK 1T218 ISOLATION VALVE HV16116A2	18	09/22/89
E-159 SH. 14	D 107308 SH. 14	SCHEMATIC DIAGRAM LIQUID RADWASTE COLLECTION DRYWELL FLOOR DRAIN SUMP ISOLATION VALVE HB26108A1	21	08/28/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-159 SH. 16	D 107308 SH. 16	SCHEMATIC DIAGRAM LIQUID RADWASTE COLLECTION DRYWELL EQUIPMENT DRAIN TANK 2T218 ISOLATION VALVE HV26116A1	17	06/25/92
E-159 SH. 17	D 107308 SH. 17	SCHEMATIC DIAGRAM LIQUID RADWASTE COLLECTION DRYWELL EQUIPMENT DRAIN TANK 2T218ISOLATION VALVE HV26116A2	16	06/25/92
E-165 SH. 4	D 107314 SH. 4	SCHEMATIC DIAGRAM REACTOR WATER CLEANUP SYSTEM MOTOR OPERATED VALVES HVG331F034 HVG331F035 HVG331F031 HVG331F104 HVG331F042 HVG331F044	9	06/17/85
E-165 SH. 5	D 107314 SH. 5	BLOCK DIAGRAM REACTOR WATER CLEANUP SYSTEM INSTRUMENT CIRCUIT	8	05/24/93
E-165 SH. 6	D 107314 SH. 6	SCHEMATIC DIAGRAM REACTOR WATER CLEANUP SYSTEM INBOARD ISOLATION VALVE HVG331F001 SCHEME NO 1Q0615	21	12/13/93
E-165 SH. 7	D 107314 SH. 7	SCHEMATIC DIAGRAM REACTOR WATER CLEANUP SYSTEM OUTBOARD ISOLATION VALVE HVG331F004 SCHEME NO 1Q0616	23	12/13/93
E-165 SH. 14	D 107314 SH. 14	BLOCK DIAGRAM REACTOR WATER CLEANUP SYSTEM INSTRUMENT CIRCUIT	7	10/27/92
E-165 SH. 15	D 107314 SH. 15	SCHEMATIC DIAGRAM REACTOR WATER CLEANUP SYSTEM INBOARD ISOLATION VALVE HVG332F001 SCHEME NO 2Q0615	17	07/06/94
E-165 SH. 16	D 107314 SH. 16	SCHEMATIC DIAGRAM REACTOR WATER CLEANUP SYSTEM OUTBOARD ISOLATION VALVE HVG332F004 SCHEME NO 2Q0616	17	06/30/94
E-166 SH. 1	D 107315 SH. 1	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM SCHEME NO 1Q0200 PUMP 1P208A	19	05/06/94
E-166 SH. 2	D 107315 SH. 2	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM LIQUID CONTROL INJECTION PUMP 1P208B SCHEME NO 1Q0201	18	01/07/88
E-166 SH. 3	D 107315 SH. 3	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM HEATERS 1E220 1E219 SCHEME NOS 1Q0202 1Q0203	11	11/08/91
E-166 SH. 4	D 107315 SH. 4	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM INJECTION VALVE HVC411F008 HVC411F006 SHCHEME NOS IQ0206 IQ0207	14	03/13/92
E-166 SH. 5	D 107315 SH. 5	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM INJECTION PUMP 2P208A SCHEME NO 2Q0200	14	05/06/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-166 SH. 6	D 107315 SH. 6	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM INJECTION PUMP 2P208B SCHEME NO 2Q0201	14	07/15/88
E-166 SH. 7	D 107315 SH. 7	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM HEATERS 2E220 2E219 SCHEME NOS 2Q0202 2Q0203	11	12/09/88
E-166 SH. 8	D 107315 SH. 8	SCHEMATIC DIAGRAM STANDBY LIQUID CONTROL SYSTEM INJECTION VALVE HVC412F008 HVC412F006 SCHEME NOS 2Q0204 2Q0206 2Q0207	14	07/09/96
E-168 SH. 1	D 107317 SH. 1	BLOCK DIAGRAM STEAM LEAK DETECTION SYSTEM DIFFERENTIAL TEMPERATURE RECORD SCHEME NO 1Q0708 & SCHEME NO 1Q0711	8	03/17/89
E-168 SH. 2	D 107317 SH. 2	BLOCK DIAGRAM STEAM LEAK DETECTION SYSTEM SCHEME NOS 1Q0701 1Q0702 1Q0703 1Q0704 1Q0705 1Q0706	8	03/17/89
E-168 SH. 3	D 107317 SH. 3	BLOCK DIAGRAM STEAM LEAK DETECTION SYSTEM DIFFERENTIAL TEMPERATURE RECORD & TEMPERATURE RECORD SCHEME NOS 2Q0707 2Q0708 2Q0711	3	08/30/88
E-168 SH. 4	D 107317 SH. 4	BLOCK DIAGRAM STEAM LEAK DETECTION SYSTEM SCHEME NOS 2Q0701 2Q0702 2Q0703 2Q0704 2Q0705 & 2Q0706	4	08/18/88
E-169 SH. 1	D 107318 SH. 1	SCHEMATIC DIAGRAM CONTROL ROD DRIVE PUMP 1A 1P132A SUPERSEDES E109-11 SHEET 55	22	02/09/95
E-169 SH. 2	D 107318 SH. 2	SCHEMATIC DIAGRAM CONTROL ROD DRIVE PUMP 1B 1P132B SUPERSEDES E109-14 SHEET 52	21	12/27/94
E-169 SH. 4	D 107318 SH. 4	SCHEMATIC DIAGRAM CONTROL ROD DRIVE HYDRAULIC SYSTEM PRESSURE THROTTLING VALVES PVC121F003	10	12/23/92
E-169 SH. 6	D 107318 SH. 6	SCHEMATIC DIAGRAM CONTROL ROD DRIVE PUMP 2A 2P132A SUPERSEDES E109-16 SHEET 51	16	03/21/96
E-169 SH. 7	D 107318 SH. 7	SCHEMATIC DIAGRAM CONTROL ROD DRIVE PUMP 2P132B SUPERSEDES E109-18 SHEET 49	16	03/21/96
E-169 SH. 9	D 107318 SH. 9	SCHEMATIC DIAGRAM CONTROL ROD DRIVE HYDRAULIC SYSTEM PRESSURE THROTTLING VALVE PVC122F003	9	12/23/92
E-170 SH. 1	D 107319 SH. 1	BLOCK DIAGRAM NUCLEAR SYSTEM SUPPLY SHUTOFF SYSTEM ISOLATION LOGIC SCHEME NOS 1Q0101 1Q0105 1Q0124 1Q0106 1Q0110 1Q0114 1Q0108 1Q0109 1Q0118 1Q0119 1Q0107 1Q0120 1Q0121	24	01/04/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-170 SH. 2	D 107319 SH. 2	SCHEMATIC DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM LINE DRAIN ISOLATION VALVE HVB211F016 SCHEME NO 1Q0122	13	12/22/92
E-170 SH. 3	D 107319 SH. 3	SCHEMATIC DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM LINE ISOLATION VALVE HVB211F019	18	05/13/92
E-170 SH. 4	D 107319 SH. 4	BLOCK DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM ISOLATION LOGIC SCHEME NOS 2Q0101 2Q0105 2Q0124 2Q0106 2Q0107 2Q0110 2Q0114 2Q0108 2Q0109 2Q0118 2Q0119 2Q0120 2Q0121	23	12/01/94
E-170 SH. 5	D 107319 SH. 5	SCHEMATIC DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM LINE DRAIN ISOLATION VALVE HVB212F016 SCHEME NO 2Q0122	15	12/22/92
E-170 SH. 6	D 107319 SH. 6	SCHEMATIC DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM LINE ISOLATION VALVE HVB212F019 SCHEME NO 2Q0123	15	05/23/91
E-170 SH. 7	D 107319 SH. 7	SCHEMATIC DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM INBOARD ISOLATION VALVE INDICATION SCHEME NO 1Q0125	10	03/17/95
E-170 SH. 8	D 107319 SH. 8	SCHEMATIC DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM MAIN STEAM INBOARD ISOLATION VALVE INDICATION SCHEME NO 2Q0125	12	03/17/95
E-171 SH. 1	D 107320 SH. 1	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL SUPPRESSION POOL VACUUM RELIEF VALVES PSV15704A1 PSV15704B1 PSV15704C1 PSV15704D1 PSV15704E1 SCHEME NO 1Q4151	13	03/26/90
E-171 SH. 2	D 107320 SH. 2	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL SUPPRESSION POOL VACUUM RELIEF VALVES PSV15704A2 PSV15704B2 PSV15704C2 PSV15704D2 PSV15704E2	12	03/26/90
E-171 SH. 3	D 107320 SH. 3	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL PROCESS & PNEUMATIC ISOLATION VALVES HV15714 FV05719 HV15704 HV15721 HV15724 HV15723 HV15725 HV15722 SCHEME NOS 1Q4161 & 0Q4168	19	01/15/92
E-171 SH. 4	D 107320 SH. 4	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL ATMOSPHERIC MONITORING VALVES DIVISION I 1CB220B	23	07/05/95
E-171 SH. 5	D 107320 SH. 5	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CONTAINMENT ISOLATION VALVE HV15766	14	12/23/92
E-171 SH. 6	D 107320 SH. 6	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CONTAINMENT OUTBOARD ISOLATION VALVE HV15768 SCHEME NO 1Q4170	15	09/27/89
E-171 SH. 7	D 107320 SH. 7	SCHEMATIC DIAGRAM SUPPRESSION POOL WATER FILTER PUMP 1P229	11	05/06/86

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-171 SH. 8	D 107320 SH. 8	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL ISOLATION LOGIC & STANDBY GAS TREATMENT SYSTEM ISOLATION VALVES HV15713 HV15703	21	10/09/95
E-171 SH. 9	D 107320 SH. 9	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL NITROGEN MAKEUP VALVES	19	08/22/95
E-171 SH. 10	D 107320 SH. 10	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL SUPPRESSION POOL VACUUM RELIEF VALVES PSV25704A1 PSV25704B1 PSV25704C1 PSV25704D1 PSV25704E1	9	03/30/90
E-171 SH. 11	D 107320 SH. 11	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL SUPPRESSION POOL VACUUM RELIEF VALVES PSV25704A2 PSV25704B2 PSV25704C2 PSV25704D2 PSV25704E2	9	03/30/90
E-171 SH. 12	D 107320 SH. 12	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL PROCESS & PNEUMATIC ISOLATION VALVES HV25714 HV25704 HV25721 HV25724 HV25723 HV25725 HV25722 SCHEME NO 2Q4161	15	07/16/91
E-171 SH. 13	D 107320 SH. 13	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL ATMOSPHERIC MONITORING VALVES SV25740A SV25740B SV25750A SV25750B SV25780A SV25780B SV25736B SV25776B SV25742A SV25742B SV25752A SV25752B	15	02/08/96
E-171 SH. 14	D 107320 SH. 14	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CONTAINMENT ISOLATION VALVE HV25766 SCHEME NO 2Q4169	10	07/09/96
E-171 SH. 15	D 107320 SH. 15	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CONTAINMENT OUTBOARD ISOLATION VALVE HV25768 SCHEME NO 2Q4170	14	07/09/96
E-171 SH. 19	D 107320 SH. 19	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL STANDBY GAS TREATMENT SYSTEM BYPASS VALVE HV15705 HV15711	14	08/23/95
E-171 SH. 20	D 107320 SH. 20	SCHEMATIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL STANDBY GAS TREATMENT SYSTEM BYPASS VALVES HV25705 HV25711 SCHEME 2Q4173 SCHEME NO 2Q4174	12	02/08/96
E-172 SH. 1	D 107321 SH. 1	SCHEMATIC DIAGRAM CONTAINMENT INSTRUMENT GAS ISOLATION SOLENOID VALVES SV12654A SV12654B SV12661 SV12671 SCHEME NOS 1Q4124 & 1Q4127	10	10/05/94
E-172 SH. 2	D 107321 SH. 2	SCHEMATIC DIAGRAM CONTAINMENT INSTRUMENT GAS COMPRESSOR SUCTION ISOLATION VALVE HV12603 & GAS POSITION INDICATION ZS12643 ZS12648 SCHEME NOS 1Q4129 & 1Q4130	22	03/17/95
E-172 SH. 3	D 107321 SH. 3	SCHEMATIC DIAGRAM CONTAINMENT INSTRUMENT GAS ISOLATION SOLENOID VALVES SV22654A SV22654B SV22661 SV22671 SCHEME NOS 2Q4124 2Q4127	10	01/29/87
E-172 SH. 4	D 107321 SH. 4	SCHEMATIC DIAGRAM CONTAINMENT INSTRUMENT GAS COMPRESSOR SUCTION ISOLATION VALVE HV22603 & GAS POSITION INDICATION ZS22643 ZS22648 SCHEME NOS 2Q4129 2Q4130	20	11/07/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-172 SH. 5	D 107321 SH. 5	SCHEMATIC DIAGRAM CONTAINMENT INSTRUMENT GAS ISOLATION SOLENOID VALVE SV12651 SV12605 SCHEME NO 1Q4123	12	03/17/95
E-177 SH. 6	D 107326 SH. 6	SCHEMATIC DIAGRAM NEUTRON MONITORING SYSTEM APRM SRM & IRM DRIVE	6	05/13/94
E-177 SH. 7	D 107326 SH. 7	BLOCK DIAGRAM NEUTRON MONITORING SYSTEM SOURCE RANGE MONITOR INTERMEDIATE RANGE MONITOR SYSTEMS SCHEME NOS 2Q1191 2Q1195 2Q1204 2Q1203 2Q1205	10	06/30/94
E-177 SH. 8	D 107326 SH. 8	BLOCK DIAGRAM NEUTRON MONITORING SYSTEM TIP SYSTEM	6	04/19/85
E-178 SH. 1	D 107327 SH. 1	BLOCK DIAGRAM EXCESS FLOW CHECK VALVES	9	10/30/90
E-178 SH. 2	D 107327 SH. 2	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES SCHEME NO 1Q4101	3	12/03/86
E-178 SH. 3	D 107327 SH. 3	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	4	07/07/82
E-178 SH. 4	D 107327 SH. 4	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	3	07/31/81
E-178 SH. 5	D 107327 SH. 5	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	1	12/02/77
E-178 SH. 6	D 107327 SH. 6	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	3	09/15/78
E-178 SH. 7	D 107327 SH. 7	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	4	07/24/85
E-178 SH. 8	D 107327 SH. 8	BLOCK DIAGRAM EXCESS FLOW CHECK VALVES	13	02/01/96
E-178 SH. 9	D 107327 SH. 9	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	3	04/23/82
E-178 SH. 10	D 107327 SH. 10	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	9	09/12/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-178 SH. 11	D 107327 SH. 11	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	6	02/28/83
E-178 SH. 12	D 107327 SH. 12	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	4	12/23/82
E-178 SH. 13	D 107327 SH. 13	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES	8	02/01/96
E-178 SH. 14	D 107327 SH. 14	SCHEMATIC DIAGRAM EXCESS FLOW CHECK VALVES SCHEME NO 2Q4106	9	10/17/86
E-180 SH. 7	D 107329 SH. 7	BLOCK DIAGRAM SAFETY RELIEF VALVE FLOW MONITORING SYSTEM	7	09/25/86
E-180 SH. 8	D 107329 SH. 8	BLOCK DIAGRAM SAFETY RELIEF VALVE FLOW MONITORING SYSTEM	4	03/20/95
E-181 SH. 1	D 107330 SH. 1	SCHEMATIC DIAGRAM NUCLEAR BOILER HEAD VENT VALVES HVB211F001 HVB211F002 HVB211F005 SCHEME NO 1Q1607	18	11/22/93
E-181 SH. 3	D 107330 SH. 3	SCHEMATIC DIAGRAM FEEDWATER INLET CHECK VALVES HVB211F032A HVB211F032B	12	08/24/93
E-181 SH. 5	D 107330 SH. 5	SCHEMATIC DIAGRAM STEAM LINE EQUALIZER & DRAIN VALVES HVB211F020 HVB211F021	10	02/21/96
E-181 SH. 8	D 107330 SH. 8	SCHEMATIC DIAGRAM NUCLEAR BOILER HEAD VENT VALVES HVB212F001 HVB212F002 HVB212F005 SCHEME NO 2Q1607	16	11/07/95
E-181 SH. 10	D 107330 SH. 10	SCHEMATIC DIAGRAM FEEDWATER INLET CHECK VALVES HVB212F032A HVB212F032B SCHEME NO 2Q1612	10	07/09/96
E-181 SH. 12	D 107330 SH. 12	SCHEMATIC DIAGRAM STEAM LINE EQUALIZER VALVE HVB212F020	11	06/13/95
E-184 SH. 1	D 107333 SH. 1	SCHEMATIC DIAGRAM LOSS OF COOLANT ACCIDENT ISOLATION SIGNALS	18	04/25/96
E-184 SH. 2	D 107333 SH. 2	SCHEMATIC DIAGRAM DIESEL GENERATOR A AUTO START SIGNALS SCHEME NOS 0Q6003 0Q6004 0Q6005 0Q6006 0Q6007 0Q6008 0Q6009 0Q6010	19	07/02/93

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-184 SH. 3	D 107333 SH. 3	SCHEMATIC DIAGRAM LOSS OF COOLANT ACCIDENT ISOLATION SIGNALS	17	01/03/96
E-185 SH. 1	D 107334 SH. 1	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM	8	10/11/95
E-185 SH. 2	D 107334 SH. 2	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM SCHEME NOS 1Q0905 1Q0906 1Q0907	13	10/11/95
E-185 SH. 3	D 107334 SH. 3	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM SCHEME NOS 1Q0908 1Q0909 1Q0910 1Q0911	10	10/11/95
E-185 SH. 4	D 107334 SH. 4	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM	7	10/11/95
E-185 SH. 5	D 107334 SH. 5	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	12	03/18/92
E-185 SH. 6	D 107334 SH. 6	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	10	03/18/92
E-185 SH. 7	D 107334 SH. 7	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	9	03/18/92
E-185 SH. 8	D 107334 SH. 8	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	10	03/18/92
E-185 SH. 9	D 107334 SH. 9	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	8	03/18/92
E-185 SH. 10	D 107334 SH. 10	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	8	03/18/92
E-185 SH. 11	D 107334 SH. 11	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	23	03/18/92
E-185 SH. 12	D 107334 SH. 12	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NO 1Q7002	19	03/18/92
E-185 SH. 12A	D 107334 SH. 12	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 1Q7003 GHD 964 AS BUILT FOR SYSTEM 024	2	09/08/87

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-185 SH. 12B	D 107334 SH. 12	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT TRANSFER CONTROL DIESEL GENERATOR E BLDG SCHEME NO 1Q7003 GHD 964 AS BUILT FOR SYSTEM 024	2	09/08/87
E-185 SH. 12C	D 107334 SH. 12	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT TRANSFER CONTROL DIESEL GENERATOR E BLDG SCHEME NO 1Q7003 GHN 1826 GH/EDG 1574 AS BUILT FOR SYSTEM 024 023B	3	09/08/87
E-185 SH. 12D	D 107334 SH. 12	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NO 1Q7002	2	11/16/90
E-185 SH. 13	D 107334 SH. 13	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	7	03/18/92
E-185 SH. 14	D 107334 SH. 14	BLOCK DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NOS 1Q7001 1Q7002	13	05/24/90
E-185 SH. 15	D 107334 SH. 15	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM	8	01/03/96
E-185 SH. 16	D 107334 SH. 16	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM SCHEME NOS 2Q0904 2Q0905 2Q0906 2Q0907	10	01/03/96
E-185 SH. 17	D 107334 SH. 17	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM SCHEME NOS 2Q0908 2Q0909 2Q0910 2Q0911	7	01/03/96
E-185 SH. 18	D 107334 SH. 18	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM	8	05/22/95
E-185 SH. 19	D 107334 SH. 19	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	7	02/26/92
E-185 SH. 20	D 107334 SH. 20	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	9	03/18/92
E-185 SH. 21	D 107334 SH. 21	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	8	03/18/92
E-185 SH. 22	D 107334 SH. 22	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	9	03/18/92
E-185 SH. 23	D 107334 SH. 23	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	10	03/18/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-185 SH. 24	D 107334 SH. 24	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NOS 2Q7001 & 2Q7002	12	05/06/94
E-185 SH. 25	D 107334 SH. 25	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NO 2Q7001	21	03/18/92
E-185 SH. 26	D 107334 SH. 26	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NO 2Q7002	20	03/18/92
E-185 SH. 26A	D 107334 SH. 26	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 2Q7003 GHD 214 AS BUILT FOR SYSTEM 024	1	09/08/87
E-185 SH. 26B	D 107334 SH. 26	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 2Q7003 GHD 964 AS BUILT FOR SYSTEM 024	2	09/08/87
E-185 SH. 26C	D 107334 SH. 26	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 2Q7003 GHN 1826 GH/EDG 1574 AS BUILT FOR SYSTEM 024 023B	3	09/08/87
E-185 SH. 26D	D 107334 SH. 26	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NO 2Q7002	4	03/18/92
E-185 SH. 27	D 107334 SH. 27	SCHEMATIC DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT	6	03/18/92
E-185 SH. 28	D 107334 SH. 28	BLOCK DIAGRAM BYPASS INDICATION SYSTEM BALANCE OF PLANT SCHEME NOS 2Q7001 2Q7002	16	03/18/92
E-185 SH. 29	D 107334 SH. 29	SCHEMATIC DIAGRAM MOTOR OVERLOAD BYPASS SYSTEM	7	05/24/90
E-185 SH. 31	D 107334 SH. 31	SCHEMATIC DIAGRAM MOTOR OVERLOAD BYPASS SYSTEM	3	09/19/83
E-185 SH. 32	D 107334 SH. 32	SCHEMATIC DIAGRAM MOTOR OVERLOAD BYPASS SYSTEM	4	01/05/87
E-185 SH. 34	D 107334 SH. 34	SCHEMATIC DIAGRAM CHANNEL C DIVISION I ISOLATION RESIDUAL HEAT REMOVAL SYSTEM SCHEME NO 1Q7051	14	12/17/89
E-185 SH. 35	D 107334 SH. 35	SCHEMATIC DIAGRAM CHANNEL D DIVISION II ISOLATION RESIDUAL HEAT REMOVAL SYSTEM SCHEME NO 1Q7052	13	12/17/89

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-185 SH. 36	D 107334 SH. 36	SCHEMATIC DIAGRAM CHANNEL C DIVISION I ISOLATION RESIDUAL HEAT REMOVAL SYSTEM SCHEME NO 2Q7051	9	03/22/91
E-185 SH. 37	D 107334 SH. 37	SCHEMATIC DIAGRAM CHANNEL D DIVISION II ISOLATION RESIDUAL HEAT REMOVAL SYSTEM SCHEME NO 2Q7052	9	03/10/94
E-185 SH. 38	D 107334 SH. 38	SCHEMATIC DIAGRAM CHANNEL C DIVISION I ISOLATION CORE SPRAY SYSTEM	10	01/12/94
E-185 SH. 39	D 107334 SH. 39	SCHEMATIC DIAGRAM CHANNEL D DIVISION II ISOLATION CORE SPRAY SYSTEM	8	07/22/93
E-185 SH. 40	D 107334 SH. 40	SCHEMATIC DIAGRAM CHANNEL C DIVISION I ISOLATION CORE SPRAY SYSTEM	7	10/07/92
E-185 SH. 41	D 107334 SH. 41	SCHEMATIC DIAGRAM CHANNEL D DIVISION II ISOLATION CORE SPRAY SYSTEM	6	10/07/92
E-185 SH. 42	D 107334 SH. 42	SCHEMATIC DIAGRAM DIVISIONS I & II ISOLATION RESIDUAL HEAT REMOVAL SYSTEM	7	12/17/89
E-185 SH. 43	D 107334 SH. 43	SCHEMATIC DIAGRAM DIVISIONS I & II ISOLATION RESIDUAL HEAT REMOVAL SYSTEM	5	03/21/91
E-185 SH. 46	D 107334 SH. 46	SCHEMATIC DIAGRAM ISOLATION CIRCUITS RESIDUAL HEAT REMOVAL SYSTEM	6	06/28/85
E-185 SH. 47	D 107334 SH. 47	SCHEMATIC DIAGRAM CHANNEL D DIVISION I & CHANNEL C DIVISION II ISOLATION RESIDUAL HEAT REMOVAL SYSTEM	4	06/28/85
E-187 SH. 1	D 107336 SH. 1	SCHEMATIC DIAGRAM CONTAINMENT HYDROGEN RECOMBINER 1E440A CONTROL SUPERSEDES E-163(3) PER BLP 29186 SCHEME NO 1Q4191	18	08/19/93
E-187 SH. 2	D 107336 SH. 2	SCHEMATIC DIAGRAM CONTAINMENT HYDROGEN RECOMBINER 2E440A CONTROL SCHEME NO 2Q4191	11	08/19/93
E-189 SH. 1	D 107338 SH. 1	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL INBOARD VALVE SYSTEM HVE321F001B HVE321F001F HVE321F001K HVE321F001P HVE321F002B HVE321F002F HVE321F002K HVE321F002P	8	03/06/92
E-189 SH. 2	D 107338 SH. 2	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVES LEAKAGE CONTROL SYSTEM INBOARD SYSTEM AIR BLOWER 1K208	4	09/28/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-189 SH. 3	D 107338 SH. 3	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVES LEAKAGE CONTROL SYSTEM OUTBOARD SYSTEM AIR BLOWER 1K209A 1K209B	6	10/11/83
E-189 SH. 4	D 107338 SH. 4	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM PIPE HEATERS 1E203A 1E203B 1E203C 1E203D	4	09/27/83
E-189 SH.. 5	D 107338 SH. 5	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM INSTRUMENTATION FOR MOTOR OPERATED VALVES HVE321F001B HVE321F001F HVE321F001K HVE321F001P HVE321F002B SCHEME 1Q6531	10	01/04/94
E-189 SH. 6	D 107338 SH. 6	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL INBOARD SYSTEM VALVES HVE322F001B HVE322F001F HVE322F001K HVE322F001P HVE322F002B HVE322F002F HVE322F002K HVE322F002P	11	01/09/87
E-189 SH. 7	D 107338 SH. 7	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM INBOARD SYSTEM AIR BLOWER 2K208	3	09/30/83
E-189 SH. 8	D 107338 SH. 8	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVES LEAKAGE CONTROL SYSTEM OUTBOARD SYSTEM AIR BLOWERS 2K209A 2K209B	7	09/30/83
E-189 SH. 9	D 107338 SH. 9	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL SYSTEM PIPE HEATERS 2E203A 2E203B 2E203C 2E203D	4	09/30/83
E-189 SH. 10	D 107338 SH. 10	SCHEMATIC DIAGRAM MAIN STEAM ISOLATION VALVES LEAKAGE CONTROL SYSTEM INSTRUMENTATION FOR MOTOR OPERATED VALVES HVE322F001B HVE322F001F HVE322F001K HVE322F001P HVE322F002B HVE22F002F	11	06/30/94
E-192 SH. 7	D 107341 SH. 7	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM ZONE III RECIRCULATION FANS 0V201A 0V201B	9	12/31/91
E-192 SH. 8	D 107341 SH. 8	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM EMERGENCY SWITCHGEAR ROOM UNIT COOLER 1V222B SCHEME NO 1V2541	20	07/16/91
E-192 SH. 11	D 107341 SH. 11	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM RECIRCULATION SYSTEM DAMPERS HD07543A HD07543B HD07545A HD07545B SCHEME NO 0V2152 0V2151 0V2153 0V2150	7	12/21/88
E-192 SH. 12	D 107341 SH. 12	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM ZONE I & III ISOLATION DAMPERS HD17524A HD17524B HD17576A HD17576B HD17586A HD17586B HD17502A HD17502B HD17514A HD17514B HD17564A HD17564B	10	04/18/96
E-192 SH. 14	D 107341 SH. 14	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM AIR LOCK ISOLATION DAMPERS HD17534A HD17534C HD17534D HD17534E HD17534H SCHEME NOS 1V2589 & 1V2536	7	10/16/86
E-192 SH. 19	D 107341 SH. 19	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM DRYWELL BURP & PURGE LINE ISOLATION DAMPERS HD17508A HD17508B	12	07/10/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-192 SH. 20	D 107341 SH. 20	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM BACKDRAFT ISOLATION DAMPERS 17606A	7	09/30/83
E-192 SH. 27	D 107341 SH. 27	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM RECIRCULATING ISOLATION DAMPERS HD27601A HD27601B HD27602A HD27602B HD27657A HD27657B	14	07/10/91
E-192 SH. 31	D 107341 SH. 31	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM EMERGENCY SWITCHGEAR ROOM UNIT COOLERS 2V222B SCHEME NO 2V2541	18	12/31/91
E-192 SH. 32	D 107341 SH. 32	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM SWITCHGEAR COOLING DAMPERS HD27630A HD27630B SCHEME NOS 2V2545 2V2544	12	11/09/95
E-192 SH. 34	D 107341 SH. 34	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM ZONE II & III ISOLATION DAMPERS HD27524A HD27524B HD27576A HD27576B HD27586A HD27586B HD27502A HD27502B HD27514A HD27514B HD27564A HD27564B	8	11/27/95
E-192 SH. 35	D 107341 SH. 35	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM AIR LOCK ISOLATION DAMPERS HD27534A HD27534C HD27534D HD27537E HD27537F HD27537G HD27537H HD27537I SCHEME NOS 2V2589 & 2V2536	7	10/14/86
E-192 SH. 36	D 107341 SH. 36	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM PRIMARY CONTAINMENT ISOLATION DAMPER HD27651 SCHEME NO 2V2570	8	05/01/87
E-192 SH. 39	D 107341 SH. 39	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM DRYWELL BURP & PURGE HD17508A HD17508B SCHEME NO 2V2542	13	11/27/95
E-192 SH. 40	D 107341 SH. 40	SCHEMATIC DIAGRAM HVAC REACTOR BLDG VENT SYSTEM BACKDRAFT ISOLATION DAMPERS	9	04/05/94
E-193 SH. 1	D 107342 SH. 1	SCHEMATIC DIAGRAM HVAC DIESEL GENERATOR BLDG VENT SYSTEM VENT SUPPLY FANS 0V512A 0V512B 0V512C 0V512D SCHEME NO 0V5100	16	01/16/92
E-193 SH. 1A	D 107342 SH. 1	SCHEMATIC DIAGRAM HVAC DIESEL GENERATOR BLDG VENT SYSTEMS VENT SUPPLY FANS TRANSFER SCHEME 0V512B GHD 214 AS BUILT FOR SYSTEM 028B	3	07/22/90
E-193 SH. 1B	D 107342 SH. 1	SCHEMATIC DIAGRAM HVAC DIESEL GENERATOR BLDG VENTILATION SYSTEM VENTILATION SUPPLY FANS TRANSFER SCHEME 0V512C GHD 214 AS BUILT FOR SYSTEM 028B	3	01/16/92
E-193 SH. 5	D 107342 SH. 5	SCHEMATIC & CONNECTION DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SYSTEM BATTERY ROOM EXHAUST FAN 0V511E NO 0V0105 GHD 1214 GH/EDG AS BUILT FOR SYSTEM 024A 013 028A	7	10/21/87
E-193 SH. 6	D 107342 SH. 6	CONNECTION DIAGRAM MCC 0B565 CUBICLE 2A	11	07/23/90

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-193 SH. 7	D 107342 SH. 7	SCHEMATIC & CONNECTION DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SYSTEM VENTILATION SUPPLY FAN 0V512E2 NO 0V0101 GHN 1826 GH/EDG 1574 AS BUILT FOR SYSTEM 024A 028B	11	12/19/88
E-193 SH. 8	D 107342 SH. 8	SCHEMATIC & CONNECTION DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SYSTEM VENTILATION EXHAUST FAN 0V512E3 NO 0V0103 GHD 1696 GH/EDG 1563 AS BUILT FOR SYSTEM 028BSCHEME NO 0V0103	9	02/02/88
E-193 SH. 9	D 107342 SH. 9	SCHEMATIC & CONNECTION DIAGRAM DAMPER ACTUATORS GHD 1152 GH/EDG 1246 AS BUILT FOR SYSTEM 007 028B	4	09/02/87
E-193 SH. 10	D 107342 SH. 10	SCHEMATIC & CONNECTION DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SYSTEM VENTILATION EXHAUST FAN 0V512E4 NO 0V0104 GHD 1696 GH/EDG 1563 AS BUILT FOR SYSTEM 028 028B	9	02/02/88
E-197 SH. 1	D 107346 SH. 1	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM AIR SUPPLY FANS 0V101A 0V101B	15	01/16/92
E-197 SH. 2	D 107346 SH. 2	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE AIR COOLER UNIT FAN 0V103A SCHEME NO 0V1104	16	03/06/92
E-197 SH. 3	D 107346 SH. 3	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM RADIATION & CHLORINATOR SIGNALS I SCHEME NO 0V1160	20	05/05/94
E-197 SH. 4	D 107346 SH. 4	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM ISOLATION DAMPERS HD07802A HD07802B	8	09/27/83
E-197 SH. 5	D 107346 SH. 5	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM FILTER UNITS 0F125A 0F125B	15	12/09/92
E-197 SH. 6	D 107346 SH. 6	SCHEMATIC DIAGRAM CONTROL STRUCTURE HVAC ISOLATION DAMPER HD07824A1	10	05/29/91
E-197 SH. 7	D 107346 SH. 7	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM RADIATION & CHLORINE SIGNALS II SCHEME NO 0V1161	20	05/05/94
E-197 SH. 8	D 107346 SH. 8	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM ISOLATION DAMPERS HD07872A HD07872B	7	09/28/83
E-197 SH. 9	D 107346 SH. 9	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM ISOLATION DAMPERS HD07833A HD07833B	12	09/29/83
E-197 SH. 10	D 107346 SH. 10	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM AIR SUPPLY DAMPERS HD07812A HD07814A HD07814B HD07811A HD07811B & MODULATING INLET VAN DAMPER FD07816A FD07816B SCHEME 0V1146	7	09/25/86

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-197 SH. 11	D 107346 SH. 11	SCHEMATIC DIAGRAM HVAC CONTROL ROOM EMERGENCY FRESH AIR SYSTEM AIR COOLER UNIT DAMPERS HD07813A HD07813B HD07801A HD07801B	12	03/20/92
E-198 SH. 1	D 107347 SH. 1	SCHEMATIC DIAGRAM HVAC BATTERY ROOM VENT SYSTEM EXHAUST FAN 0V116A SCHEME NO 0V1124	11	12/31/91
E-198 SH. 2	D 107347 SH. 2	SCHEMATIC DIAGRAM HVAC BATTERY ROOM VENT SYSTEM EXHAUST DAMPER HD07871A1 HD07871B1 SCHEME NO 0V1136	6	05/24/90
E-198 SH. 3	D 107347 SH. 3	SCHEMATIC DIAGRAM HVAC BATTERY ROOM VENT SYSTEM CHLORINE ISOLATION DAMPERS HD07821A2 HD07821B2 SCHEME NO 0V1196	10	12/31/91
E-2 SH. 3	E 107151 SH. 3	SCHEMATIC PHASING DIAGRAM 4.16KV & 480V ENGINEERED SAFEGUARD SYSTEMS	6	10/21/87
E-2 SH. 4	E 107151 SH. 4	SCHEMATIC PHASING DIAGRAM 4.16KV & 480V ENGINEERED SAFEGUARD SYSTEMS MAKEUP WATER SYSTEM	5	04/18/84
E-2 SH. 5	E 107151 SH. 5	SINGLE LINE DIAGRAM SYNCHRONIZING	8	01/29/96
E-2 SH. 6	E 107151 SH. 6	SINGLE LINE DIAGRAM SYNCHRONIZING	9	07/18/95
E-2 SH. 7	E 107151 SH. 7	SCHEMATIC PHASING DIAGRAM DIESEL GENERATOR E K GHD 1711 GH/EDG 1563 AS BUILT FOR SYSTEM 003 005 024	2	08/22/86
E-201 SH. 1	D 107350 SH. 1	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM LOSS OF COOLANT ACCIDENT TRIP & RESET DIVISION I SCHEME NO 0V1450	24	07/06/94
E-201 SH. 2	D 107350 SH. 2	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM LOSS OF COOLANT ACCIDENT TRIP & RESET I	25	07/06/94
E-201 SH. 3	D 107350 SH. 3	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM LOSS OF COOLANT ACCIDENT TRIP & RESET DIVISION II SCHEME NO 0V1451	28	11/27/95
E-201 SH. 4	D 107350 SH. 4	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM LOSS OF COOLANT ACCIDENT TRIP & RESET II	22	07/06/94
E-201 SH. 5	D 107350 SH. 5	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM EXHAUST FAN 0V109A 0V109B SCHEME NO 0V1400 0V1401	25	03/06/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-201 SH. 6	D 107350 SH. 6	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM DAMPERS TD07560A TD07560B SCHEME NOS 0V1478 0V1479 0V1454 0V1455	13	03/06/92
E-201 SH. 7	D 107350 SH. 7	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM OUTSIDE AIR DAMPERS FD07551A2 FD07551B2 SCHEME NOS 0V1456 0V1457 0V1470 0V1471	15	04/29/96
E-201 SH. 8	D 107350 SH. 8	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM DAMPERS HD07552A HD07552B HD07553A HD07553B SCHEME NOS 0V1452 0V1466 0V1453 0V1467	5	10/14/86
E-201 SH. 9	D 107350 SH. 9	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM DAMPERS HD07555A & HD07555B	16	03/06/92
E-201 SH. 10	D 107350 SH. 10	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM DAMPERS PDD07554 A PDD07554B FD07551A FD07551B & MOTORS PDDM07554A PDDM07554B FDM07551A FDM07551B	8	04/13/93
E-201 SH. 11	D 107350 SH. 11	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM CHARCOAL FILTER WATER VALVES SV07551A1 SV07551A2 SV07551A3 SV07551A4 SV07551B1 SV07551B2 SV07551B3 SV07551B4 SCHEME NO 0V1464	9	10/29/90
E-201 SH. 12	D 107350 SH. 12	SCHEMATIC DIAGRAM HVAC STANDBY GAS TREATMENT SYSTEM HIGH RADIATION & PRESSURE SCHEME NOS 0V1490 0V1491	16	04/29/96
E-202 SH. 1	D 107351 SH. 1	SCHEMATIC DIAGRAM STANDBY GAS TREATMENT VENT SYSTEM EQUIPMENT ROOM EXHAUST FANS 0V118A 0V118B SCHEME NO 0V1128	20	06/12/92
E-202 SH. 4	D 107351 SH. 4	SCHEMATIC DIAGRAM STANDBY GAS TREATMENT SYSTEM FILTER DRAIN VALVES	5	09/27/83
E-204 SH. 1	D 107353 SH. 1	BLOCK DIAGRAM VENTILATION RADIATION MONITORING STANDBY GAS TREATMENT SYSTEM EXHAUST	6	09/12/83
E-204 SH. 2	D 107353 SH. 2	BLOCK DIAGRAM VENTILATION RADIATION MONITORING CONTROL STRUCTURE OUTSIDE AIR	4	09/12/83
E-204 SH. 4	D 107353 SH. 4	BLOCK DIAGRAM VENTILATION RADIATION MONITORING REFUELING FLOOR	5	09/12/83
E-204 SH. 5	D 107353 SH. 5	BLOCK DIAGRAM VENTILATION RADIATION MONITORING REACTOR BLDG VENT EXHAUST	5	09/12/83
E-204 SH. 7	D 107353 SH. 7	BLOCK DIAGRAM VENTILATION RADIATION MONITORING REFUELING FLOOR	2	12/02/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-207 SH. 1	D 107356 SH. 1	SCHEMATIC DIAGRAM HVAC ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT SYSTEM ENGINEERED SAFEGUARD SERVICE WATER PUMP EXHAUST FANS 0V521A 0V521B 0V521C 0V521D SCHEME NO 0V5105	15	12/31/91
E-207 SH. 2	D 107356 SH. 2	SCHEMATIC DIAGRAM HVAC ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT SYSTEM & MOTOR OPERATED DAMPERS TDM08206A1 A2 A3 A4 B1 B2 B3 B4 C1 C2 C3 C4 D1 D2 D3 D4	6	10/11/83
E-207 SH. 3	D 107356 SH. 3	SCHEMATIC DIAGRAM HVAC ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT SYSTEM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP EXHAUST FANS 1V506A 1V506B SCHEME NO 1V5500	17	12/31/91
E-207 SH. 4	D 107356 SH. 4	SCHEMATIC DIAGRAM HVAC ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT SYSTEM RESIDUAL HEAT REMOVAL SERVICE WATER MOTOR OPERATED DAMPERS TDM18201A1 A2 A3 A4 B1 B2 B3 B4	6	09/26/83
E-207 SH. 5	D 107356 SH. 5	SCHEMATIC DIAGRAM HVAC ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT SYSTEM RESIDUAL HEAT REMOVAL SERVICE WATER PUMP EXHAUST FANS 2V506A 2V506B SCHEME NO 2V5500	11	12/31/91
E-207 SH. 6	D 107356 SH. 6	SCHEMATIC DIAGRAM HVAC ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT SYSTEM RESIDUAL HEAT REMOVAL SERVICE WATER MOTOR OPERATED DAMPERS TDM28201A1 A2 A3 A4 B1 B2 B3 B4	3	12/16/83
E-21-16 SH. 1	E 107615 SH. 16	RACEWAY LAYOUT CONTROL STRUCTURE AREA 21 PLAN AT ELEVATION 729-0 & 741-1	21	08/14/87
E-21-4 SH. 1	E 107615 SH. 4	RACEWAY LAYOUT CONTROL STRUCTURE AREA 21 PLAN OF ELEVATION 714-0	27	10/28/86
E-21-5 SH. 1	E 107615 SH. 5	SEISMIC CLASS 1 TRAY SUPPORTS & EXPOSED CONDUIT CONTROL STRUCTURE AREA 21 PLAN OF ELEVATION 714-0	28	07/10/86
E-21-6 SH. 1	E 107615 SH. 6	RACEWAY LAYOUT CONTROL STRUCTURE AREA 21 PLAN AT ELEVATION 728-1	27	07/02/86
E-21-7 SH. 1	E 107615 SH. 7	RACEWAY LAYOUT CONTROL STRUCTURE AREA 21 PLAN OF ELEVATION 753-0	22	11/17/89
E-21-8 SH. 1	E 107615 SH. 8	RACEWAY LAYOUT CONTROL STRUCTURE CONDUIT & TRAY BELOW RAISED FLOOR AREA 21 PLAN OF ELEVATION 753-0	28	07/20/90
E-213 SH. 1	D 107362 SH. 1	SCHEMATIC DIAGRAM HVAC TURBINE BLDG CHILLED WATER SYSTEM CHILLER 1K102A CHILLER A COMPRESSOR MOTOR SUPERSEDES E109-11 SHEET 57	20	07/06/94
E-213 SH. 2	D 107362 SH. 2	SCHEMATIC DIAGRAM HVAC TURBINE BLDG CHILLED WATER SYSTEM CHILLER 1K102B CHILLER B COMPRESSOR MOTOR SCHEME NO 1V1601 SUPERSEDES E109-12 SHEET 56	22	07/11/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-213 SH. 10	D 107362 SH. 10	SCHEMATIC DIAGRAM HVAC TURBINE BLDG CHILLED WATER SYSTEM CONTROL COOL COILS CONTROL VALVES FOR COMPRESSOR MOTOR 1K102A 1K102B RUN TRIP	10	12/03/91
E-213 SH. 12	D 107362 SH. 12	SCHEMATIC DIAGRAM HVAC TURBINE BLDG CHILLED WATER SYSTEM CHILLER 2K102A CHILLER A COMPRESSOR MOTOR SUPERSEDES E109-16 SHEET 55	14	10/09/95
E-213 SH. 13	D 107362 SH. 13	SCHEMATIC DIAGRAM HVAC TURBINE BLDG CHILLED WATER SYSTEM CHILLER 2K102B CHILLER B COMPRESSOR MOTOR SUPERSEDES E109-18 SHEET 51 SCHEME NO 2V1601	17	10/09/95
E-213 SH. 21	D 107362 SH. 21	SCHEMATIC DIAGRAM HVAC TURBINE BLDG CHILLED WATER SYSTEM COMPRESSOR MOTOR RUN TRIP FOR CHILLERS 2K102A 2K102B	4	12/03/91
E-214 SH. 1	D 107363 SH. 1	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM CHILLER 0K112A COMPRESSOR MOTOR	19	07/05/95
E-214 SH. 2	D 107363 SH. 2	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM CHILLER B COMPRESSOR MOTOR SUPERSEDES E109-14 SHEET 54	21	07/05/95
E-214 SH. 3	D 107363 SH. 3	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM CHILLER 0K112A AUXILIARIES OIL PUMPS 0P122A 0P122B & REFRIGERANT TRANSFER PUMP 0P112A 0P112B & OIL HEATER	8	03/27/90
E-214 SH. 4	D 107363 SH. 4	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM CHILLED WATER CIRCULATING PUMPS 0P162A 0P162B SCHEME NO 0V1206	25	12/17/91
E-214 SH. 5	D 107363 SH. 5	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM CONDENSER WATER CIRCULATING PUMPS 0P170A 0P170B	13	12/31/91
E-214 SH. 6	D 107363 SH. 6	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM EMERGENCY CONDENSER WATER CIRCULATING PUMPS 0P171A & 0P171B	12	10/26/90
E-214 SH. 7	D 107363 SH. 7	BLOCK DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM 0K112A 0K112B SCHEME NO 0V1250 0V1251	15	05/31/90
E-214 SH. 8	D 107363 SH. 8	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM CHILLER 0K112A 0K112B LOOP & FLOW CONTROL SCHEME NOS 0V1256 0V1252 0V1906	20	11/17/92
E-214 SH. 9	D 107363 SH. 9	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER LOSS OF OFFSITE POWER RESET	16	06/25/92
E-214 SH. 11	D 107363 SH. 11	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM MIXING VALVES TV08612A TV08612B TV08643A TV08643B TV08652A TV08652B TV08662A TV08662B SCHEME NOS 0V1214 0V1218	12	06/03/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-214 SH. 12	D 107363 SH. 12	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE CHILLED WATER SYSTEM FAN COOLER MODES FOR 0V115A 0V115B	12	05/17/95
E-216 SH. 1	D 107365 SH. 1	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM CHILLER 1K206A CHILLER A COMPRESSOR MOTOR SUPERSEDES E109-11 SHEET 52	20	12/27/94
E-216 SH. 2	D 107365 SH. 2	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM CHILLER 1K206B CHILLER B COMPRESSOR MOTOR SUPERSEDES E109-12 SHEET 52	21	07/05/95
E-216 SH. 9	D 107365 SH. 9	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM DRYWELL COOLING WATER CONTROL VALVES FOR CHILLER 1K206A & 1K206B RUN TRIP	15	04/11/95
E-216 SH. 11	D 107365 SH. 11	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM DRYWELL OUTBOARD COOLING ISOLATION VALVES HV18781A1 HV18781A2 HV18781B1 HV18781B2 HV18791A1 HV18791A2 HV18791B1 HV18791B2	17	03/04/91
E-216 SH. 12	D 107365 SH. 12	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM CHILLER A COMPRESSOR MOTOR CHILLER 2K206A SUPERSEDES E109-19 SHEET 48	19	12/06/94
E-216 SH. 13	D 107365 SH. 13	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM CHILLER B COMPRESSOR MOTOR CHILLER 2K206B SCHEME NO 2V2601 SUPERSEDES E109-17 SHEET 48	18	12/12/94
E-216 SH. 22	D 107365 SH. 22	SCHEMATIC DIAGRAM HVAC REACTOR BLDG CHILLED WATER SYSTEM DRYWELL OUTBOARD COOLING ISOLATION VALVES HV28781A1 HV28781A2 HV28781B1 HV28781B2 HV28791A1 HV28791A2 HV28791B1 HV28791B2	17	08/17/88
E-216 SH. 24	D 107365 SH. 24	SCHEME NO 2V2670 HVAC REACTOR BLDG CHILLED WATER SYSTEM INBOARD DRYWELL COOLING ISOLATION VALVES HV28782A1 HV28782A2 HV28782B1 HV28782B2 HV28792A1 HV28792A2 HV28792B1 HV28792B2	16	07/14/88
E-22 SH. 2	E 107171 SH. 2	SCHEMATIC METER & RELAY DIAGRAMS 13.8KV STARTUP BUS 0A103 & 0A105 SCHEME 0A0351	25	12/12/95
E-220 SH. 1	D 107369 SH. 1	SCHEMATIC DIAGRAM HVAC REACTOR CORE ISOLATION COOLING PUMP ROOM COOLING FANS 1V208A 1V208B SCHEME NO 1V2513	16	07/07/92
E-220 SH. 2	D 107369 SH. 2	SCHEMATIC DIAGRAM HVAC REACTOR CORE ISOLATION COOLING PUMP ROOM COOLING FANS 2V208A 2V208B SCHEME NO 2V2513	10	10/07/92
E-221 SH. 1	D 107370 SH. 1	SCHEMATIC DIAGRAM HVAC HIGH PRESSURE COOLANT INJECTION PUMP ROOM COOLING FANS 1V209A 1V209B	12	12/31/91
E-221 SH. 2	D 107370 SH. 2	SCHEMATIC DIAGRAM HVAC HIGH PRESSURE COOLANT INJECTION PUMP ROOM COOLING FANS 2V209A 2V209B	8	12/31/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-222 SH. 1	D 107371 SH. 1	SCHEMATIC DIAGRAM HVAC CORE SPRAY PUMP ROOM COOLING FANS	11	05/22/92
E-222 SH. 2	D 107371 SH. 2	SCHEMATIC DIAGRAM HVAC CORE SPRAY PUMP ROOM COOLING FANS 2V211A 2V211B 2V211C 2V211D	9	09/03/92
E-223 SH. 1	D 107372 SH. 1	SCHEMATIC DIAGRAM HVAC RESIDUAL HEAT REMOVAL PUMP ROOM COOLING FANS 1V210A 1V210B 1V210C 1V210D SCHEME NO 1V2516	12	01/16/92
E-223 SH. 2	D 107372 SH. 2	SCHEMATIC DIAGRAM HVAC RESIDUAL HEAT REMOVAL PUMP ROOM COOLING FANS 2V210A 2V210B 2V210C 2V210D SCHEME NO 2V2517	10	01/16/92
E-224 SH. 1	D 107373 SH. 1	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS 1V411A 1V411B 1V412A 1V412B 1V413A 1V413B 1V414A 1V414B 1V415A 1V415B 1V416A 1V416B 1V417A 1V417B	20	07/01/94
E-224 SH. 2	D 107373 SH. 2	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS	8	07/10/85
E-224 SH. 3	D 107373 SH. 3	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS HIGH DRYWELL PRESSURE & TEST TRAIN A HS17701A HS17701B	12	07/10/85
E-224 SH. 4	D 107373 SH. 4	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS 2V411A 2V411B 2V412A 2V412B 2V413A 2V413B 2V414A 2V414B 2V415A 2V415B 2V416A 2V416B 2V417A 2V417B	11	10/29/92
E-224 SH. 5	D 107373 SH. 5	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS	7	04/04/91
E-224 SH. 6	D 107373 SH. 6	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS HIGH DRYWELL PRESSURE & TEST TRAIN A HS27701A HS27701B	9	04/16/91
E-224 SH. 7	D 107373 SH. 7	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FAN FLOW SWITCHES PDSL17711A&B PDSL17721A&B PDSL17731A&B PDSL17741A&B PDSL17751A&B PDSL17761A&B PDSL17771A&B	11	05/17/91
E-224 SH. 8	D 107373 SH. 8	SCHEMATIC DIAGRAM HVAC DRYWELL AREA COOLING FANS FLOW SWITCHES PDSL27711A&B PDSL27721A&B PDSL27731A&B PDSL27741A&B PDSL27751A&B PDSL27761A&B PDSL27771A&B SCHEME NO 2V4560	9	06/28/91
E-229 SH. 1	D 107378 SH. 1	SCHEMATIC DIAGRAM COMPUTER ROOM FLOOR AIR CONDITIONING UNIT FAN 0V115A 0V115B 0V117A 0V117B SCHEME 0V1122 0V1123 0V1126 0V1127 AREA 21 ELEVATION 783-0	15	03/13/92
E-229 SH. 2	D 107378 SH. 2	SCHEMATIC DIAGRAM HVAC COMPUTER ROOM AIR CONDITIONING DAMPER HD07821A SCHEME NO 0V1132	8	03/30/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-23 SH. 1	E 107172 SH. 1	SCHEMATIC METER & RELAY DIAGRAM 4.16KV SYSTEM ENGINEERED SAFEGUARD	23	10/19/93
E-23 SH. 2	E 107172 SH. 2	SCHEMATIC METER & RELAY DIAGRAM 4.16KV SYSTEM ENGINEERED SAFEGUARD	20	10/25/93
E-23 SH. 3	E 107172 SH. 3	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV SYSTEM ENGINEERED SAFEGUARD SCHEME NOS 2A0401 & 2A403	21	05/19/94
E-23 SH. 4	E 107172 SH. 4	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV SYSTEM ENGINEERED SAFEGUARD SCHEME NOS 2A0402 & 2A0404	22	05/19/94
E-23 SH. 6	E 107172 SH. 6	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV DIESEL GENERATORS A B C & D SCHEME NO 0G2401	24	12/12/95
E-23 SH. 6A	E 107172 SH. 6	SCHEMATIC METER & RELAY 4.16KV DIESEL GENERATORS A B C & D TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 0G2405 GHD 1152 GH/EDG 1246 AS BUILT FOR SYSTEM 024	2	08/10/87
E-23 SH. 7	E 107172 SH. 7	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV DIESEL GENERATOR A B C & D TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 0G2405 GHD 1076 GH/EDG 1205 AS BUILT FOR SYSTEM 024	2	08/10/87
E-23 SH. 8	E 107172 SH. 8	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV DIESEL GENERATORS A B C & D TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 0G2405 GHD 1076 GH/EDG 1205 AS BUILT FOR SYSTEM 024	2	08/10/87
E-23 SH. 8A	E 107172 SH. 8	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV DIESEL GENERATORS A B C D TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 0G2405 GHD 214 AS BUILT FOR SYSTEM 024	1	08/10/87
E-23 SH. 9	E 107172 SH. 9	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV DIESEL GENERATORS A B C D TRANSFER CONTROL DIESEL GENERATOR E SCHEME NO 0G2405 GHD 1076 GH/EDG 1205 AS BUILT FOR SYSTEM 024	2	08/10/87
E-23 SH. 10	E 107172 SH. 10	SCHEMATIC METER & RELAY DIAGRAMS 4.16KV DIESEL GENERATOR E K GHD 1555 GH/EDG 1467 AS BUILT FOR SYSTEM 024 024C SCHEME NOS 0A0391 0G0409	7	10/05/90
E-23 SH. 11	E 107172 SH. 11	SCHEMATIC DIAGRAM SWITCH CONTACT DEVELOPMENT TRANSFER PANELS 0C512A AREA 44 ELEVATION 710	3	09/05/90
E-23 SH. 12	E 107172 SH. 12	SCHEMATIC DIAGRAM SWITCH CONTACT DEVELOPMENT TRANSFER PANEL 0C512E-A AREA 81 ELEVATION 656	3	09/05/90
E-23 SH. 13	E 107172 SH. 13	SCHEMATIC METER & RELAY DIAGRAM 4.16KV SYSTEM DIESEL GENERATOR E K GHD 1706 GH/EDG 1563 AS BUILT FOR SYSTEM 003 005 024 SCHEME NO 0G0419	8	12/04/90

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-23 SH. 14	E 107172 SH. 14	SCHEMATIC METER & RELAY DIAGRAMS TEST FACILITY FEEDER & TRANSFORMER DX565 FEEDER DIESEL GENERATOR K GHD 1211 GH/EDG 1277 AS BUILT FOR SYSTEM 003 & 005 ONLY	3	06/10/93
E-24 SH. 1	E 107173 SH. 1	SCHEMATIC METER & RELAY DIAGRAM 480V ENGINEERING SAFEGUARD SYSTEM LOAD CENTERS	16	06/01/93
E-242 SH. 3	D 107391 SH. 3	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE HEATING SYSTEM STANDBY GAS TREATMENT SYSTEM FILTER HEATERS 0E101A 0E103A 0E104A SCHEME NO 0V1350 DIVISION I	16	12/09/92
E-242 SH. 4	D 107391 SH. 4	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE HEATING SYSTEM STANDBY GAS TREATMENT SYSTEM VENT HEATERS 0E144A 0E144B	4	06/09/82
E-242 SH. 5	D 107391 SH. 5	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE HEATING SYSTEM STANDBY GAS TREATMENT SYSTEM VENT HEATERS 0E145A1 0E145A2 0E145B1 0E145B2	4	04/17/90
E-242 SH. 6	D 107391 SH. 6	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE HEATING SYSTEM CONTROL ROOM HEATERS 0E147	3	08/23/90
E-242 SH. 7	D 107391 SH. 7	SCHEMATIC DIAGRAM HVAC CONTROL STRUCTURE HEATING SYSTEM CONTROL ROOM HEATER 0E149	6	06/09/82
E-25 SH. 1	E 107174 SH. 1	SCHEMATIC METER & RELAY DIAGRAM INSTRUMENTATION AC POWER SUPPLY PANELS 1Y216 1Y226 1Y236 1Y246 1Y218 1Y128 SCHEME NOS 1Y0001 1Y0002 1Y0003 1Y0004 1Y0005 1Y0006	27	08/23/95
E-25 SH. 2	E 107174 SH. 2	SCHEMATIC METER & RELAY DIAGRAM INSTRUMENTATION AC POWER SUPPLY PANELS 2Y216 2Y226 2Y236 2Y246 2Y218 2Y128 SCHEME NOS 2Y0001 2Y0003 2Y0005 2Y0002 2Y0004 2Y0006	28	10/31/94
E-26 SH. 1	E 107175 SH. 1	SCHEMATIC METER & RELAY DIAGRAM 125V 250V DC SYSTEM	30	10/26/93
E-26 SH. 2	E 107175 SH. 2	SCHEMATIC METER & RELAY DIAGRAM 125V DC DISTRIBUTION PANELS ENGINEERED SAFEGUARD SYSTEM 1D614 1D624 1D634 1D644	18	10/26/93
E-26 SH. 3	E 107175 SH. 3	SCHEMATIC METER & RELAY DIAGRAM 125V DC DISTRIBUTION PANELS 1D615 1D625 1D635 1D645	22	01/29/96
E-26 SH. 4	E 107175 SH. 4	SCHEMATIC METER & RELAY DIAGRAM 125V DC DISTRIBUTION PANELS ENGINEERING SAFEGUARD SYSTEM 2D614 2D624 2D634 2D644	21	05/19/94
E-26 SH. 5	E 107175 SH. 5	SCHEMATIC METER & RELAY DIAGRAM 125V DC DISTRIBUTION PANELS 2D615 2D625 2D635 2D645	23	10/21/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-27 SH. 1	E 107176 SH. 1	SCHEMATIC METER & RELAY DIAGRAM PLUS OR MINUS 24V DC SYSTEM SCHEME 1D0101 1D0102 2D0101 2D0102	20	10/05/94
E-31 SH. 1	E 107180 SH. 1	LOGIC DIAGRAM ELECTRICAL SYSTEM 13.8KV FEEDER BREAKERS 52-10101 52-10104	5	08/09/84
E-31 SH. 2	E 107180 SH. 2	LOGIC DIAGRAM ELECTRICAL SYSTEM 13.8KV FEEDER BREAKERS 52-10301	4	04/16/91
E-31 SH. 3	E 107180 SH. 3	LOGIC DIAGRAM ELECTRICAL SYSTEM 13.8KV FEEDER BREAKER 52-10502	3	08/09/84
E-31 SH. 4	E 107180 SH. 4	LOGIC DIAGRAM ELECTRICAL SYSTEM 13.8KV FEEDER BREAKERS 52-10305 52-10309	2	09/13/82
E-31 SH. 5	E 107180 SH. 5	LOGIC DIAGRAM ELECTRICAL SYSTEM 4.16KV BUS INCOMING FEEDER BREAKER	11	11/08/94
E-31 SH. 6	E 107180 SH. 6	LOGIC DIAGRAM ELECTRICAL SYSTEM 480V LOAD CENTER MAIN & TIE BREAKER 52-10042	3	06/11/82
E-31 SH. 7	E 107180 SH. 7	LOGIC DIAGRAM ELECTRICAL SYSTEM 4.16KV ENGINEERED SAFEGUARD SYSTEM LOAD CENTER FEEDER & 480V MOTOR CONTROL CENTER SWING BUS BREAKER 52-20106	2	06/11/82
E-31 SH. 8	E 107180 SH. 8	LOGIC DIAGRAM ELECTRICAL SYSTEM 4.16KV DIESEL GENERATOR CIRCUIT BREAKER 52-20104	6	10/21/87
E-404 SH. 4	E 107553 SH. 4	UNDERGROUND CONDUIT & GROUNDING TRANSFORMER YARD AREA	25	10/17/95
E-404 SH. 5	E 107553 SH. 5	UNDERGROUND CONDUIT & GROUNDING TRANSFORMER YARD AREA	18	10/17/95
E-404 SH. 9	E 107553 SH. 9	RACEWAY LAYOUT MISC VALVE PITS SECTION A-A SPRAY POND VALVE PIT ELEVATION 678-0 MISC TANK AREA DEICING VALVE PIT DETAIL BYPASS VALVE VAULT & INSTRUMENTS FOR COOLING TOWERS	28	05/23/96
E-413 SH. 1	E 107562 SH. 1	PLOT PLAN MANHOLES & DUCT BANKS	32	10/17/95
E-47 SH. A	A 107196 SH.	JUNCTION BOX SCHEDULE & DETAILS	71	03/06/95

TABLE 1.7-1

AE Drawing/Sheet		PP&L Drawing/Sheet		Drawing Description	Revision	Issued
E-48	SH. A	A 107197	SH.	TERMINAL BOX SCHEDULE & DETAILS COVER SHEET	57	05/07/96
E-48	SH. 14	A 107197	SH. 14	TERMINAL BOX SCHEDULE & DETAILS	14	07/16/91
E-49	SH. A	A 107198	SH.	CONDUIT & CABLE TRAY NOTES & DETAILS	45	10/07/92
E-49	SH. 1	A 107198	SH. 1	CONDUIT & CABLE TRAY NOTES & DETAILS	4	08/11/78
E-5	SH. 1	E 107154	SH. 1	SINGLE LINE METER & RELAY DIAGRAM 4.16KV ENGINEERED SAFEGUARDS POWER SYSTEM SUPERSEDES E109-12 SHEET 25 E109-14 SHEET 26 E109-11 SHEET 25 & E109-13 SHEET 24	21	07/18/95
E-5	SH. 2	E 107154	SH. 2	SINGLE LINE METER & RELAY DIAGRAM 4.16KV ENGINEERED SAFEGUARDS POWER SYSTEM SUPERSEDES E109-16 SHEET 27 E109-18 SHEET 25 E109-17 SHEET 24 E109-19 SHEET 24	21	09/15/94
E-5	SH. 3	E 107154	SH. 3	SINGLE LINE METER & RELAY DIAGRAM MAKEUP WATER INTAKE STRUCTURE POWER SYSTEM SUPERSEDES E109-15 SHEET 25	7	06/18/82
E-5	SH. 4	E 107154	SH. 4	SINGLE LINE METER & RELAY DIAGRAM 4.16KV DIESEL GENERATOR	14	08/21/95
E-5	SH. 5	E 107154	SH. 5	SINGLE LINE METER & RELAY DIAGRAM 4.16KV DIESEL GENERATOR E BLDG K GHD 1706 GH/EDG 1563 AS BUILT FOR SYSTEM 003 005 024	12	06/10/93
E-51	SH. 82	A 107200	SH. 82	TRANSFORMER LIGHTING & DISTRIBUTION PANEL SCHEDULE 1LP21C	7	09/28/89
E-52	SH. A	A 107201	SH.	MANHOLE SCHEDULE NOTES & DETAILS	37	04/20/95
E-52	SH. 1	A 107201	SH. 1	MANHOLE SCHEDULE NOTES & DETAILS	3	08/31/78
E-53	SH. A	A 107202	SH.	SEISMIC CLASS 1 RACEWAY SUPPORTS NOTES & DETAILS	32	10/25/83
E-53	SH. 1	A 107202	SH. 1	SEISMIC CLASS I CABLE TRAY & CONDUIT SUPPORTS NOTES & DETAILS	12	11/16/79

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-59 SH. A	A 107208 SH.	FACING SHEET CABLE & WIRE INSTALLATION PROCEDURES	24	11/08/91
E-59 SH. 1	A 107208 SH. 1	CABLE & WIRE INSTALLATION PROCEDURES	7	10/25/83
E-60 SH. A	A 107209 SH.	FACING SHEET ELECTRICAL SEPARATION DESCRIPTION	12	09/18/87
E-60 SH. 6	A 107209 SH. 6	ELECTRICAL SEPARATION DESCRIPTION	4	02/18/80
E-71 SH. 1	A 107220 SH. 1	RACEWAY SCHEDULE 13.8KV & 4.16KV SYSTEM	22	05/03/84
E-73 SH. 1	A 107222 SH. 1	RACEWAY SCHEDULE LOW LEVEL INSTRUMENTATION	64	11/06/85
E-74 SH. 1	A 107223 SH. 1	RACEWAY SCHEDULE REACTOR PROTECTION SYSTEM & ENGINEERED SAFEGUARD SYSTEM 480V POWER & CONTROL	62	08/02/84
E-75 SH. 1	A 107224 SH. 1	RACEWAY SCHEDULE 13.8KV & 4.16KV SYSTEMS COMPLETE DOCUMENT SHOT ON 16MM ROLL G844 FRAME 1878	12	07/07/83
E-77 SH. 1	A 107226 SH. 1	RACEWAY SCHEDULE LOW LEVEL INSTRUMENTATION COMPLETE DOCUMENT SHOT ON ROLL G1149 FRAME 0247	49	01/03/85
E-78 SH. 1	A 107227 SH. 1	RACEWAY SCHEDULE REACTOR PROTECTION SYSTEM & ENGINEERED SAFEGUARD SYSTEM 480V POWER & CONTROL	53	05/29/84
E-8 SH. 4	E 107157 SH. 4	SINGLE LINE METER & RELAY DIAGRAM 480V LOAD CENTERS 1B210A 1B220B 1B230C 1B240D	16	03/02/90
E-8 SH. 8	E 107157 SH. 8	SINGLE LINE METER & RELAY DIAGRAM 480V LOAD CENTERS 2B210A 2B220B 2B230C 2B240D	16	03/02/90
E-81 SH. 1	A 107230 SH. 1	CIRCUIT SCHEDULE 13.8KV & 4.16KV SYSTEM	21	05/03/84
E-83 SH. 1	A 107232 SH. 1	CIRCUIT SCHEDULE LOW LEVEL INSTRUMENTATION COMPLETE SUPERSEDES B1E-300 SHEET A PER DCN 10	59	11/06/85

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-84 SH. 1	A 107233 SH. 1	CIRCUIT SCHEDULE REACTOR PROTECTION SYSTEM & ENGINEERED SAFEGUARD SYSTEM 480V POWER & CONTROL	56	08/02/84
E-85 SH. 1	A 107234 SH. 1	CIRCUIT SCHEDULE 13.8KV & 4.16KV SYSTEM	9	07/07/83
E-87 SH. 1	A 107236 SH. 1	CIRCUIT SCHEDULE LOW LEVEL INSTRUMENTATION COMPLETE DOCUMENT SHOT ON ROLL G1149 FRAME 0248	43	01/03/85
E-88 SH. 1	A 107237 SH. 1	CIRCUIT SCHEDULE REACTOR PROTECTIVE SYSTEM & ENGINEERED SAFEGUARD SYSTEM 480V POWER & CONTROL	49	05/29/84
E-9 SH. 9	E 107158 SH. 9	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B237	15	01/11/94
E-9 SH. 10	E 107158 SH. 10	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B247	13	02/24/90
E-9 SH. 11	E 107158 SH. 11	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B216	19	02/09/95
E-9 SH. 12	E 107158 SH. 12	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B226	18	02/09/95
E-9 SH. 19	E 107158 SH. 19	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B236I	18	08/15/95
E-9 SH. 20	E 107158 SH. 20	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B246 DIVISION II AREA 28 ELEVATION 719-1	21	12/23/92
E-9 SH. 36	E 107158 SH. 36	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B217 DIVISION 1 2B227 DIVISION II	22	05/04/95
E-9 SH. 37	E 107158 SH. 37	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B136	8	05/24/90
E-9 SH. 38	E 107158 SH. 38	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B146	10	05/24/90
E-9 SH. 39	E 107158 SH. 39	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B516A	16	10/31/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-9 SH. 40	E 107158 SH. 40	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B517 DIVISION I & 0B527 DIVISION II	13	09/27/89
E-9 SH. 41	E 107158 SH. 41	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B526B	16	02/26/92
E-9 SH. 43	E 107158 SH. 43	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B536C	15	10/28/92
E-9 SH. 44	E 107158 SH. 44	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B546D	15	06/12/92
E-9 SH. 45	E 107158 SH. 45	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 1B217 1B227	23	07/18/95
E-9 SH. 52	E 107158 SH. 52	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B237 DIVISION I	15	06/02/94
E-9 SH. 53	E 107158 SH. 53	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B247	5	12/09/92
E-9 SH. 54	E 107158 SH. 54	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTERS 1B219 DIVISION I & 1B229 DIVISION II	8	05/22/92
E-9 SH. 55	E 107158 SH. 55	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTERS 2B219 DIVISION I & 2B229 DIVISION II	8	12/09/92
E-9 SH. 57	E 107158 SH. 57	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B101	18	10/12/95
E-9 SH. 66	E 107158 SH. 66	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B216 DIVISION I	16	10/09/95
E-9 SH 67	E 107158 SH 67	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B226 DIVISION II	20	10/09/95
E-9 SH. 68	E 107158 SH. 68	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B252 & 2B262	11	11/29/95
E-9 SH. 70	E 107158 SH. 70	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B236 DIVISION I	19	06/08/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
E-9 SH. 71	E 107158 SH. 71	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 2B246 DIVISION II	16	04/16/91
E-9 SH. 77	E 107158 SH. 77	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B565 DIESEL GENERATOR E BLDG K GHD 1706 GH/EDG 1563 AS BUILT FOR SYSTEM 005 002 024 023 054 007 028A 028B SCHEME NO 0Y0306	13	06/10/93
E-9 SH. 78	E 107158 SH. 78	SINGLE LINE METER & RELAY DIAGRAM 480V MOTOR CONTROL CENTER 0B566 DIESEL GENERATOR E BLDG K GHD 1706 GH/EDG 1563 AS BUILT FOR SYSTEM 003 005 002 024 024B 020 085 099O 007 028B	12	07/16/91
J-109 SH. 2	B 103399 SH. 2	LOGIC DIAGRAM TURBINE BLDG CLOSED COOLING WATER HEAT EXCHANGER EMERGENCY SERVICE WATER TRANSFER	8	01/20/88
J-110 SH. 2	B 103400 SH. 2	LOGIC DIAGRAM SERVICE WATER SYSTEM REACTOR BLDG CLOSED COOLING WATER HEAT EXCHANGERS TRANSFER VALVES	8	01/20/88
J-111 SH. 2	B 103401 SH. 2	LOGIC DIAGRAM EMERGENCY SERVICE WATER SYSTEM LOOP A EMERGENCY SERVICE WATER PUMPS	16	10/20/93
J-111 SH. 3	B 103401 SH. 3	EMERGENCY SERVICE WATER SYSTEM PUMP ALARMS	12	03/06/90
J-111 SH. 4	B 103401 SH. 4	LOGIC DIAGRAM DIESEL GENERATOR A EMERGENCY SERVICE WATER LOOP A HEAT EXCHANGER VALVES	9	03/06/90
J-111 SH. 5	B 103401 SH. 5	LOGIC DIAGRAM DIESEL GENERATOR A EMERGENCY SERVICE WATER LOOP B HEAT EXCHANGER VALVES	8	03/06/90
J-111 SH. 6	B 103401 SH. 6	LOGIC DIAGRAM EMERGENCY SERVICE WATER INLET VALVE TO TURBINE BLDG CLOSED COOLING WATER HEAT EXCHANGER	5	07/30/82
J-111 SH. 11	B 103401 SH. 11	INSTRUMENTATION & CONTROL DIAGRAM DIESEL GENERATOR E EMERGENCY SERVICE WATER SYSTEM	6	03/06/90
J-111 SH. 13	B 103401 SH. 13	LOGIC DIAGRAM DIESEL GENERATOR E EMERGENCY SERVICE WATER HEAT EXCHANGER VALVES LOOP A	4	03/06/90
J-111 SH. 14A	B 103401 SH. 14	LOGIC DIAGRAM DIESEL GENERATOR E EMERGENCY SERVICE WATER HEAT EXCHANGER VALVES LOOP A & B ALARMS & TRIPS	4	03/06/90
J-112 SH. 2	B 103402 SH. 2	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM RESIDUAL HEAT REMOVAL SWITCH PUMP 1P506B	8	10/09/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
J-112 SH. 3	B 103402 SH. 3	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM 1E205A HEAT EXCHANGER INLET VALVE	4	02/24/89
J-112 SH. 4	B 103402 SH. 4	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM 1E205A HEAT EXCHANGER OUTLET VALVE	5	02/24/89
J-112 SH. 5	B 103402 SH. 5	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM 1E205B HEAT EXCHANGER INLET VALVE	5	06/23/89
J-112 SH. 6	B 103402 SH. 6	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM 1E205B HEAT EXCHANGER OUTLET VALVE	7	06/23/89
J-112 SH. 7	B 103402 SH. 7	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM SPRAY POND BYPASS VALVES	9	11/01/90
J-112 SH. 8	B 103402 SH. 8	LOGIC DIAGRAM RESIDUAL HEAT REMOVAL SERVICE WATER SYSTEM SPRAY POND HEADER VALVES	7	11/30/90
J-113 SH. 4	B 103403 SH. 4	LOGIC DIAGRAM REACTOR BLDG CLOSED COOLING WATER CONTAINMENT ISOLATION VALVES	10	10/13/83
J-120 SH. 2	B 103410 SH. 2	LOGIC DIAGRAM DIESEL OIL STORAGE & TRANSFER DIESEL GENERATOR DIESEL OIL TRANSFER PUMPS	4	11/28/84
J-120 SH. 4	B 103410 SH. 4	INSTRUMENTATION & CONTROL DIAGRAM DIESEL GENERATOR E BLDG DIESEL OIL STORAGE & TRANSFER SYSTEM CHANNEL NO 02020 02021 K GHD 1569 GH/EDG 1532 AS BUILT FOR SYSTEM 023	3	07/19/86
J-120 SH. 5	B 103410 SH. 5	LOGIC DIAGRAM DIESEL GENERATOR E BLDG DIESEL OIL TRANSFER PUMP 0P514E CHANNEL NO 02020 02021 K GHD 1569 GH/EDG 1532 AS BUILT FOR SYSTEM 023 023B	3	07/19/86
J-126 SH. 2	B 103416 SH. 2	LOGIC DIAGRAM CONTAINMENT INSTRUMENT GAS CONTAINMENT ISOLATION SOLENOID VALVES	3	07/20/82
J-126 SH. 3	B 103416 SH. 3	LOGIC DIAGRAM CONTAINMENT INSTRUMENT GAS COMPRESSOR SUCTION ISOLATION VALVE	5	05/04/83
J-126 SH. 4	B 103416 SH. 4	LOGIC DIAGRAM CONTAINMENT INSTRUMENT GAS CONTAINMENT ISOLATION SOLENOID VALVES	2	05/04/83
J-126 SH. 5	B 103416 SH. 5	LOGIC DIAGRAM CONTAINMENT INSTRUMENT GAS CONTAINMENT ISOLATION SOLENOID VALVES	1	07/20/82

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
J-126 SH. 6	B 103416 SH. 6	LOGIC DIAGRAM CONTAINMENT INSTRUMENT GAS CONTAINMENT ISOLATION SOLENOID VALVES	1	07/20/82
J-157 SH. 2	B 103447 SH. 2	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL PROCESS ISOLATION VALVES	4	06/23/86
J-157 SH. 3	B 103447 SH. 3	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CONTROL ISOLATION PNEUMATIC VALVES	3	07/30/82
J-157 SH. 4	B 103447 SH. 4	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CONTROL ISOLATION MOTORIZED VALVES	2	07/30/82
J-157 SH. 5	B 103447 SH. 5	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL SUPPRESSION POOL WATER FILTER PUMP 1P229	2	07/30/82
J-157 SH. 6	B 103447 SH. 6	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL EXCESS FLOW CHECK VALVES	2	07/30/82
J-157 SH. 6A	B 103447 SH. 6	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL DIVISION I CHECK VALVE SCHEDULE	3	07/30/82
J-157 SH. 6B	B 103447 SH. 6	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL DIVISION II CHECK VALVE SCHEDULE	5	08/07/85
J-157 SH. 7	B 103447 SH. 7	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL CHECK VALVE ALARM INDICATOR MATRIX	2	07/30/82
J-157 SH. 8	B 103447 SH. 8	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL VACUUM RELIEF VALVES	3	05/08/90
J-157 SH. 9	B 103447 SH. 9	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL VACUUM BREAKER ALARM	2	07/30/82
J-157 SH. 10A	B 103447 SH. 10	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL ATMOSPHERE MONITORING SOLENOID VALVES	7	06/23/86
J-157 SH. 10B	B 103447 SH. 10	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL ATMOSPHERE MONITORING SOLENOID VALVES	6	05/17/91
J-157 SH. 11	B 103447 SH. 11	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL N2 MAKEUP & STANDBY GAS TREATMENT BYPASS VALVES	10	06/23/86

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
J-157 SH. 12	B 103447 SH. 12	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL STANDBY GAS TREATMENT SYSTEM ISOLATION VALVES	7	01/03/86
J-157 SH. 13	B 103447 SH. 13	LOGIC DIAGRAM CONTAINMENT ATMOSPHERIC CONTROL ISOLATION VALVE OVERRIDE ALARM	7	06/27/95
J-411 SH. 2	D 103523 SH. 2	LOOP DIAGRAM EMERGENCY SERVICE WATER LOOP A SUPPLY PRESSURE & FLOW	11	03/06/90
J-411 SH. 3	D 103523 SH. 3	LOOP DIAGRAM EMERGENCY SERVICE WATER LOOP B SUPPLY PRESSURE & FLOW	10	01/03/89
J-411 SH. 4	D 103523 SH. 4	LOOP DIAGRAM P&ID M111 EMERGENCY SERVICE WATER DIESEL COOLER DISCHARGE TEMPERATURES SCHEME NO 0I1103	6	09/28/87
J-411 SH. 4A	D 103523 SH. 4	LOOP DIAGRAM EMERGENCY SERVICE WATER DIESEL COOLER DISCHARGE TEMPERATURE TRANSFER CONTROL DIESEL GENERATOR E NO 0I1110 GHD 1076 GH/EDG 1205	2	11/03/87
J-420 SH. 2	D 103532 SH. 2	LOOP DIAGRAM P&ID M-120 DIESEL OIL STORAGE TANK LEVEL PRESSURE SCHEME 0I2002	10	01/12/93
J-420 SH. 3	D 103532 SH. 3	LOOP DIAGRAM DIESEL GENERATOR E BLDG FUEL OIL DAY TANK STORAGE TANK LEVEL AREA 81 GHD 1315 GH/EDG 1352 AS BUILT FOR SYSTEM 023A	3	12/16/94
J-457 SH. 2	D 103506 SH. 2	LOOP DIAGRAM SUPPRESSION POOL LEVEL RECORDING I SCHEME 1I5701 & COMPUTER INPUT SCHEME 1I5703	14	06/09/94
J-457 SH. 2A	D 103506 SH. 2	LOOP DIAGRAM SUPPRESSION POOL LEVEL COMPUTER INPUT SCHEME 1I5704 & RECORDING II SCHEME 1I5702	15	10/31/90
J-457 SH. 3	D 103506 SH. 3	LOOP DIAGRAM CONTAINMENT & SUPPRESSION CHAMBER PRESSURES SCHEME NOS 1I5705 1I5707	20	10/09/95
J-457 SH. 3A	D 103506 SH. 3	LOOP DIAGRAM CONTAINMENT & SUPPRESSION CHAMBER PRESSURES	13	06/09/94
J-457 SH. 5	D 103506 SH. 5	LOOP DIAGRAM P&ID M-157 CONTAINMENT ATMOSPHERE TEMPERATURES LOOP A	11	01/30/91
J-457 SH. 6	D 103506 SH. 6	LOOP DIAGRAM P&ID M-157 SUPPRESSION CHAMBER TEMPERATURES LOOP B	11	01/30/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
J-457 SH. 7	D 103506 SH. 7	LOOP DIAGRAM CONTAINMENT ATMOSPHERE TEMPERATURES	14	10/09/95
J-457 SH. 7A	D 103506 SH. 7	LOOP DIAGRAM CONTAINMENT ATMOSPHERE TEMPERATURES	12	01/30/91
J-498 SH. 2	D 103779 SH. 2	LOOP DIAGRAM REMOTE SHUTDOWN INSTRUMENTATION DIVISION I SCHEME 1I9801	13	04/13/94
J-498 SH. 3	D 103779 SH. 3	LOOP DIAGRAM REMOTE SHUTDOWN INSTRUMENTATION DIVISION I SCHEME NO 1S1729	8	08/02/89
J-498 SH. 4	D 103779 SH. 4	LOOP DIAGRAM REMOTE SHUTDOWN INSTRUMENTATION DIVISION II SCHEME 1I9803	14	03/23/94
J-498 SH. 5	D 103779 SH. 5	LOOP DIAGRAM REMOTE SHUTDOWN INSTRUMENTATION DIVISION II SCHEME 1I9804	8	02/06/86
M1-B21-101 SH. 1	FF114511 SH. 101	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(1)	19	05/23/94
M1-B21-101 SH. 2	FF114511 SH. 102	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(2) PER BLP 29186	13	05/23/94
M1-B21-101 SH. 3	FF114511 SH. 103	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(3) PER BLP 29186	7	08/29/83
M1-B21-101 SH. 4	FF114511 SH. 104	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(4) PER BLP 29186	22	03/05/96
M1-B21-101 SH. 5	FF114511 SH. 105	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(5) PER BLP 29186	8	03/13/92
M1-B21-101 SH. 6	FF114511 SH. 106	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(6) PER BLP 29186	18	05/23/94
M1-B21-101 SH. 7	FF114511 SH. 107	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(7) PER BLP 29186	23	05/23/94
M1-B21-101 SH. 8	FF114511 SH. 108	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(8)	24	10/29/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-B21-101 SH. 9	FF114511 SH. 109	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(9) PER BLP 29186	21	06/08/94
M1-B21-101 SH. 10	FF114511 SH. 110	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(10) PER BLP 29186	24	12/01/94
M1-B21-101 SH. 11	FF114511 SH. 111	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(11) PER BLP 29186	17	09/13/91
M1-B21-101 SH. 12	FF114511 SH. 112	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(12) PER BLP 29186	20	06/08/94
M1-B21-101 SH. 13	FF114511 SH. 113	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(13) PER BLP 29186	18	07/10/87
M1-B21-101 SH. 14	FF114511 SH. 114	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(14) PER BLP 29186	17	01/25/90
M1-B21-101 SH. 15	FF114511 SH. 115	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(15) PER BLP 29186	13	11/05/86
M1-B21-101 SH. 16	FF114511 SH. 116	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(16) PER BLP 29186	17	06/08/94
M1-B21-101 SH. 17	FF114511 SH. 117	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-B21-127(17) PER BLP 29186	21	05/23/94
M1-B21-102 SH. 1	FF114511 SH. 201	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM 236X350AE	18	05/02/91
M1-B21-102 SH. 2	FF114511 SH. 202	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	16	06/12/92
M1-B21-102 SH. 4	FF114511 SH. 204	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	17	10/29/92
M1-B21-102 SH. 5	FF114511 SH. 205	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	8	11/05/86
M1-B21-102 SH. 6	FF114511 SH. 206	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	8	11/05/86

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-B21-102 SH. 7	FF114511 SH. 207	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	11	12/02/94
M1-B21-102 SH. 8	FF114511 SH. 208	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	10	07/13/94
M1-B21-102 SH. 9	FF114511 SH. 209	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	15	11/19/91
M1-B21-128 SH. 1	FF114511 SH. 2801	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION GE FINAL SUBMITTAL NO M1-B21-128(J)-1	11	06/06/88
M1-B21-128 SH. 2	FF114511 SH. 2802	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION PANELS 1C651 1C007 1C614 SCHEME NO 1Q1603	12	06/12/92
M1-B21-128 SH. 3	FF114511 SH. 2803	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION SCHEME NO 1Q1604 & 1Q1603	8	06/06/88
M1-B21-128 SH. 4	FF114511 SH. 2804	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION	10	06/06/85
M1-B21-128 SH. 5	FF114511 SH. 2805	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION FEDWATER INLET CHECK VALVES B21F074B HVB211F074B B21F074A HVB211F074A	8	06/06/88
M1-B21-129 SH. 1	FF114511 SH. 2901	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM GE FINAL SUBMITTAL NO M1-B21-129(E)-1	12	01/24/91
M1-B21-129 SH. 2	FF114511 SH. 2902	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	10	06/12/92
M1-B21-129 SH. 3	FF114511 SH. 2903	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	10	05/17/91
M1-B21-129 SH. 4	FF114511 SH. 2904	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	6	10/17/86
M1-B21-129 SH. 5	FF114511 SH. 2905	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	6	10/17/86
M1-B21-129 SH. 6	FF114511 SH. 2906	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	7	12/05/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-B21-129 SH. 7	FF114511 SH. 2907	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	5	12/05/94
M1-B21-129 SH. 8	FF114511 SH. 2908	ELEMENTARY DIAGRAM AUTOMATIC DEPRESSURIZATION SYSTEM	9	06/27/88
M1-B21-131 SH. 1	FF114511 SH. 3101	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	15	01/28/94
M1-B21-131 SH. 2	FF114511 SH. 3102	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	7	01/28/94
M1-B21-131 SH. 3	FF114511 SH. 3103	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	5	11/01/83
M1-B21-131 SH. 4	FF114511 SH. 3104	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	12	09/26/89
M1-B21-131 SH. 5	FF114511 SH. 3105	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	4	01/06/87
M1-B21-131 SH. 6	FF114511 SH. 3106	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	10	01/28/94
M1-B21-131 SH. 7	FF114511 SH. 3107	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	18	01/28/94
M1-B21-131 SH. 8	FF114511 SH. 3108	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	17	04/12/94
M1-B21-131 SH. 9	FF114511 SH. 3109	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	17	06/08/94
M1-B21-131 SH. 10	FF114511 SH. 3110	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	20	03/27/95
M1-B21-131 SH. 11	FF114511 SH. 3111	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	12	01/18/91
M1-B21-131 SH. 12	FF114511 SH. 3112	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	13	01/04/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-B21-131 SH. 13	FF114511 SH. 3113	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	12	07/10/87
M1-B21-131 SH. 14	FF114511 SH. 3114	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	11	09/28/89
M1-B21-131 SH. 15	FF114511 SH. 3115	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	8	05/14/86
M1-B21-131 SH. 16	FF114511 SH. 3116	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM	13	01/04/94
M1-B21-131 SH. 17	FF114511 SH. 3117	ELEMENTARY DIAGRAM NUCLEAR STEAM SUPPLY SHUTOFF SYSTEM SUPERSEDES M1-C12-110(36)	16	04/11/94
M1-B21-94 SH. 1	FF114510 SH. 9401	ELEMENTARY DIAGRAM JET PUMP INSTRUMENTATION SYSTEM GE FINAL SUBMITTAL NO M1-B21-94(B)-1	15	06/25/92
M1-B21-94 SH. 2	FF114510 SH. 9402	ELEMENTARY DIAGRAM JET PUMP INSTRUMENTATION SYSTEM	10	12/17/87
M1-B21-94 SH. 3	FF114510 SH. 9403	ELEMENTARY DIAGRAM JET PUMP INSTRUMENTATION SYSTEM	6	12/17/87
M1-B21-96 SH. 1	FF114510 SH. 9601	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION	15	06/06/88
M1-B21-96 SH. 2	FF114510 SH. 9602	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION	13	11/10/92
M1-B21-96 SH. 3	FF114510 SH. 9603	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION	15	06/06/88
M1-B21-96 SH. 4	FF114510 SH. 9604	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION	11	06/30/83
M1-B21-96 SH. 5	FF114510 SH. 9605	ELEMENTARY DIAGRAM NUCLEAR BOILER PROCESS INSTRUMENTATION	12	06/06/88
M1-B21-98 SH. 1	FF114510 SH. 9801	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	13	09/11/89

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-B21-98 SH. 2	FF114510 SH. 9802	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	17	10/12/94
M1-B21-98 SH. 3	FF114510 SH. 9803	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	15	05/23/96
M1-B21-98 SH. 4	FF114510 SH. 9804	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	10	06/17/88
M1-B21-98 SH. 5	FF114510 SH. 9805	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	7	06/17/88
M1-B21-98 SH. 6	FF114510 SH. 9806	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	9	06/17/88
M1-B21-98 SH. 7	FF114510 SH. 9807	ELEMENTARY DIAGRAM STEAM LEAK DETECTION SYSTEM	17	01/16/92
M1-B31-178 SH. 1	FF116511 SH. 7801	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	14	02/23/93
M1-B31-178 SH. 2	FF116511 SH. 7802	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	7	02/23/88
M1-B31-178 SH. 3	FF116511 SH. 7803	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	8	01/09/87
M1-B31-178 SH. 4	FF116511 SH. 7804	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	8	05/05/89
M1-B31-178 SH. 5	FF116511 SH. 7805	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	16	08/25/92
M1-B31-178 SH. 6	FF116511 SH. 7806	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	7	11/19/91
M1-B31-178 SH. 7	FF116511 SH. 7807	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	17	08/25/92
M1-B31-178 SH. 8	FF116511 SH. 7808	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	12	08/19/88

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-B31-178 SH. 9	FF116511 SH. 7809	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	11	02/23/93
M1-B31-178 SH. 10	FF116511 SH. 7810	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	10	02/23/93
M1-B31-178 SH. 11	FF116511 SH. 7811	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	14	10/29/92
M1-B31-178 SH. 12	FF116511 SH. 7812	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	10	10/29/92
M1-B31-178 SH. 13	FF116511 SH. 7813	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	15	05/16/96
M1-B31-178 SH. 14	FF116511 SH. 7814	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	12	04/29/94
M1-B31-178 SH. 15	FF116511 SH. 7815	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	8	09/19/83
M1-B31-178 SH. 16	FF116511 SH. 7816	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	10	04/29/94
M1-B31-178 SH. 17	FF116511 SH. 7817	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	16	02/23/88
M1-B31-178 SH. 18	FF116511 SH. 7818	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	13	04/29/96
M1-B31-178 SH. 19	FF116511 SH. 7819	ELEMENTARY DIAGRAM REACTOR RECIRCULATION PUMP & MOTOR GENERATOR SET	12	06/12/96
M1-C12-108 SH. 1	FF118251 SH. 801	ELEMENTARY DIAGRAM CONTROL ROD DRIVE HYDRAULIC SYSTEM GE FINAL SUBMITTAL NO M1-C12-108(K)-1	18	08/15/91
M1-C12-108 SH. 2	FF118251 SH. 802	ELEMENTARY DIAGRAM CONTROL ROD DRIVE HYDRAULIC SYSTEM	16	08/15/91
M1-C12-110 SH. 1	FF118251 SH. 1001	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	13	08/11/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C12-110 SH. 2	FF118251 SH. 1002	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM CABLE BLOCK DIAGRAM	6	09/20/83
M1-C12-110 SH. 3	FF118251 SH. 1003	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM TABULATION FOR CABLE BLOCK DIAGRAM	8	09/27/83
M1-C12-110 SH. 4	FF118251 SH. 1004	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM BLOCK DIAGRAM	4	09/15/83
M1-C12-110 SH. 5	FF118251 SH. 1005	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	3	10/03/83
M1-C12-110 SH. 6	FF118251 SH. 1006	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	5	09/29/87
M1-C12-110 SH. 7	FF118251 SH. 1007	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM TIMING DIAGRAM	3	10/03/83
M1-C12-110 SH. 8	FF118251 SH. 1008	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM VARIABLE & DEFINITIONS	4	09/19/83
M1-C12-110 SH. 9	FF118251 SH. 1009	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ROD SEQUENCE CONTROL SYSTEM BLOCK DIAGRAM & POWER INPUTS	6	08/11/95
M1-C12-110 SH. 11	FF118251 SH. 1011	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM INPUTS ROD SELECT	5	09/15/83
M1-C12-110 SH. 12	FF118251 SH. 1012	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	5	09/27/83
M1-C12-110 SH. 14	FF118251 SH. 1014	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM MASTER CLOCK	2	10/03/83
M1-C12-110 SH. 16	FF118251 SH. 1016	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM INPUT ISOLATOR	7	04/04/86
M1-C12-110 SH. 17	FF118251 SH. 1017	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ACTIVITY CONTROL CARD	2	09/20/83
M1-C12-110 SH. 18	FF118251 SH. 1018	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ACTIVITY CONTROL CARD	2	10/03/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C12-110 SH. 19	FF118251 SH. 1019	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ROD MOTION TIMER FOR ACTIVITY CONTROL 1 & 2	2	09/15/83
M1-C12-110 SH. 20	FF118251 SH. 1020	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ANALYZER CARD	2	09/19/83
M1-C12-110 SH. 21	FF118251 SH. 1021	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM BRANCH JUNCTION MODULE LEFT	3	09/15/83
M1-C12-110 SH. 22	FF118251 SH. 1022	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	4	02/05/85
M1-C12-110 SH. 23	FF118251 SH. 1023	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	6	04/24/85
M1-C12-110 SH. 24	FF118251 SH. 1024	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM TRANSPONDER CARD	4	02/07/86
M1-C12-110 SH. 25	FF118251 SH. 1025	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ANALYZER CARD	2	09/15/83
M1-C12-110 SH. 26	FF118251 SH. 1026	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM OUTPUT ISOLATOR	6	07/10/91
M1-C12-110 SH. 27	FF118251 SH. 1027	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM RODWORTH MINIMIZER OPERATOR PANEL	4	09/15/83
M1-C12-110 SH. 28	FF118251 SH. 1028	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM OUTPUT TO COMPUTER ALARMS & INDICATORS	10	01/30/96
M1-C12-110 SH. 29	FF118251 SH. 1029	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ROD POSITION INFORMATION SYSTEM & SCRAM TIMING CONNECTIONS	8	08/30/91
M1-C12-110 SH. 31	FF118251 SH. 1031	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM FULL CORE DISPLAY	3	09/15/83
M1-C12-110 SH. 32	FF118251 SH. 1032	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM FAULT MAP CARD	2	09/15/83
M1-C12-110 SH. 35	FF118251 SH. 1035	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM SELF TEST CIRCUITS	3	09/15/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C12-88 SH. 1	FF118250 SH. 8801	ELEMENTARY DIAGRAM CONTROL ROD DRIVE HYDRAULIC SYSTEM	22	05/27/93
M1-C12-88 SH. 2	FF118250 SH. 8802	ELEMENTARY DIAGRAM CONTROL ROD DRIVE HYDRAULIC SYSTEM	20	05/27/93
M1-C12-90 SH. 1	FF118250 SH. 9001	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL FOR CONTROL ROD DRIVE SYSTEM	17	03/05/96
M1-C12-90 SH. 2	FF118250 SH. 9002	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM CABLE BLOCK DIAGRAM	14	03/05/96
M1-C12-90 SH. 3	FF118250 SH. 9003	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM TABULATION FOR CABLE BLOCK DIAGRAM	12	06/12/96
M1-C12-90 SH. 4	FF118250 SH. 9004	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM BLOCK DIAGRAM	7	07/06/83
M1-C12-90 SH. 5	FF118250 SH. 9005	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	6	07/06/83
M1-C12-90 SH. 6	FF118250 SH. 9006	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL FOR CONTROL ROD DRIVE SYSTEM	8	05/17/85
M1-C12-90 SH. 7	FF118250 SH. 9007	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM TIMING DIAGRAM	3	01/26/83
M1-C12-90 SH. 8	FF118250 SH. 9008	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM VARIABLES & DEFINITIONS	6	02/15/84
M1-C12-90 SH. 9	FF118250 SH. 9009	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ROD SEQUENCE CONTROL SYSTEM BLOCK DIAGRAM & POWER INPUTS	5	11/07/95
M1-C12-90 SH. 11	FF118250 SH. 9011	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL FOR CONTROL ROD DRIVE SYSTEM	13	06/12/96
M1-C12-90 SH. 12	FF118250 SH. 9012	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	5	07/14/83
M1-C12-90 SH. 14	FF118250 SH. 9014	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM MASTER CLOCK	6	07/14/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C12-90 SH. 15	FF118250 SH. 9015	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM INPUT ISOLATOR 2C616	13	11/07/95
M1-C12-90 SH. 16	FF118250 SH. 9016	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	14	03/05/96
M1-C12-90 SH. 17	FF118250 SH. 9017	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ACTIVITY CONTROL CARD 1	6	07/14/83
M1-C12-90 SH. 18	FF118250 SH. 9018	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ACTIVITY CONTROL CARD 2	6	07/14/83
M1-C12-90 SH. 19	FF118250 SH. 9019	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ROD MOTION TIMER FOR ACTIVITY CONTROL 1 & 2	6	07/14/83
M1-C12-90 SH. 20	FF118250 SH. 9020	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ANALYZER CARD	6	07/07/83
M1-C12-90 SH. 21	FF118250 SH. 9021	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM BRANCH JUNCTION MODULE LEFT	7	07/07/83
M1-C12-90 SH. 22	FF118250 SH. 9022	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM BRANCH JUNCTION MODULE RIGHT	8	05/17/85
M1-C12-90 SH. 23	FF118250 SH. 9023	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM HYDRAULIC CONTROL UNIT INTERCONNECTIONS & CORE PATTERN	9	06/07/85
M1-C12-90 SH. 24	FF118250 SH. 9024	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM TRANSPONDER CARD	5	02/07/86
M1-C12-90 SH. 25	FF118250 SH. 9025	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM ANALYZER CARD	8	07/07/83
M1-C12-90 SH. 26	FF118250 SH. 9026	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM OUTPUT ISOLATOR	11	03/05/96
M1-C12-90 SH. 27	FF118250 SH. 9027	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM RODWORTH MINIMIZER OPERATION PANEL	8	07/07/83
M1-C12-90 SH. 28	FF118250 SH. 9028	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL FOR CONTROL ROD DRIVE SYSTEM	15	03/05/96

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C12-90 SH. 29	FF118250 SH. 9029	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM	14	03/05/96
M1-C12-90 SH. 30	FF118250 SH. 9030	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM DRIVE CONTROL SYSTEM OUTPUTS	7	07/07/83
M1-C12-90 SH. 31	FF118250 SH. 9031	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM FULL CORE DISPLAY	7	07/07/83
M1-C12-90 SH. 32	FF118250 SH. 9032	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM FAULT MAP CARD	4	07/07/83
M1-C12-90 SH. 35	FF118250 SH. 9035	ELEMENTARY DIAGRAM REACTOR MANUAL CONTROL SYSTEM SELF TEST CIRCUITS	4	07/07/83
M1-C32-17 SH. 1	FF120010 SH. 1701	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	17	02/23/93
M1-C32-17 SH. 2	FF120010 SH. 1702	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	12	06/27/88
M1-C32-17 SH. 3	FF120010 SH. 1703	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	15	07/03/95
M1-C32-17 SH. 4	FF120010 SH. 1704	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	10	06/27/88
M1-C32-17 SH. 5	FF120010 SH. 1705	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	10	06/27/88
M1-C32-17 SH. 6	FF120010 SH. 1706	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	10	06/27/88
M1-C32-6 SH. 1	FF120010 SH. 601	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM GE FINAL SUBMITTAL NO M1-C32-6(F)-1	17	06/27/88
M1-C32-6 SH. 2	FF120010 SH. 602	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	17	04/10/91
M1-C32-6 SH. 3	FF120010 SH. 603	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	21	02/23/95

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C32-6 SH. 4	FF120010 SH. 604	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	15	06/27/88
M1-C32-6 SH. 5	FF120010 SH. 605	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	19	06/27/88
M1-C32-6 SH. 6	FF120010 SH. 606	ELEMENTARY DIAGRAM FEEDWATER CONTROL SYSTEM	14	06/27/88
M1-C41-29 SH. 1	FF121010 SH. 2901	ELEMENTARY DIAGRAM STANDBY LIQUID CONTROL GE FINAL SUBMITTAL NO M1-C41-29(G)-1 POWER DISTRIBUTION PANELS 2C613 2C617	18	04/18/91
M1-C41-29 SH. 2	FF121010 SH. 2902	ELEMENTARY DIAGRAM STANDBY LIQUID CONTROL INJECTION VALVE C41F006 25 WATT 120V AC 60 CYCLE INSTRUMENT BUS A 2Y216	17	05/17/88
M1-C41-29 SH. 3	FF121010 SH. 2903	ELEMENTARY DIAGRAM STANDBY LIQUID CONTROL	16	05/06/94
M1-C41-36 SH. 1	FF121010 SH. 3601	ELEMENTARY DIAGRAM STANDBY LIQUID CONTROL SYSTEM POWER DISTRIBUTION PANELS 1C613 PC617	15	08/15/91
M1-C41-36 SH. 2	FF121010 SH. 3602	ELEMENTARY DIAGRAM STANDBY LIQUID CONTROL SYSTEM INJECTION VALVE C41F006	15	08/04/88
M1-C41-36 SH. 3	FF121010 SH. 3603	ELEMENTARY DIAGRAM STANDBY LIQUID CONTROL SYSTEM	13	05/06/94
M1-C51-17 SH. 1	FF122010 SH. 1701	ELEMENTARY DIAGRAM TRAVERSING INCORE PROBE CALIBRATION SYSTEM GE FINAL SUBMITTAL NO M1-C51-17(C)-1	10	06/24/85
M1-C51-17 SH. 2	FF122010 SH. 1702	ELEMENTARY DIAGRAM TRAVERSING INCORE PROBE CALIBRATION SYSTEM	6	09/13/83
M1-C51-17 SH. 3	FF122010 SH. 1703	ELEMENTARY DIAGRAM TRAVERSING INCORE PROBE CALIBRATION SYSTEM	7	09/12/83
M1-C51-17 SH. 4	FF122010 SH. 1704	ELEMENTARY DIAGRAM TRAVERSING INCORE PROBE CALIBRATION SYSTEM	7	06/24/85
M1-C51-17 SH. 5	FF122010 SH. 1705	ELEMENTARY DIAGRAM TRAVERSING INCORE PROBE CALIBRATION SYSTEM	7	06/24/85

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C51-18 SH. 1	FF122010 SH. 1801	ELEMENTARY DIAGRAM STARTUP RANGE DETECTOR DRIVE CONTROL SYSTEM GE FINAL SUBMITTAL NO M1-C51-18(A)-1	11	01/22/88
M1-C51-18 SH. 2	FF122010 SH. 1802	ELEMENTARY DIAGRAM STARTUP RANGE DETECTOR DRIVE CONTROL SYSTEM	11	04/12/88
M1-C51-18 SH. 3	FF122010 SH. 1803	ELEMENTARY DIAGRAM STARTUP RANGE DETECTOR DRIVE CONTROL SYSTEM	12	04/12/88
M1-C51-18 SH. 4	FF122010 SH. 1804	ELEMENTARY DIAGRAM STARTUP RANGE DETECTOR DRIVE CONTROL SYSTEM	9	04/12/88
M1-C51-18 SH. 5	FF122010 SH. 1805	ELEMENTARY DIAGRAM STARTUP RANGE DETECTOR CONTROL DRIVE SYSTEM	9	04/12/88
M1-C51-19 SH. 1	FF122010 SH. 1901	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS GE FINAL SUBMITTAL NO M1-C51-19(M)-1	16	09/27/83
M1-C51-19 SH. 2	FF122010 SH. 1902	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	3	09/20/83
M1-C51-19 SH. 3	FF122010 SH. 1903	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS 120V AC BUS A POWER DISTRIBUTION	7	05/09/86
M1-C51-19 SH. 4	FF122010 SH. 1904	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS 120V AC BUS B POWER DISTRIBUTION	5	10/03/83
M1-C51-19 SH. 5	FF122010 SH. 1905	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	9	09/27/83
M1-C51-19 SH. 6	FF122010 SH. 1906	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS DC POWER DISTRIBUTION BAY 1 PANEL P608 1C608	4	10/21/83
M1-C51-19 SH. 7	FF122010 SH. 1907	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS DC POWER DISTRIBUTION BAY 2 PANEL P608	6	10/24/83
M1-C51-19 SH. 8	FF122010 SH. 1908	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS DC POWER DISTRIBUTION BAY 3 PANEL P608	4	09/27/83
M1-C51-19 SH. 9	FF122010 SH. 1909	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS DC POWER DISTRIBUTION BAY 4 PANEL P608	6	09/27/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C51-19 SH. 10	FF122010 SH. 1910	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS DC POWER DISTRIBUTION BAY 5 PANEL P608	5	10/24/83
M1-C51-19 SH. 11	FF122010 SH. 1911	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR CHANNEL A	10	10/29/92
M1-C51-19 SH. 12	FF122010 SH. 1912	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	12	08/10/84
M1-C51-19 SH. 13	FF122010 SH. 1913	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR CHANNEL B	10	10/29/92
M1-C51-19 SH. 14	FF122010 SH. 1914	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	9	08/10/84
M1-C51-19 SH. 15	FF122010 SH. 1915	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR CHANNEL C	10	10/29/92
M1-C51-19 SH. 16	FF122010 SH. 1916	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	11	08/10/84
M1-C51-19 SH. 17	FF122010 SH. 1917	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR CHANNEL D	11	09/29/92
M1-C51-19 SH. 18	FF122010 SH. 1918	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	11	08/10/84
M1-C51-19 SH. 19	FF122010 SH. 1919	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	12	10/29/92
M1-C51-19 SH. 20	FF122010 SH. 1920	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	10	08/10/84
M1-C51-19 SH. 21	FF122010 SH. 1921	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR CHANNEL F	10	10/29/92
M1-C51-19 SH. 22	FF122010 SH. 1922	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	10	08/10/84
M1-C51-19 SH. 23	FF122010 SH. 1923	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR AUXILIARY RELAYS CHANNELS A C E	8	04/15/85

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C51-19 SH. 24	FF122010 SH. 1924	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR AUXILIARY RELAYS CHANNELS B D F	9	04/19/85
M1-C51-19 SH. 25	FF122010 SH. 1925	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR REMOTE INDICATORS	7	09/28/83
M1-C51-19 SH. 26	FF122010 SH. 1926	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS CALIBRATOR	3	11/09/83
M1-C51-19 SH. 27	FF122010 SH. 1927	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS LOW POWER RANGE MONITOR GROUP A	11	10/29/92
M1-C51-19 SH. 28	FF122010 SH. 1928	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS LOW POWER RANGE MONITOR GROUP B	10	10/29/92
M1-C51-19 SH. 29	FF122010 SH. 1929	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	9	09/27/83
M1-C51-19 SH. 30	FF122010 SH. 1930	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	3	09/29/83
M1-C51-19 SH. 31	FF122010 SH. 1931	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEM ROD BLOCK MONITOR CHANNEL A SELECTION MATRIX OUTPUT	9	10/24/83
M1-C51-19 SH. 32	FF122010 SH. 1932	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	10	09/29/83
M1-C51-19 SH. 33	FF122010 SH. 1933	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	11	10/03/83
M1-C51-19 SH. 34	FF122010 SH. 1934	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS ROD BLOCK MONITOR CHANNEL B SELECTION MATRIX INPUT	7	09/27/83
M1-C51-19 SH. 35	FF122010 SH. 1935	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS ROD BLOCK MONITOR CHANNEL B SELECTION MATRIX DETECTOR INPUT	3	10/03/83
M1-C51-19 SH. 36	FF122010 SH. 1936	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS ROD BLOCK MONITOR CHANNEL B SELECTION MATRIX OUTPUT	9	10/31/83
M1-C51-19 SH. 37	FF122010 SH. 1937	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	10	09/29/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C51-19 SH. 38	FF122010 SH. 1938	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	11	09/29/83
M1-C51-19 SH. 39	FF122010 SH. 1939	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS ROD BLOCK MONITOR BYPASS & AUXILIARY RELAYS	7	10/03/83
M1-C51-19 SH. 40	FF122010 SH. 1940	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	11	07/03/95
M1-C51-19 SH. 41	FF122010 SH. 1941	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR TRIP REFERENCE CHANNELS A C E	8	02/23/95
M1-C51-19 SH. 42	FF122010 SH. 1942	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS	12	07/03/95
M1-C51-19 SH. 43	FF122010 SH. 1943	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS AVERAGE POWER RANGE MONITOR TRIP REFERENCE CHANNELS B D F	7	02/23/95
M1-C51-19 SH. 44	FF122010 SH. 1944	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS COMPUTER ANALOG INPUTS	12	07/03/95
M1-C51-19 SH. 45	FF122010 SH. 1945	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS REACTOR PROTECTION SYSTEM OUTPUTS	8	06/03/83
M1-C51-19 SH. 46	FF122010 SH. 1946	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS REACTOR MANUAL CONTROL SYSTEM OUTPUTS	6	10/03/83
M1-C51-19 SH. 47	FF122010 SH. 1947	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS ANNUNCIATOR OUTPUTS CLOSE TO ALARM	11	07/13/94
M1-C51-19 SH. 48	FF122010 SH. 1948	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS DIGITAL COMPUTER INPUTS	10	05/04/95
M1-C51-19 SH. 49	FF122010 SH. 1949	ELEMENTARY DIAGRAM POWER RANGE NEUTRON MONITORING SYSTEMS CABLING DIAGRAM	12	03/04/85
M1-C51-20 SH. 1	FF122010 SH. 2001	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM GE 236X350AE	12	06/03/85
M1-C51-20 SH. 2	FF122010 SH. 2002	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM	2	09/14/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C51-20 SH. 3	FF122010 SH. 2003	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM	3	09/14/83
M1-C51-20 SH. 4	FF122010 SH. 2004	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM SOURCE RANGE MONITOR CHANNELS A B C D	11	08/25/92
M1-C51-20 SH. 5	FF122010 SH. 2005	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM SOURCE RANGE MONITOR CHANNELS A B C D AUXILIARY RELAYS REMOTE LIGHTS	8	10/03/83
M1-C51-20 SH. 6	FF122010 SH. 2006	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM INTERMEDIATE RANGE MONITOR CHANNELS A C E G	11	01/20/94
M1-C51-20 SH. 7	FF122010 SH. 2007	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM INTERMEDIATE RANGE MONITOR CHANNELS B D F H	10	09/27/83
M1-C51-20 SH. 8	FF122010 SH. 2008	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM INTERMEDIATE RANGE MONITOR CHANNELS A C E & G AUXILIARY RELAYS & REMOTE LIGHTS	9	10/03/83
M1-C51-20 SH. 9	FF122010 SH. 2009	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM INTERMEDIATE RANGE MONITOR CHANNELS B D F H AUXILIARY RELAYS & REMOTE LIGHTS	10	09/29/83
M1-C51-20 SH. 10	FF122010 SH. 2010	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM SOURCE & INTERMEDIATE RANGE MONITORS ANNUNCIATORS	8	09/29/83
M1-C51-20 SH. 11	FF122010 SH. 2011	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM COMPUTER INPUTS	8	05/04/95
M1-C51-20 SH. 12	FF122010 SH. 2012	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM REACTOR MANUAL CONTROL SYSTEM & REACTOR PROTECTION SYSTEM	8	10/03/83
M1-C51-20 SH. 13	FF122010 SH. 2013	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM DISPLAY CONTROL SYSTEM INPUTS	9	04/18/91
M1-C51-20 SH. 14	FF122010 SH. 2014	ELEMENTARY DIAGRAM STARTUP RANGE NEUTRON MONITORING SYSTEM CABLING DIAGRAM	8	09/19/83
M1-C72-22 SH. 1	FF122610 SH. 2201	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM TRIP CHANNEL A1 A2 B1 B2 SENSORS	14	03/21/94
M1-C72-22 SH. 2	FF122610 SH. 2202	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	6	06/25/85

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C72-22 SH. 3	FF122610 SH. 2203	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	7	09/14/84
M1-C72-22 SH. 4	FF122610 SH. 2204	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	16	06/25/96
M1-C72-22 SH. 5	FF122610 SH. 2205	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	6	10/03/83
M1-C72-22 SH. 6	FF122610 SH. 2206	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	13	04/05/94
M1-C72-22 SH. 7	FF122610 SH. 2207	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	15	12/05/94
M1-C72-22 SH. 8	FF122610 SH. 2208	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	14	04/05/94
M1-C72-22 SH. 9	FF122610 SH. 2209	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	13	04/05/94
M1-C72-22 SH. 10	FF122610 SH. 2210	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	5	09/14/84
M1-C72-22 SH. 11	FF122610 SH. 2211	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	8	05/21/93
M1-C72-22 SH. 12	FF122610 SH. 2212	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	12	06/25/96
M1-C72-22 SH. 13	FF122610 SH. 2213	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	10	12/28/87
M1-C72-22 SH. 14	FF122610 SH. 2214	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	9	11/06/86
M1-C72-22 SH. 15	FF122610 SH. 2215	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	10	06/03/85
M1-C72-22 SH. 16	FF122610 SH. 2216	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	6	06/03/85

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C72-22 SH. 17	FF122610 SH. 2217	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	7	11/06/86
M1-C72-22 SH. 18	FF122610 SH. 2218	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM 1C635 1C636	5	05/05/94
M1-C72-3 SH. 1	FF122610 SH. 301	REACTOR PROTECTION SYSTEM INTERCONNECTION SCHEME	5	04/05/83
M1-C72-3 SH. 2	FF122610 SH. 302	REACTOR PROTECTION SYSTEM INTERCONNECTION SCHEME	6	05/24/85
M1-C72-3 SH. 3	FF122610 SH. 303	REACTOR PROTECTION SYSTEM INTERCONNECTION SCHEME	5	04/05/83
M1-C72-4 SH. 1	FF122610 SH. 401	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM MOTOR GENERATOR SET CONTROL 236X350AE	15	10/29/92
M1-C72-5 SH. 1	FF122610 SH. 501	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM TRIP CHANNEL A1 A2 B1 B2 SENSORS SUPERSEDES M1-C72-16(1)-2 PER BLP 29186	21	03/21/94
M1-C72-5 SH. 2	FF122610 SH. 502	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM RELIEF VALVE AUGMENTED BYPASS SUPERSEDES M1-C72-16(2)-2 PER BLP 29186	7	08/09/83
M1-C72-5 SH. 3	FF122610 SH. 503	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(3)-2 PER BLP 29186	12	07/10/91
M1-C72-5 SH. 4	FF122610 SH. 504	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(4)-2 PER BLP 29186	20	06/12/92
M1-C72-5 SH. 5	FF122610 SH. 505	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(5)-2 PER BLP 29186	12	08/09/83
M1-C72-5 SH. 6	FF122610 SH. 506	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(6)-2 PER BLP 29186	17	09/20/94
M1-C72-5 SH. 7	FF122610 SH. 507	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(7)-2	18	09/20/94
M1-C72-5 SH. 8	FF122610 SH. 508	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(8)-2 PER BLP 29186	21	09/21/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-C72-5 SH. 9	FF122610 SH. 509	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(9)-2 PER BLP 29186	19	09/20/94
M1-C72-5 SH. 10	FF122610 SH. 510	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(10)-2 PER BLP 29186	9	08/09/83
M1-C72-5 SH. 11	FF122610 SH. 511	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(11) PER BLP 29186	15	05/19/93
M1-C72-5 SH. 12	FF122610 SH. 512	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(12) PER BLP 29186	16	07/14/88
M1-C72-5 SH. 13	FF122610 SH. 513	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(13)-2 PER BLP 29186	21	10/29/92
M1-C72-5 SH. 14	FF122610 SH. 514	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(14)-2 PER BLP 29186	15	10/29/92
M1-C72-5 SH. 16	FF122610 SH. 516	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SUPERSEDES M1-C72-16(16) PER BLP 29186	11	10/10/86
M1-C72-5 SH. 17	FF122610 SH. 517	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM	4	11/06/86
M1-C72-5 SH. 18	FF122610 SH. 518	ELEMENTARY DIAGRAM REACTOR PROTECTION SYSTEM SCRAM DISCHARGE VOLUME HIGH WATER LEVEL	8	05/17/88
M1-D12-2 SH. 1	FF123510 SH. 201	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM GE FINAL SUBMITTAL NO M1-D12-2(J)-1 SUPERSEDES M1-D12-7(1)-2 PER BLP 29186 FOR UNIT 1	19	06/12/92
M1-D12-2 SH. 2	FF123510 SH. 202	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(2) PER BLP 29186 FOR UNIT 1	17	09/13/91
M1-D12-2 SH. 3	FF123510 SH. 203	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(3)-2 PER BLP 29186	16	05/17/91
M1-D12-2 SH. 4	FF123510 SH. 204	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(4)-2 PER BLP 29186	12	03/25/88
M1-D12-2 SH. 5	FF123510 SH. 205	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(5)-2 FOR UNIT 1 PER BLP 29186	17	03/25/88

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-D12-2 SH. 6	FF123510 SH. 206	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(6)-2 FOR UNIT 1 PER BLP 29186	16	03/25/88
M1-D12-2 SH. 8	FF123510 SH. 208	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(8)-2 FOR UNIT 1 PER BLP 29186	15	03/25/88
M1-D12-2 SH. 9	FF123510 SH. 209	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(9)-2 FOR UNIT 1 PER BLP 29186	12	03/25/88
M1-D12-2 SH. 10	FF123510 SH. 210	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(10)-2 FOR UNIT 1 PER BLP 29186	12	03/25/88
M1-D12-2 SH. 11	FF123510 SH. 211	ELEMENTARY DIAGRAM PROCESS RADIATION MONITORING SYSTEM SUPERSEDES M1-D12-7(11)-2 FOR UNIT 1 PER BLP 29186	13	05/17/91
M1-D21-3 SH. 1	FF124250 SH. 301	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM GE FINAL SUBMITTAL NO M1-D21-3(F)-1	19	04/18/91
M1-D21-3 SH. 3	FF124250 SH. 303	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	11	05/18/88
M1-D21-3 SH. 4	FF124250 SH. 304	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	11	05/18/88
M1-D21-3 SH. 6	FF124250 SH. 306	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	10	05/18/88
M1-D21-3 SH. 7	FF124250 SH. 307	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	11	05/18/88
M1-D21-3 SH. 8	FF124250 SH. 308	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	14	05/18/88
M1-D21-3 SH. 9	FF124250 SH. 309	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	11	05/18/88
M1-D21-3 SH. 10	FF124250 SH. 310	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	13	05/18/88
M1-D21-3 SH. 11	FF124250 SH. 311	ELEMENTARY DIAGRAM AREA RADIATION MONITORING SYSTEM	3	05/18/88

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E11-29 SH. 1	FF124510 SH. 2901	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM PUMP VALVE & CONTROL TABULATION SUPERSEDES M1-E11-62 PER BLP 29186 GE FINAL SUBMITTAL NO M1-D11-29(S)-1 REFERENCE E-153(31)	24	11/13/92
M1-E11-29 SH. 2	FF124510 SH. 2902	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(2)-2 PER BLP 29186	9	08/30/88
M1-E11-29 SH. 3	FF124510 SH. 2903	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(3)	16	11/13/92
M1-E11-29 SH. 4	FF124510 SH. 2904	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(4) PER BLP 29186 SCHEME NO 2Q3058	23	03/05/93
M1-E11-29 SH. 5	FF124510 SH. 2905	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(5)-2	13	04/26/94
M1-E11-29 SH. 6	FF124510 SH. 2906	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(6)-2 PER BLP 29186	14	01/05/96
M1-E11-29 SH. 7	FF124510 SH. 2907	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(7)-2 PER BLP 29186	23	06/28/94
M1-E11-29 SH. 8	FF124510 SH. 2908	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(8)-2 PER BLP 29186	12	07/21/88
M1-E11-29 SH. 9	FF124510 SH. 2909	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(9)-2 PER BLP 29186	16	11/07/95
M1-E11-29 SH. 10	FF124510 SH. 2910	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(10)-2 PER BLP 29186	20	06/17/88
M1-E11-29 SH. 11	FF124510 SH. 2911	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(11)-2 PER BLP 29186	19	06/17/88
M1-E11-29 SH. 12	FF124510 SH. 2912	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(12) PER BLP 29186	18	04/16/91
M1-E11-29 SH. 13	FF124510 SH. 2913	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(13)-2 PER BLP 29186	15	04/26/94
M1-E11-29 SH. 14	FF124510 SH. 2914	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	21	11/13/92

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E11-29 SH. 15	FF124510 SH. 2915	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(15)-2 PER BLP 29186	12	07/16/91
M1-E11-29 SH. 16	FF124510 SH. 2916	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(16)-2 PER BLP 29186	16	07/16/91
M1-E11-29 SH. 17	FF124510 SH. 2917	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(17)-2 PER BLP 29186	16	10/13/89
M1-E11-29 SH. 18	FF124510 SH. 2918	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(18)-2 PER BLP 29186	13	07/16/91
M1-E11-29 SH. 19	FF124510 SH. 2919	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(19)-2 PER BLP 29186	15	10/13/89
M1-E11-29 SH. 20	FF124510 SH. 2920	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(20)-2 PER BLP 29186	14	12/14/83
M1-E11-29 SH. 23	FF124510 SH. 2923	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SUPERSEDES M1-E11-62(23) PER BLP 29186	12	07/16/91
M1-E11-66 SH. 1	FF124510 SH. 6601	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM 236X350AE	13	01/07/94
M1-E11-66 SH. 2	FF124510 SH. 6602	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	9	09/26/89
M1-E11-66 SH. 3	FF124510 SH. 6603	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	10	01/07/94
M1-E11-66 SH. 4	FF124510 SH. 6604	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	15	12/01/94
M1-E11-66 SH. 5	FF124510 SH. 6605	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	7	09/26/89
M1-E11-66 SH. 6	FF124510 SH. 6606	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	10	07/03/95
M1-E11-66 SH. 7	FF124510 SH. 6607	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	16	06/28/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E11-66 SH. 8	FF124510 SH. 6608	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	9	09/26/89
M1-E11-66 SH. 9	FF124510 SH. 6609	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	10	07/03/95
M1-E11-66 SH. 10	FF124510 SH. 6610	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	11	06/17/88
M1-E11-66 SH. 11	FF124510 SH. 6611	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	7	06/17/88
M1-E11-66 SH. 12	FF124510 SH. 6612	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	11	03/20/91
M1-E11-66 SH. 13	FF124510 SH. 6613	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	9	06/12/92
M1-E11-66 SH. 14	FF124510 SH. 6614	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	13	11/22/93
M1-E11-66 SH. 15	FF124510 SH. 6615	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	8	09/26/89
M1-E11-66 SH. 16	FF124510 SH. 6616	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	7	09/26/89
M1-E11-66 SH. 17	FF124510 SH. 6617	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	9	07/28/89
M1-E11-66 SH. 18	FF124510 SH. 6618	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	8	09/27/89
M1-E11-66 SH. 19	FF124510 SH. 6619	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SCHEME NOS 1Q3046 1Q3047 1Q3051 1Q3053 1Q3057 1Q3021 1Q3036 1Q3038 1Q3055	10	08/01/89
M1-E11-66 SH. 20	FF124510 SH. 6620	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	7	07/21/89
M1-E11-66 SH. 22	FF124510 SH. 6622	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM SCHEME NOS 1Q3081 1Q3082 1Q3085 1Q3086 1Q3087	11	07/28/89

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E11-66 SH. 23	FF124510 SH. 6623	ELEMENTARY DIAGRAM RESIDUAL HEAT REMOVAL SYSTEM	7	07/28/89
M1-E21-20 SH. 1	FF126510 SH. 2001	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33 PER DCN 10	16	02/15/90
M1-E21-20 SH. 2	FF126510 SH. 2002	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(2) PER DCN 10	21	06/08/94
M1-E21-20 SH. 3	FF126510 SH. 2003	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(3) PER DCN 10	23	06/09/94
M1-E21-20 SH. 4	FF126510 SH. 2004	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(4) PER DCN 10	26	06/08/94
M1-E21-20 SH. 5	FF126510 SH. 2005	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(5) PER DCN 10	19	02/15/90
M1-E21-20 SH. 6	FF126510 SH. 2006	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(6) PER DCN 10	19	02/15/90
M1-E21-20 SH. 7	FF126510 SH. 2007	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(7) PER DCN 10	21	06/15/94
M1-E21-20 SH. 8	FF126510 SH. 2008	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(8) PER DCN 10	20	06/15/94
M1-E21-35 SH. 1	FF126510 SH. 3501	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM GE FINAL SUBMITTAL NO M1-E21-35(K)-1 SUPERSEDES M1-E21-33 PER DCN 10	13	11/30/90
M1-E21-35 SH. 2	FF126510 SH. 3502	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(2) PER DCN 10	17	01/04/94
M1-E21-35 SH. 3	FF126510 SH. 3503	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(3) PER DCN 10	21	10/04/94
M1-E21-35 SH. 4	FF126510 SH. 3504	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(4) PER DCN 10	18	10/04/94
M1-E21-35 SH. 5	FF126510 SH. 3505	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(5) PER DCN 10	14	11/30/90

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E21-35 SH. 6	FF126510 SH. 3506	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(6) PER DCN 10	14	11/30/90
M1-E21-35 SH. 7	FF126510 SH. 3507	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(7) PER DCN 10	12	11/30/90
M1-E21-35 SH. 8	FF126510 SH. 3508	ELEMENTARY DIAGRAM CORE SPRAY SYSTEM SUPERSEDES M1-E21-33(8) PER DCN 10	11	11/30/90
M1-E32-18 SH. 1	FF127050 SH. 1801	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL GE FINAL SUBMITTAL NO M1-E32-18(G)-1	11	03/19/92
M1-E32-18 SH. 2	FF127050 SH. 1802	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	3	08/18/92
M1-E32-18 SH. 3	FF127050 SH. 1803	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	8	04/05/94
M1-E32-18 SH. 4	FF127050 SH. 1804	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	10	05/23/88
M1-E32-18 SH. 5	FF127050 SH. 1805	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	12	06/03/94
M1-E32-18 SH. 6	FF127050 SH. 1806	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	5	10/31/83
M1-E32-18 SH. 7	FF127050 SH. 1807	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	6	04/05/94
M1-E32-18 SH. 8	FF127050 SH. 1808	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	8	04/05/94
M1-E32-18 SH. 9	FF127050 SH. 1809	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	11	01/04/94
M1-E32-2 SH. 1	FF127050 SH. 201	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL GE FINAL SUBMITTAL NO M1-E32-2(F)-1	12	03/13/92
M1-E32-2 SH. 2	FF127050 SH. 202	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	4	08/01/83

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E32-2 SH. 3	FF127050 SH. 203	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	9	06/11/93
M1-E32-2 SH. 4	FF127050 SH. 204	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	11	05/23/88
M1-E32-2 SH. 5	FF127050 SH. 205	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	11	06/08/94
M1-E32-2 SH. 6	FF127050 SH. 206	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	8	01/29/85
M1-E32-2 SH. 7	FF127050 SH. 207	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	10	06/11/93
M1-E32-2 SH. 8	FF127050 SH. 208	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	9	06/11/93
M1-E32-2 SH. 9	FF127050 SH. 209	ELEMENTARY DIAGRAM MAIN STEAM ISOLATION VALVE LEAKAGE CONTROL	11	06/08/94
M1-E41-59 SH. 1	FF127250 SH. 5901	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	19	12/19/87
M1-E41-59 SH. 2	FF127250 SH. 5902	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(2) PER BLP 29186	16	06/08/94
M1-E41-59 SH. 3	FF127250 SH. 5903	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(3) PER BLP 29186	18	04/06/94
M1-E41-59 SH. 4	FF127250 SH. 5904	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	19	06/08/94
M1-E41-59 SH. 5	FF127250 SH. 5905	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(5) PER BLP 29186	18	08/09/94
M1-E41-59 SH. 7	FF127250 SH. 5907	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(7) PER BLP 29186	14	10/13/88
M1-E41-59 SH. 8	FF127250 SH. 5908	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(8) PER BLP 29186	11	06/08/94

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E41-59 SH. 9	FF127250 SH. 5909	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(9) PER BLP 29186	14	05/08/91
M1-E41-59 SH. 10	FF127250 SH. 5910	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	20	06/08/94
M1-E41-59 SH. 11	FF127250 SH. 5911	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM SUPERSEDES M1-E41-67(11) PER BLP 29186	14	07/06/94
M1-E41-69 SH. 1	FF127250 SH. 6901	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	11	12/19/87
M1-E41-69 SH. 2	FF127250 SH. 6902	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	13	02/23/96
M1-E41-69 SH. 3	FF127250 SH. 6903	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	7	12/19/87
M1-E41-69 SH. 4	FF127250 SH. 6904	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	10	12/06/93
M1-E41-69 SH. 5	FF127250 SH. 6905	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	13	08/09/94
M1-E41-69 SH. 6	FF127250 SH. 6906	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	11	12/06/93
M1-E41-69 SH. 7	FF127250 SH. 6907	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	7	09/28/89
M1-E41-69 SH. 8	FF127250 SH. 6908	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	9	02/09/94
M1-E41-69 SH. 9	FF127250 SH. 6909	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	10	07/22/88
M1-E41-69 SH. 10	FF127250 SH. 6910	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	16	12/06/93
M1-E41-69 SH. 11	FF127250 SH. 6911	ELEMENTARY DIAGRAM HIGH PRESSURE COOLANT INJECTION SYSTEM	8	11/19/91

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-E51-90 SH. 1	FF129010 SH. 9001	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM GE FINAL SUBMITTAL NO M1-E51-90(L)-1	19	06/25/92
M1-E51-90 SH. 2	FF129010 SH. 9002	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	17	06/25/92
M1-E51-90 SH. 3	FF129010 SH. 9003	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	21	08/25/92
M1-E51-90 SH. 4	FF129010 SH. 9004	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	18	08/25/92
M1-E51-90 SH. 5	FF129010 SH. 9005	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	12	06/14/88
M1-E51-90 SH. 6	FF129010 SH. 9006	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	15	06/14/88
M1-E51-90 SH. 7	FF129010 SH. 9007	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	12	07/21/83
M1-E51-90 SH. 8	FF129010 SH. 9008	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	15	09/28/89
M1-E51-90 SH. 9	FF129010 SH. 9009	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	14	09/26/89
M1-E51-90 SH. 10	FF129010 SH. 9010	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	18	03/23/94
M1-E51-90 SH. 11	FF129010 SH. 9011	ELEMENTARY DIAGRAM REACTOR CORE ISOLATION COOLING SYSTEM	11	07/21/83
M1-G33-140 SH. 1	FF133011 SH. 4001	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM GE SUBMITTAL NO M1-G33-140(H)-1	18	07/06/94
M1-G33-140 SH. 2	FF133011 SH. 4002	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	16	06/06/94
M1-G33-140 SH. 3	FF133011 SH. 4003	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	12	06/13/88

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
M1-G33-140 SH. 4	FF133011 SH. 4004	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	16	06/13/88
M1-G33-140 SH. 5	FF133011 SH. 4005	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	15	07/06/94
M1-G33-153 SH. 1	FF133011 SH. 5301	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM GE FINAL SUBMITTAL NO M1-G33-153(K)-1	9	06/13/88
M1-G33-153 SH. 2	FF133011 SH. 5302	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	14	07/03/95
M1-G33-153 SH. 3	FF133011 SH. 5303	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	5	06/13/88
M1-G33-153 SH. 4	FF133011 SH. 5304	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	8	06/13/88
M1-G33-153 SH. 5	FF133011 SH. 5305	ELEMENTARY DIAGRAM REACTOR WATER CLEANUP SYSTEM	5	06/13/88
V-182 SH. 2	B 106522 SH. 2	LOGIC DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE DIESEL GENERATOR BLDG VENT FANS 0V512A 0V512B 0V512C & 0V512D	6	01/05/88
V-182 SH. 2A	B 106522 SH. 2	LOGIC DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT FANS 0V512A 0V512B 0V512C 0V512D	2	01/05/88
V-182 SH. 3	B 106522 SH. 3	LOGIC DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE VENT FANS	6	04/18/91
V-182 SH. 4	B 106522 SH. 4	LOGIC DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE ELECTRIC UNIT HEATERS	5	06/18/91
V-182 SH. 5	B 106522 SH. 5	LOGIC DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE DIESEL GENERATOR BLDG INSTRUMENT SCHEDULE	6	01/05/88
V-182 SH. 6	B 106522 SH. 6	LOGIC DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE DIESEL GENERATOR BLDG BASEMENT VENT FANS 0V511A 0V511B 0V511C & 0V511D	3	06/14/82
V-182 SH. 8	B 106522 SH. 8	INSTRUMENTATION & CONTROL DIAGRAM DIESEL GENERATOR E BLDG AIR FLOW SYSTEM CHANNEL NO 08271E1 THRU E11 08271E K GHD 1677 GH/EDG 1562 AS BUILT FOR SYSTEM 028B	5	09/11/87

TABLE 1.7-1

AE Drawing/Sheet	PP&L Drawing/Sheet	Drawing Description	Revision	Issued
V-182 SH. 8A	B 106522 SH. 8	INSTRUMENT & CONTROL DIAGRAM DIESEL GENERATOR E BLDG AIR FLOW SYSTEM CHANNEL NO 08271E1 THRU E11 08271E K GHD 1677 GH/EDG 1562 AS BUILT FOR SYSTEM 028B	6	01/05/88
V-182 SH. 9	B 106522 SH. 9	LOGIC DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SUPPLY FAN 0V512E1 K GHD 1571 GH/EDG 1527 AS BUILT FOR SYSTEM 028B	5	01/05/88
V-182 SH. 9A	B 106522 SH. 9	LOGIC DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SUPPLY FAN 0V512E1 & 0V512E2 NOTES CHANNEL NO 08271E1 THRU E11 08271E K GHD 1631 GH/EDG 1312 AS BUILT FOR SYSTEM 028B	3	09/11/87
V-182 SH. 10	B 106522 SH. 10	LOGIC DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SUPPLY FAN 0V512E2 CHANNEL NO 08271E1 THRU E11 08271E K GHD 1571 GH/EDG 1527 AS BUILT FOR SYSTEM 028B	5	01/05/88
V-182 SH. 11	B 106522 SH. 11	LOGIC DIAGRAM DIESEL GENERATOR E BLDG EXHAUST FANS 0V512E3 & 0V512E4 CHANNEL NO 08271E1 THRU E11 08271E K GHD 1631 GH/EDG 1312 AS BUILT FOR SYSTEM 028B	3	09/11/87
V-182 SH. 13	B 106522 SH. 13	LOGIC DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SYSTEM ALARMS & INDICATION CHANNEL NO 08207E 08271E1 THRU E10 K GHD 1571 GH/EDG 1527 AS BUILT FOR SYSTEM 028B	5	01/05/88
V-182 SH. 13A	B 106522 SH. 13	LOGIC DIAGRAM DIESEL GENERATOR E BLDG VENTILATION SYSTEM ALARM & INDICATION TRANSFER SCHEME CHANNEL NO 08271A 08271B 028271C 08271D 08271E K GHD 1631 GH/EDG 1312 AS BUILT FOR SYSTEM 028B	3	01/05/88
V-182 SH. 14	B 106522 SH. 14	LOGIC DIAGRAM DIESEL GENERATOR E BLDG BASEMENT & BATTERY ROOM EXHAUST FAN 0V511E CHANNEL NO 08207E 08236 K GHD 1677 GH/EDG 1562 AS BUILT FOR SYSTEM 028A 028B	5	09/11/87
V-182 SH. 15	B 106522 SH. 15	LOGIC DIAGRAM DIESEL GENERATOR E BLDG ELECTRIC UNIT HEATERS CHANNEL NO 08277 THRU 08295 K GHD 1571 GH/EDG 1527 AS BUILT FOR SYSTEM 028B	4	09/11/87
V-182 SH. 16	B 106522 SH. 16	LOGIC DIAGRAM DIESEL GENERATOR E BLDG ELECTRIC BASEBOARD HEATERS CHANNEL NO 08231 08237 K GHD 1571 GH/EDG 1527 AS BUILT FOR SYSTEM 028B	4	09/11/87
V-482 SH. 2	D 162532 SH. 2	LOOP DIAGRAM VC-182 DIESEL GENERATOR BLDG ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE HEATING & VENTILATION DIESEL GENERATOR BLDG AIR TEMPERATURE	7	07/07/83
V-482 SH 3	D 162532 SH. 3	LOOP DIAGRAM DIESEL GENERATOR BLDG & ENGINEERED SAFEGUARD SERVICE WATER PUMPHOUSE HEATING & VENTILATION & AIR TEMPERATURE SUPERSEDES D106282 SHEET 3 REV 0	12	05/21/93
V-482 SH. 4	D 162532 SH. 4	LOOP DIAGRAM DIESEL GENERATOR E BLDG AIR TEMPERATURE GHN 1904 AS BUILT FOR SYSTEM 028B	1	01/08/88

1.8 SYMBOLS AND TERMS USED IN ENGINEERING AND TEXT

1.8.1 TEXT DEFINITIONS AND ABBREVIATIONS

Definitions used throughout the FSAR are listed in the Glossary of Terms, Table 1.8-1. Acronyms and technical abbreviations are listed in Tables 1.8-2 and 1.8-3, respectively.

1.8.2 DRAWING INDEX AND SYMBOLS

Abbreviations used on drawings are listed in Table 1.8-5.

Symbols used on GE supplied Piping and Instrument Diagrams (P&ID's) are shown on Figure 1.8-1. Symbols for other P&ID's are shown on Dwgs. M-100, Sh. 1, M-100, Sh. 2, M-100, Sh. 3, and M-100, Sh. 4. Logic Symbols and Instrument Symbols are shown on Figures 1.8-3 and 1.8-4, respectively.

1.8.3 PIPING IDENTIFICATION

Piping is identified on the Piping and Instrument Diagrams (P&ID's) by a three-group identifier. The first group is the nominal pipe size in inches; the second is a three-letter group for the pipe class; and the third is a three-digit group sequentially assigned within a pipe class.

Example: 6"-HBD-117

Size Class Sequence

The three-letter group for the pipe class is described in detail in Table 1.8-6.

The three-digit sequence number is assigned consecutively to identify specific lines in a pipe class as follows:

Piping common to both units	0-99 and 3001-3999
Piping for Unit 1	100-199 and 1000-1999
Piping for Unit 2	200-299 and 2000-2999

1.8.4 VALVE IDENTIFICATION

All manual and remotely operated valves will have unique identification numbers for tracking purposes and will be shown on the P&ID's.

Listed below are the numbering systems used for each group of valves.

All manual valves, except those which have a GE Master Parts List (MPL) number, and those valves supplied by vendors as part of the equipment package and not installed by Bechtel/PPL will be identified by the following method:

1 52 006

- Unit No. (1)
  - 0-Common
  - 1-Unit 1
  - 2-Unit 2
- System Identification (last 2 digits of P&IDs (52)
- Sequence No. (3 digit numbers) (006)

Remote operated valves which do not have a GE MPL number, are identified by the operator number, e.g.:

HV 1 52 40

- Valve type (HV)
- Unit No. (1)
- P&ID No. (last 2 digits) (52)
- Sequence No. (40)

Those valves in GE's MPL are identified by the GE numbering system, e.g.:

E11 HV 1 F031

- MPL System No. (Referenced on figure notes) (E11)
- Valve Type (HV)
- Unit No. (1)
- GE Valve No. (F031)

Valves that are not numbered but are supplied as part of vendor mounted equipment will be identified in the vendor's operation and maintenance manuals. This is to avoid duplication of numbering these valves.

1.8.5 INSTRUMENT IDENTIFICATION

1.8.5.1 Instrument Components

Identification of instruments and control devices is made by the use of one of the following numbering systems:

1. Instruments and devices within GE scope of design are numbered in accordance with the GE MPL system. Associated devices shown on P&ID's but without any numerical identity are numbered as in 2 below.

2. Except as in 1 above, instrument identifications are based on Instrument Society of America (ISA) Standard S5.1-1973, as modified by Dwgs. M-100, Sh. 1, M-100, Sh. 2, M-100, Sh. 3, and M-100, Sh. 4.

In general, each instrument or device in a measurement loop is assigned the same number, however, loops containing instruments and devices identified in the GE MPL system are an exception to this rule.

When a loop contains more than one instrument component of the same functional type, a suffix letter will be added and used to establish a unique identity for those components.

Redundant measurement loops will be identified by the addition of a suffix letter to each instrument component or device in the loop. In the case of redundant loops containing more than one instrument of the same functional type, the suffix letter will be followed by a number.

Instrument and device numbers are constructed as follows:

	FE	1	11	78	A1
Functional Identification Per 8856-M-100	FE				
Unit Number		1			
Last 2 Digits of P&ID Number			11		
Loop Number				78	
Suffix					A1

A zero in the unit number position indicates that the instrument or device is common to both units.

1.8.5.2 Instrument Location

Instrument components and devices are mounted on racks and panels which are identified by a 5 character, alpha-numeric code. This code is marked adjacent to the instrument component identifier, as shown on Dwg. M-100, Sh. 1.

The code numbers identify the unit number and the general location of the rack or panel by the following block-number assignment:

C001 - C099	NSSS Local Panels and Racks
C101 - C199	Turbine Building
C201 - C299	Reactor Building
C301 - C399	Radwaste Building
C401 - C499	Primary Containment
C501 - C599	Miscellaneous Locations
C601 - C699	Control Structure
C701 - C799	Administration Building

A prefix digit is used to identify the unit or common plant assignment.

With each block-number assignment above, the series from 076 through 099 are reserved for local racks and panels in heating and ventilation service. The following examples illustrate typical rack or panel assignments:

1 C 6 50

Unit Number ---- 1

"C" = Rack or Panel ---- C
"CB" = Component Box ---- C
"Z" = Plant Computer ---- C

Control Structure ---- 6

Panel Number ---- 50

1.8.6 ELECTRICAL COMPONENT IDENTIFICATION

This section describes the methods used to identify electrical equipment locations and to number electrical schemes, cables, and raceways. Additional information is contained in Section 8.3.

1.8.6.1 Equipment Location Numbers

Each piece of electrical equipment is identified by an equipment number. To facilitate cable routing from one equipment location to another, a location number is also assigned to each piece of electrical equipment. Generally, the equipment number and equipment location number for a specific piece of electrical equipment are identical. For large pieces of electrical equipment, such as switchgear, load centers, and motor control centers, which are compartmentalized, the equipment location number consists of the basic equipment number plus additional suffixed information to identify a location within the equipment itself. The following two examples illustrate equipment location numbers:

1 X 1 01

- Unit Number - (1) → 1
- Equipment Classification - (Transformer) → X
- Plant Area - (Turbine Building) → 1
- Sequential Number - (Transformer No. 1) → 01

1 B 1 11 12 1

- Unit Number - (1) → 1
- Equipment Classification - (Motor Control Center (MCC)) → B
- Plant Area - (Turbine Building) → 1
- Sequential number - (MCC No. 11) → 11
- Stack Number - (12, left to right) → 12
- Cubicle Number - (1, top to bottom) → 1

In the first example, the equipment number and equipment location number for transformers 1X101 are identical. In the second example, the basic MCC equipment number 1B111 is suffixed to establish an equipment location number, 1B111121, which identifies a specific compartment within the MCC.

To distinguish one piece of electrical equipment from other duplicate equipment used in the same service, a suffix letter is added to the basic equipment number to establish individual equipment location numbers. For example, if main transformer 1X101 is composed of a bank of three single phase transformers, the transformers for phases A, B and C are identified with equipment location numbers 1X101A, 1X101B and 1X101C, respectively.

Equipment location numbers are generally assigned to items listed in the circuit and raceway schedules. Accordingly, most electrical equipment related to systems such as lighting, communications, and cathodic protection is not included.

Electrical equipment which is an integral part of mechanical equipment is assigned the same number as the mechanical equipment.

All major pieces of electrical equipment are listed in an equipment index. The equipment index provides a description of the equipment and identifies pertinent drawings such as applicable electrical layout drawings and P&ID's.

1.8.6.2 Scheme Numbers

Each electrical scheme is identified by a six character number. The first character is numeric and refers to the plant unit number for which the scheme is applicable. The second character is alphabetic and classifies the scheme by major plant system. The last four characters are numeric, with the exception of GE supplied cables, and provide a sequential, but arbitrary, identity for each scheme. Given below is an example of a typical scheme number.

```
                                                      1          Q          0501
                                                      |          |           |
Unit Number - (1) ------------------------------------           |           |
                                                                 |           |
Plant System - (Nuclear Steam Supply System) ---------------------           |
                                                                             |
Scheme Sequential Number - (Arbitrary No. for RHR Pump 1A) -------------------
```

A log of all schemes is maintained in the scheme number index which contains pertinent information such as scheme description, scheme drawing number and source drawing number.

1.8.6.3 Scheme Cable Numbers

Except for cabling associated with the plant lighting, communications, and cathodic protection systems, each cable in the plant is identified by a scheme cable number composed of nine characters. The first character is alphabetic and indicates the separation group to which the cable belongs. The second character is also alphabetic and denotes the system voltage level. Characters three through eight identify the six character scheme number to which the cable is assigned. The ninth and final character is alphabetic, except for GE supplied cables, and provides a distinctive identity to each cable in the block diagram shown on the scheme drawings.
The following two examples illustrate typical scheme cable numbers:

A K 1Q0501 R

Separation Group - (Safeguard Channel A) ---------- A

Voltage Level - (120 VAC to 250 VDC Control) ---------- K

Scheme Number - (1Q0501 for RHR Pump 1A) ---------- 1Q0501

Cable Identity - (Cable R in Block Diagram) ---------- R

N M 1R3007 D

Separation Group - (Non-Safety Related) ---------- N

Voltage Level - (Low Level Instrumentation) ---------- M

Scheme Number - (Radwaste Bldg. Sump Pump A) ---------- 1R3007

Cable Identity (Cable D in Block Diagram) ---------- D

An alpha-numeric listing of all scheme cable numbers is maintained in the electrical circuit schedule. The circuit schedule also identifies the cable type, quantity of conductors, from and to equipment location numbers, and the cable routing. The circuit schedule uses the first two characters of the scheme cable number as a facility code, ensures that separation and voltage criteria are not violated.

A cable marker is affixed to each end of the cable for permanent identification. Cable markers for Class IE cables have distinguishing colors for each separation group. Additionally, all Class 1E cables are marked at regular intervals along their length with colors corresponding to the cable marker colors.

1.8.6.4 Raceway Numbers

All scheduled electrical cable trays, conduits, conduit sleeves and junction boxes are identified by six character raceway numbers; PGCC ducts by seven character numbers and manholes by five character numbers. The two examples given below illustrate typical raceway numbers for engineered safety feature and non-safety feature cable trays, respectively.

A 1 K B 99

- Separation Group - (Safeguard Channel A) → A
- Unit Number - (1) → 1
- Voltage Level - (120 VAC to 250 VDC Control) → K
- Main or Branch Run - (B) → B
- Section Number - (Tray Section 99) → 99

1 P B C 85

- Unit Number - (1) → 1
- Voltage Level - (250 VDC to 480 VAC Power) → P
- Main Run - (Main Tray B) → B
- Branch Run - (Branch Tray C) → C
- Section Number - (Tray Section 85) → 85

The first character of each engineered safety feature cable tray is an alphabetic letter that relates to the first character of each engineered safety feature scheme cable eligible for routing, therein. Non-safety feature cable tray, whose first character is numeric representing the unit number, may only contain scheme cable numbers prefixed by the letter N. This same practice was followed for conduit numbers as shown below.

A 1 P 999

- Separation Group - (Safeguard Channel A) → A
- Unit Number - (1) → 1
- Voltage Level - (250 VDC to 480 VAC Power) → P
- Conduit Sequential Number - (Arbitrary No.) → 999

1 H B 005

Unit Number - (1) ---- 1
Voltage Level - (13.8KV Power) ---- H
Plant Area - (Turbine Bldg. Elev. 656') ---- B
Conduit Sequential Number - (Arbitrary No.) ---- 005

An alphanumeric listing of all raceway numbers is maintained in the electrical Raceway Schedule, which also contains the raceway type, length from end point locations, percent fill, and list of included cables.

Raceway markers are affixed to each raceway for permanent identification. Identification markers for Class IE raceways are marked at regular intervals along the length of the raceway with unique and distinguishing colors for each separation group corresponding to the cable marker colors.

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Abnormal occurrence	Any reportable occurrence that is determined by the Commission to be significant from the standpoint of public health or safety	
Abnormal Operational Transients	Infrequent design events that may be reasonably expected during the course of planned operations, including events that are a result of (or follow)a single equipment malfunction or operator error. Power failures, pump trips, and rod withdrawal errors are typical of the single malfunctions or errors which may initiate the events in this category.	
Acceptable	Demonstrated to be adequate by the safety analysis of the Plant.	
Accident	A single event, not reasonably expected to occur during the course of plant operations, that has been hypothesized for analyses purposes or postulated from unlikely but conceivable situations and that causes or threatens to cause a violation of one or more fission product barriers.	
Achieving Criticality	All actions which are normally accomplished in bringing the Plant from a condition in which all control rods are fully inserted to a condition in which nuclear criticality is achieved and maintained.	
Achieving Shutdown	Achieving shutdown begins where power operation ends and includes all actions normally accomplished in achieving nuclear shutdown (more than one rod subcritical) following power operation.	
Activated Device	A mechanical module in a system used to accomplish an action. An activated device is controlled by an actuation device.	
Active components	a. Those components whose operability is relied upon to perform a safety function such as safe shutdown of the reactor or mitigation of the consequences of a postulated pipe break in the reactor coolant pressure boundary. b. Active component is one in which mechanical motion must occur to complete the component's intended function.	
Active failure	The failure of an active component such as a piece of mechanical equipment, component of the electrical supply system or instrumentation and control equipment to act on command to perform its design function. Examples include the failure of a motor-operated valve to move to its correct position, the failure of an electrical breaker or relay to respond, the failure of a pump, fan, or diesel generator to start, etc.	
Actuation Device	An electrical or electromechanical module controlled by an electrical decision output used to produce mechanical operation of one or more activated devices, thus achieving necessary action.	
Additional Plant Capability Event	An event which neither qualifies as neither an abnormal operational transient nor an accident but which is postulated to demonstrate some special capability of the Plant.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Administrative Controls	Measures to prevent the existence or development of an unsafe condition in connection with the operation of the reactor. They also define the administrative action to be taken in the event a safety limit or allowed condition for operation is exceeded. Requirements concerning the facility's organization and management, procedures, record keeping, review and audit, and reporting are specified.	
Alteration of the Reactor Core	The act of moving any component in the region above the core support plate, below the upper grid and within the shroud. Normal control rod movement with the control rod drive hydraulic system is not defined as a core alteration. Normal movement of in-core instrumentation and the traversing in-core probe is not defined as a core alteration.	
Alternate Rod Injection	An alternate means of inserting control rods. One of the features provided in order to mitigate a postulated anticipated transient without scram (ATWS) event.	
Analog channel calibration	Adjustment of channel output such that it responds, with acceptable range and accuracy, to know values of the parameter which the channel measures. Calibration shall encompass the entire channel, including alarm or trip, and shall be deemed to include the channel functional test.	
Analog channel check	A qualitative determination of acceptable operability by observation of channel behavior during operation. This determination may include comparison of the channel with other independent channels measuring the same variable.	
Analog channel functional test	Injection of a simulated signal into the channel to verify that it is operable, including alarm and/or trip initiating action.	
Anticipated operational occurrences	Anticipated operational occurrences mean those conditions of normal operation which are expected to occur one or more times during the life of the nuclear power unit and include but are not limited to loss of power to all recirculation pumps, tripping of the turbine-generator set, isolation of the main condensers, and loss of all off-Site power (10 CFR 50 Appendix A).	
Anticipated transients (with Scram)	This group of anticipated abnormal transients include events which present a demand for protection action by the Reactor Protection System and which have a probability of occurrence greater than 10^{-3} per year. The events which fall in this category of anticipated transients are listed below: a. Loss of load b. Excessive load increase c. Loss of one feedwater pump d. Loss of flow (one pump) e. Rod withdrawal f. Startup accident g. Accidental depressurization of Reactor Coolant System h. Plant blackout	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Anticipated Transients Without Scram (ATWS)	Anticipated operational occurrences which require reactor shutdown followed by the failure to insert all control rods; ie. a failure to SCRAM.	
Associated Areas	The off-Site equipment, facilities and structures which are necessary for the operation of the Project. These include the makeup water pump facility, the makeup water pipeline, the discharge structure, the transmission line, the railroad spur, and the rights-of-way and access roads associated with the above.	
Average linear power density	Total thermal power produced in the fuel rods divided by the total active fuel length of all rods in the core.	
Average rod power	Total thermal power produced in the fuel rods divided by the number of fuel rods (assuming all rods have equal length).	
Channel	An arrangement of components and sensors as required to generate a single protective action signal when required by a generating station condition. A Channel loses its identity where single action signals are combined.	
Class IE Electric Systems	The safety classification of the electric equipments and systems that are essential to emergency reactor shutdown containment isolation, reactor core cooling and reactor heat removal or otherwise are essential in preventing significant release of radiation to the environment.	
Closed System	Piping system containing fluid, not freely accessible to the environment, penetrating containment but not communicating with either primary coolant pressure boundary or containment atmosphere.	
Cold Shutdown	When the reactor is in the shutdown mode; the reactor coolant is maintained at equal to or less than 200°F, and the reactor vessel is vented to containment atmosphere.	
Common mode failure	The failure of two or more components of the same or similar design by the same failure mechanism. Such failure mechanisms for components may result from the adverse conditions from a design basis event for which the components were expected by design to remain functional. Such failures may result from a design deficiency or manufacturing deficiency. Redundant equipment can be made inoperable by this mechanism.	
Components	Items from which a system is assembled.	
Containment (primary and secondary)	The structures that enclose components of the reactor coolant pressure boundary and which provides an essentially leaktight barrier against the uncontrolled release of fission products to the environment.	
Containment Atmosphere	Free volume enclosed by the primary containment.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Containment integrity	Exists when all the following conditions exist: a. All nonautomatic containment isolation valves not required for normal operation are closed or under administrative control. b. Blind flanges are properly installed where required. c. The equipment door is properly closed and sealed. d. At least one door in each personnel air lock is properly closed and sealed. e. All automatic containment isolation trip valves are operable or closed. f. The containment leakage satisfies Technical Specification.	
Containment isolation	Establishment of mechanical barrier(s) in appropriate fluid systems penetrating the Containment which would otherwise represent open paths for the fission products in the event of a loss-of-coolant accident inside the Containment.	
Controlled Access Area	The area immediately surrounding the principal Project Structures, enclosed with a fence or other suitable physical barrier, such that entry into this area is controlled. This area will encompass the Reactor Buildings, the Turbine Buildings, the Auxiliary Buildings, Control Building, Diesel-Generator Buildings, Radwaste Building, and the Cooling Towers.	
Controls	Methods and devices by which actuation is used to affect the value of a variable. When used with respect to nuclear reactors, means apparatus and mechanisms, the actuation of which directly affects the reactivity or power level of the reactor.	
Cooldown	Cooldown begins where achieving shutdown ends and includes all actions normally accomplished in the continued removal of decay heat and the reduction of nuclear system temperature and pressure.	
Critical items	Those structures, units (or components) and systems which require a degree of design review, verification, inspection and documentation over and above that applied in the course of normal engineering, procurement and construction. As a minimum, critical items include all structures and systems required to maintain the integrity of the reactor primary system pressure boundary, to provide Containment Engineered Safety Features, assure safe shutdown under all conditions and continued residual heat removal.	
Degree of redundancy	The difference between the number of sensors of a variable and the number of sensors which when tripped will cause an automatic system trip.	
Design Basis	"Design basis" means that information which identifies the specific functions to be performed by a structure, system, or component of a facility, and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state of art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) or the effects of a postulated accident for which a structure, system, or component must meet its functional goals.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Design Basis Accidents (DBA)	The hypothesized accident whose characteristics and consequences are utilized in the design of those systems and components pertinent to the preservation of radioactive material barriers and the restriction of radioactive material release from the barriers upon occurrence of a loss-of-coolant accident. The potential radiation exposures resulting from a DBA are not exceeded by any similar accident postulated from the same general accident assumptions.	
Design Basis Events (DBE)	Postulated events used in a design to establish the performance requirements of structures, systems, and components.	
Design features	Those features of the facility such as materials of construction and geometric arrangements which, if altered or modified, would have a significant effect on safety.	
Design Power	The power level equal to 102% of the licensed or rated core thermal power level. The design power level is equivalent to 4031 MWt.	
Diffuser	The submerged section of the discharge pipeline which has multiple ports.	
Dilution Zone	The boundary of the dilution zone is defined as that point where the Plant discharge is mixed with the Susquehanna River.	
Discharge structure	The diffuser section, connecting discharge pipeline, and anchors, both the shoreline anchors and river bed anchors.	
Drywell	A pressure-containing envelope surrounding the reactor and its recirculation loops which will channel steam resulting from the LOCA through the suppression pool for condensation. Part of primary containment.	
Emergencies	Unplanned events characterized by risks sufficient to require immediate action to avoid or mitigate an abrupt or rapidly deteriorating situation.	
Emergency Conditions (Infrequent Incidents)	Those deviations from Normal Conditions which require shutdown for correction of the conditions or repair of damage in the system. The conditions have a low probability of occurrence but are included to provide assurance that no gross loss of structural integrity will result as a concomitant effect of any damage developed in the system.	
Engineered Safeguards	(Same as Engineered Safety Features).	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Engineered Safety Features (ESF)	a. Features of a unit or system other than reactor trip or those used only for normal operation, that are provided to prevent, limit or mitigate the release of radioactive material in excess of 10 CFR 50.67 limits. b. Engineered Safety Feature System (ESFS) consists of those systems, including essential support systems or components thereof the primary purpose of which during a design basis accident (DBA) will be to: (1) Retain fuel temperatures within design limits by maintaining fuel coolant inventory and temperatures within design limits. (2) Maintain fuel temperatures within design limits by inserting auxiliary negative reactivity. (3) Prevent the escape of radioactive materials to the environment in excess of 10 CFR 50.67 limits by isolation of the systems or structures. (4) Reduce the quantity of radioactivity available for leakage and its potential for leakage by purification, cleanup, containment heat removal and containment pressure reduction. (5) Control the concentration of combustible gases in the containment systems within established limits.	
Exclusion area	A circle within a radius of 1800 ft from the centerline of the reactors, as defined by 10CFR 100.3.	
Extended Load Line Limit Analysis	Safety analyses performed to demonstrate adequate safety margins in support of a license amendment permitting operation with an elevated load line on the power-flow map; i.e. with increased thermal power at a given recirculation flow.	
Failure	The termination of the ability of an item to perform its required function. Failures may be unannounced and not detected until the next test (unannounced failure), or they may be announced and detected by any number of methods at the instant of occurrence (announced failure).	
Faulted Condition (Limiting Faults)	Those combinations of conditions associated with extremely-low-probability, postulated events whose consequences are such that the integrity and operability of the nuclear energy system may be impaired to the extent that considerations of public health and safety are involved. Such considerations require compliance with safety criteria as may be specified by jurisdictional authorities.	
Functional Test	The manual operation or initiation of a system, subsystem, or component to verify that it functions within design tolerances (eg, the manual start of a core spray pump to verify that it runs and that it pumps the required volume of water).	
General Design Criteria (GDC)	A set of design criteria for structures, systems, and components important to safety, which are given in Appendix A to 10 CFR 50, and provide reasonable assurance that the Plant can be operated without undue risk to the health and safety of the public.	
Globe Stop Check Valve (GCK)	These valves shall be designed to normally function as check valves, but in addition they shall be provided with means for positive shutoff using manual or mechanical actuators.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Heatup	Heatup begins where achieving criticality ends and includes all actions which are normally accomplished in approaching nuclear system rated temperature and pressure by using nuclear power (reactor critical). Heatup extends through warmup and synchronization of the turbine generator.	
High radiation area	Any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material at such levels that a major portion of body could receive in any one hour a dose in excess of 100 mrem.	
Hot shutdown	See Technical Specification Section 1.1.	
Startup/Hot standby	See Technical Specification Section 1.1.	
Immediate	Immediate means that the required action will be initiated as soon as practicable considering the safe operation of the unit and the importance of the required action.	
Inactive components	Those components whose operability (eg, valve opening or closing, pump operation or trip) are not relied upon to perform the system function during the transients or events considered in the respective operating condition categories.	
Incident	Any natural or accidental event of infrequent occurrence and its related consequences which affect the Plant operation and require the use of Engineered Safety Feature systems. Such events, which are analyzed independently and are not assumed to occur simultaneously, include the loss-of-coolant accident, steam line ruptures, steam generator tube ruptures, etc. A system blackout may be an insolated occurrence or may be concurrent with any event requiring Engineered Safety Feature systems use.	
Incident Detection Circuitry	Includes those trip systems which are used to sense the occurrence of an incident.	
Increased Core Flow	Operation with core flow greater than 100% of original design. Used to provide additional reactivity at end of core life to permit a longer fuel cycle and more economic operation.	
Instrument Calibration	An instrument calibration means the adjustment of an instrument signal output so that it corresponds, within acceptable range and accuracy, to a known value(s) of the parameter which the instrument monitors. Calibration shall encompass the entire instrument including actuation, alarm, or trip.	
Channel check	See Technical Specification Section 1.1.	
Channel Functional Test	See Technical Specification Section 1.1.	
Irradiated Fuel	Fuel that has been in the reactor during reactor operation.	
Isolated Condition	Condition in which the reactor is isolated from the main condenser.	
Limiting conditions for operation	The lowest functional capability or performance levels of equipment required for safe operation of the facility.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Limiting safety system settings	Settings for automatic protective devices are related to those variables having significant safety functions. (Where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting has been chosen so that automatic protective action will correct the most severe abnormal situation anticipated before a safety limit is exceeded).	
Linear power density	The thermal power produced per unit length of fuel rod (kW/ft). Since fuel assembly geometry is standardized, this is the unit of power density most commonly used. For all practical purposes it differs from kW/liter by a constant factor which includes geometry and the fraction of the total thermal power which is generated in the fuel rod.	
Load Group	An arrangement of buses, transfers, switching equipment, and loads fed from a common power supply.	
Local heat flux	The heat flux at the outer surface of the cladding (Btu/ft^{2}hr). For nominal rod parameters this differs from linear power density by a constant factor.	
Logic	That array of components which combines individual bistable output signals to produce decision outputs.	
Logic channel	A logic channel is a group of logic matrices which operate in response to the digital single action signals from the analog channels to generate a protective action signal.	
Logic System functional test	See Technical Specification Section 1.1.	
Long Term	The remainder of the recovery period following the short term. In comparison with the short term where the main concern is to remain within NRC specified site criteria, the long-term period of operation involves bringing the Plant to cold shutdown conditions where access to the Containment can be gained and repair effected.	
Loss-of-Coolant Accident (LOCA)	Those postulated accidents that result from the loss of reactor coolant, at a rate in excess of the capability of the Reactor Coolant Makeup System, from breaks of pipes containing reactor coolant, up to and including a break equivalent in size to the double-ended rupture of the largest pipe of the Reactor Coolant System.	
Low Population Zone (LPZ)	The area included in a three mile radius from the midpoint of the centerline between the two reactor buildings on on Plant Site, and in 10 CFR 100.3 as defined.	
Low power physics tests	Tests below a nominal five percent of rated power which measure fundamental characteristics of the reactor core and related instrumentation.	
Manual Component	A component, the operability of which is relied upon to perform a manual nuclear safety function such as providing manual action or operator information required for initiation of action for safe shutdown of the reactor of mitigation of the consequences of an accident.	
Material surveillance program	The provisions for the placement of reactor vessel material specimens in the reactor vessel, and the program of periodic withdrawal and testing of such specimens to monitor, over the service life of the vessel, changes in the fracture toughness properties of the vessel as a result of neutron irradiation.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Minimum Critical Heat Flux Ratio (MCHFR)	The lowest value of the ratio of critical heat flux (that heat flux which results in transition boiling) to the actual heat flux at the same location.	
Minimum degree of redundancy	The degree of redundancy below which operation is prohibited or otherwise restricted by the Technical Specifications.	
Missile Barrier	A Physical barrier which protects essential components, systems or structures from potential missiles arising from consequences of a loss-of coolant accident.	
Mode	See Technical Specification Section 1.1.	
Module	Any assembly of interconnected components which constitutes an identifiable device, instrument, or piece of equipment. A module can be disconnected, removed as a unit, and replaced with a spare. It has definable performance characteristics which permit it to be tested as a unit. A module could be a card or other subassembly of a larger device, provided it meets the requirements of this definition.	
Normal conditions	Normal conditions are any condition in the course of system startup, operation in the design power range, hot standby and system shutdown, other than Upset, Emergency, Faulted or Testing Conditions.	
Normal operation	Operation of the plant under planned, anticipated conditions including, but not limited to, the following: a. Reactor critical (any temperature) b. Power operation c. Reactor startup d. Reactor shutdown e. Refueling f. Periodic testing g. Nuclear system cooldown h. Nuclear system heatup i. Standby (reactor shutdown, nuclear system maintained at constant temperature)	
Nuclear-fueled electrical generating facility (the Plant)	The reactor, turbine-generator, cooling tower, associated buildings (reactor building, turbine building, and administration building), and the switchyard.	
Nuclear Power Unit	A nuclear power unit means a nuclear power reactor and associated equipment necessary for electric power generation and includes those structures, systems, and components required to provide reasonable assurance the facility can be operated without undue risk to the health and safety of the public.	
Nuclear Safety Operational Analysis	A systematic identification of the requirements for the limitations on plant operation necessary to satisfy nuclear safety operational criteria.	
Nuclear Safety Operational Criteria	A set of standards used to select nuclear safety operational requirements.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Nuclear System	Generally includes those systems most closely associated with the reactor vessel which are designed to contain or be in communication with the water and steam coming from or going to the reactor core. The nuclear system includes the following: a. Reactor vessel b. Reactor assembly and internals c. Reactor core d. Main steam lines from reactor vessel out to and including the isolation valve outside the Containment e. Neutron monitoring system f. Reactor recirculation system g. Control rod drive system h. Residual heat removal system i. Reactor core isolation cooling system j. Emergency core cooling systems k. Reactor water cleanup system l. Feedwater system piping between the reactor vessel and the first valve outside the Containment m. Pressure relief system	
Nuclear System Process Barrier	See Reactor Coolant Pressure Boundary	
Occupational dose	Include exposure of an individual to radiation (i) in a restricted area; or (ii) in the course of employment in which the individual's duties involve exposure to radiation, provided that "occupational dose" shall not be deemed to include any exposures of an individual to radiation for the purpose of medical diagnosis or medical therapy of such individual.	
Operable	See Technical Specification Section 1.1.	
Operating	A system or component is operating when it is performing its intended functions in the required manner.	
Operating Cycle	Interval between the end of one refueling outage and the end of the next subsequent refueling outage.	
Operational	The adjective "operational", along with its noun and verb forms, is used in reference to the working or functioning of the Plant, in contrast to the design of the Plant.	
Operating reports	These reports include the Startup Report, First Year Operation Report, and Semiannual Operating Records. Operating reports are submitted in writing to the Director, Division of Reactor Licensing, USNRC, Washington, D.C. 20545.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Operating Basis Earthquake (OBE)	That earthquake which produces vibratory ground motion for which those structures, systems, and components necessary for power generation are designed to remain operable.	
Operator	Any individual who manipulates a control of a facility. An individual is deemed to manipulate a control if he directs another to manipulate a control	
Operator error	An active deviation from written operating procedures or nuclear plant standard operating practices. A single operator error is the set of actions that is a direct consequence of a single reasonably expected erroneous decision. The set of actions is limited as follows: a. Those actions that could be performed by only one person. b. Those actions that would have constituted a correct procedure had the initial decision been correct. c. Those actions that are subsequent to the initial operator error and that affect the designed operation of the plant but are not necessarily directly related to operator error.	
Passive Component	A component in which mechanical movement does not occur in order for the component to perform its intended function.	
Passive failure	The structural failure of a static component which limits the component's effectiveness in carrying out its design function. When applied to a fluid system, this could mean a break in the pressure boundary.	
Peaking Factor	The ratio of the maximum fuel rod surface heat flux in an assembly to the average surface heat flux of the core.	
Penetration Assembly, Elec.	Provides the means to allow passage of electrical circuits through a single aperture (nozzle or other opening) in the containment pressure barrier, while maintaining the integrity of the pressure barrier.	
Pennsylvania Power & Light Company (PP&L)	The owner-operator of the Project, having total controlling ownership.	
Period of recovery	The time necessary to bring the Plant to a cold shutdown and regain access to faulted equipment. The recovery period is the sum of the short-term and long-term periods.	
Place in Cold Shutdown Condition	Conduct an uninterrupted normal Plant shutdown operation until the cold shutdown condition is attained.	
Place in Isolated Condition	Conduct an uninterrupted normal isolation of the reactor from the main (turbine) condenser including the closure of the main steam line isolation valves.	
Place in Shutdown Condition	Conduct an uninterrupted normal plant shutdown operation until shutdown is attained.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Planned Operation	Normal plant operation under planned conditions in the absence of significant abnormalities. Operations subsequent to an incident (transient, accident, or special event) are not considered planned operations until the procedures being followed or equipment being used are identical to those used during any one of the defined planned operations. The established planned operations can be considered as a chronological sequence: refueling outage; achieving criticality; heatup; power operation; achieving shutdown; cooldown; refueling outage. The following planned operations are identified: a. Refueling Outage b. Achieving Criticality c. Heatup d. Reactor Power Operation e. Achieving Shutdown f. Cooldown	
Plant	Those structures, systems and components that make up the Susquehanna Steam Electric Station.	
Power density	The thermal power produced per unit volume of the core (kW/liter).	
Power Generation	When used to modify such words as design basis, action and system, this term indicates that the objective, design basis, action, or system is related to the mission of the Plant, to generate electrical power, as opposed to concerns considered to be of primary safety importance. Thus, the words “power generation” identify aspects of the Plant which are not considered to be of primary importance with respect to safety.	
Power Generation Design Basis	The power generation design basis for a power generation system states in functional terms the unique design requirements which establish the limits within which the power generation objective shall be met. A safety system may have a power generation design basis which states in functional terms the unique design requirements which establish the limits within which the power generation objective for the system shall be met.	
Power Generation Evaluation	Shows how the system satisfies some or all of the power generation design bases. Because power generation evaluations are not directly pertinent to public safety, generally they are not included. However, where a system or component has both safety and power generation objectives, a power generation evaluation can clarify the safety versus power generation capabilities.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Power Generation System	Any system, the actions of which are not essential to a safety action, but which are essential to a power generation action. Power generation systems are provided for any of the following purposes: a. To carry out the mission of the Plant-generate electrical power through planned operation. b. To avoid conditions which would limit the ability of the Plant to generate electrical power. c. To facilitate and expedite the return to conditions permitting the use of the Plant to generate electrical power following an abnormal operational transient, accident, or special event.	
Power operation condition	When the reactor is critical and the neutron flux power range instrumentation indicates greater than two percent of rated power.	
Power uprate	Evaluations, tests, modifications, setpoint changes, and license amendments which permitted an increase in rated thermal power from the original 3293 Mwt to 3441 Mwt; allowing an increase in the nominal generator rating from approximately 1100 to approximately 1150 MWe, and in the net plant rating from approximately 1050 MWe to approximately 1100 MWe. Extended Power Uprate (EPU): The operating license for both units was further modified to permit operation at 3952 MWt with a nominal generator output of 1300 MWe.	
Preferred power source	That power supply which is preferred to furnish electrical energy under accident or post accident. It is obtained from start-up transformers. The switchgear is arranged to auto transfer from one preferred source to another preferred source in the event the preferred source fails.	
Preferred power system	The off-site external commercial power system.	
Preoperational Test Program	The preoperational test program applicable to the nuclear steam supply system is the test program conducted prior to fuel loading. The test program applicable to other Plant systems is the test program conducted prior to that system's required operation.	
Principal design criteria	The criteria which establish the necessary design, fabrication, construction, testing and performance requirements for structures, systems and components important to safety, that is, structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the health and safety of the public.	
Principal Project structures	The Reactor Buildings, Control Buildings, Diesel Generator Building, Radwaste Building, Turbine Buildings, and Cooling Towers.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Probable maximum flood (PMF)	The hypothetical flood characteristics (peak discharge, volume and hydrograph shape) that are considered to be the most severe “reasonably possible”: at a particular location, based on relative comprehensive hydrometeorological analyses of critical runoff producing precipitation (and snowmelt, if pertinent) and hydrological factors favorable for maximum flood runoff. Refer to Chapter 2 of the SSES FSAR for specific values which apply to the Susquehanna Steam Electric Station.	
Probable maximum precipitation (PMP)	The theoretically greatest precipitation over the applicable drainage area that would produce flood flows that have virtually no risk of being exceeded. Refer to Chapter 2 of the SSES FSAR for specific values which apply to the Susquehanna Steam Electric Station.	
Probable maximum winds	The hypothetical tornado or other cyclonictype windstorm that might result from the most severe combinations of meteorological parameters that are considered reasonably possible in the region involved, if the tornado or other type windstorm should approach the point under study along a critical path and at optimum rate of movement.	
Protection System	The aggregate of the protective signal system and the protective actuator system	
Protective action	a. Protective action at the channel level is the generation of a signal by a single channel when the variable(s) sensed exceeds a limit. b. Protective action at the system level is the operation of sufficient actuated equipment to accomplish a protective function (for example: rapid insertion of control rod, closing of containment isolation valves, safety injection, core spray).	
Protective Actuator System	An arrangement of components that performs a protective action when it receives a signal from the protective signal system (for example: control rods, their drive mechanisms and their trip mechanisms; isolation valves, their operators and their contractors; core spray pumps, their motors and circuit breakers).	
Protective function	Any one of the functions necessary to limit the safety consequences of a design basis event (for example: rapid reduction of reactor power following a control rod ejection, isolation of the Containment following a steam line break, removal of heat from the core following a loss-of-coolant-accident.	
Quality Assurance (QA)	All those planned and systematic actions necessary to provide adequate confidence that a structure, system or component will perform satisfactorily in service. Quality assurance includes quality control, which comprises those quality assurance actions related to physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component, or system of predetermined requirements.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Quality Control (QC)	Those quality assurance actions related to physical characteristics of a material, structure, component, or system which provide a means to control the quality of the material, structure, component or system to predetermined requirements.	
Q-Listed system	Q-Listed systems, structures and components are those which prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. They include materials, structures, and equipment whose failure could cause significant release of radioactivity to the environment comparable to 10 CFR 50.67 limits at the Site exclusion distance, or which are vital to the safe shutdown of the Plant, or which are necessary for the removal of decay and sensible heat from the reactor.	
Quality Group	A classification which identifies the importance of structures, systems, and components with respect to Plant safety functions in accordance with definitions given in NRC Regulatory Guide 1.26.	
Radiation area	Any area, accessible to personnel, in which there exists radiation originating in whole or in part within licensed material, at such levels that a major portion of the body could receive in any one hour a dose in excess of 5 mrem, or in any five consecutive days a dose in excess of 100 mrem.	
Radioactive Material Barrier	Includes the systems, structures, or equipment that together physically prevent the uncontrolled release of radioactive materials. The barriers are the fuel cladding, the reactor coolant system and the Containment.	
Radioactive waste	Radioactive wastes are solids, liquids, and gaseous effluents from the radioactive waste systems that have concentration or radioactivity in excess of background.	
Rated power	The power level at which the reactor is producing 100 percent of reactor vessel rated steam flow. This is the maximum power that could be authorized by the operating license. Rated coolant flow, rated neutron flux and rated nuclear system pressure refer to values of these parameters when the reactor is at rated power.	
Reactivity	A state variable of neutron chain reactions which is indicative of a deviation in the chain reaction from criticality. It is measured in terms of where p=keff-1/keff. Positive valves correspond to a supercritical state and negative values to a subcritical state. Usage has established “units” of delta k/k for reactivity change. This term (delta k/k) is used to represent a departure from criticality, and is referred to as reactivity worth. Reactivity worth is the reactivity attributable to the specified component material, portion of material, or void in the nuclear reactor.	
Reactor Building	Structural complex enclosing the primary containment, and forming secondary containment.	
Reactor Coolant System	The vessels, pipes, pumps, tubes, valves and similar process equipment that contain the steam, water, gases, and radioactive materials coming from, going to, or in communication with the reactor vessel.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Reactor coolant pressure boundary (RCPB)	All those pressure-containing components such as pressure vessels, piping, pumps and valves, which are (1) part of the Reactor Coolant System, or (2) connected to the Reactor Coolant System, up to and including any and all of the following: a. The outermost containment isolation valve in system piping which penetrates primary reactor Containment. b. The second of two valves normally closed during normal reactor operation in system piping which does not penetrate primary reactor Containment. The Reactor Coolant System safety and relief valves.	
Reactor critical	When the neutron chain reaction is self-sustaining and keff = 1.0.	
Reactor Power Operations	Reactor power operation begins after heatup is complete and includes any operation with the mode switch in the “Startup” or “Run” position with the reactor critical and above 1 percent rated power.	
Reactor Vessel Pressure	Unless otherwise indicated, reactor vessel pressures are those measured by the reactor vessel steam space detectors.	
Redundant equipment or system	An equipment or system that duplicates the essential function of another equipment or system to the extent that either may perform the required function regardless of the state of operation or failure of the other.	
Refueling Mode	See Technical Specification Section 1.1.	
Refueling operation condition	Any operation within the Containment involving movement of core components when the vessel head is completely unbolted or removed and there is fuel in the reactor.	
Refueling Outage	The period of time between the shutdown of the unit prior to a refueling and the startup of the unit after that refueling. For the purpose of designating frequency of testing and surveillance, a refueling outage shall mean a regularly scheduled outage. However, where such outages occur within 8 months of the completion of the previous refueling outage, the required surveillance testing need not be performed until the next regularly scheduled outage.	
Refueling shutdown condition	When the reactor is subcritical by at least 10,000 pcm, Tavg is ≤140°F, and fuel or fuel inserts are scheduled to be moved to or from the reactor core.	
Reliability	The probability that a component will perform its specified function without failure for a specified time in a specified environment.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Reportable Occurrence	They are as follows: 1) Failure of the reactor protection system or other systems settings to initiate the required protective function by the time a monitored parameter reaches the setpoint specified as the limiting safety-system setting in the technical Specifications or failure to complete the required protective function. 2) Operation of the unit or affected systems when any parameter or operation subject to a limiting condition for operation is less conservative than the least conservative aspect of the limiting condition for operation established in the technical specifications. 3) Abnormal degradation discovered in fuel cladding, reactor coolant pressure boundary, or primary containment.	
	4) Reactivity anomalies involving disagreement with the predicted value of reactivity balance under steady-state conditions during power operation greater than or equal to 1% $\triangle k/k$; a calculated reactivity balance indicating 5 shutdown margin less conservative than specified in the technical specifications; short-term reactivity increases that correspond to a reactor period of less than 5 seconds or, if subcritical, an unplanned reactivity insertion of more than 0.5% $\triangle k/k$; or occurrence of any unplanned criticality. 5) Failure or malfunction or one or more components which prevents or could prevent, by itself, the fulfillment of the functional requirements of system(s) used to cope with accidents analyzed in the SAR. 6) Personnel error or procedural inadequacy which prevents or could prevent, by itself, the fulfillment of the functional requirements of systems(s) used to cope with accidents analyzed in the SAR. 7) Conditions arising from natural or manmade events that as a direct result of the event, require plant shutdown, operation of safety systems, or other protective measures required by the technical specifications.	
	8) Errors discovered in the transient or accident analyses or in the method used for such analysis as described in the safety analysis report or in the bases for the technical specifications but have or could have permitted reactor operation in a manner less conservative than assumed in the analyses 9) Performance of structures, systems, or components that requires remedial action or corrective measures to prevent operation in a manner less conservative than that assumed in the accident analyses in the SAR or technical Specifications bases; or discovery during plant life of conditions not specifically considered in the SAR or technical Specifications that require remedial action or corrective measures to prevent the existence or development of an unsafe condition.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Response spectrum	A plot of the maximum response of single degree of freedom bodies, at a damping value expressed as a percent of critical damping, of different natural frequencies, mounted on the surface of interest (that is, on the ground for the ground response spectrum or on the floor of a building for that floor's floor response spectrum) when the surface is subjected to a given earthquake's motion. NOTE: The response spectrum is not the floor motion or the ground motion.	
Restricted area	Any area access which is controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials. "Restricted Area" shall not include any areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.	
Rod power or rod integral power	The length integrated linear power in one rod (kW).	
Run Mode	See Technical Specification Section 1.1.	
Safe Shutdown Earthquake (SSE)	The "Safe Shutdown Earthquake" is that maximum probable earthquake which produces the vibratory ground motion for which structures, systems and components designed to Seismic Category I requirements remain functional.	
Safety	When used to modify such words as objective, design basis, action, and system, the word indicates that, that objective, design basis, action, or system is related to concerns considered to be of safety significance, as opposed to the Plant mission - to generate electrical power. Thus, the word "safety" identifies aspects of the plant which are considered to be of importance with respect to safety. A safety objective or safety design basis does not necessarily indicate that the system is an engineered safety feature.	
Safety Action	An ultimate action in the Plant which is essential to the avoidance of specified conditions considered to be of safety significance. The specified conditions are those that are most directly related to the ultimate limits on the integrity of the radioactive material barriers and the release of radioactive material. There are safety actions associated with planned operation, abnormal operational transients, accidents, and special events. Safety actions include such actions as reactor scram, emergency core cooling, reactor shutdown from outside the control room and the indication to the operator of the values of certain process variables.	
Safety Class	A classification which identifies the importance of structures systems, and components with respect to Plant functions in accordance with definitions given in ANSI N212 for BWR's	
Safety Design Basis	The safety design basis for a safety system states in functional terms the unique design requirements that establish the limits within which the safety objective shall be met. A power generation system may have a safety design basis which states in functional terms the unique design requirements that ensure that neither planned operation nor operational failure by the system results in conditions for which Plant safety actions would be inadequate.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Safety Evaluation	Shows how the system satisfies the safety design bases. A safety evaluation is performed only for those systems that have safety design bases. Safety evaluations form the basis for the Technical Specifications and establish why specific safety limitations are imposed.	
Safety limits	Limits upon important process variables which are found to be necessary to reasonably protect the integrity of certain of the physical barriers which guard against the uncontrolled release of radioactivity.	
Safety Related	See Section 17.2.2 for this definition	
Safety System	Any system, group of systems, components, or groups of components the actions of which are essential to accomplishing a safety action.	
Scram	Refers to the automatic rapid insertion of control rods into the reactor core in response to the detection of undesirable conditions.	
Seiche	An oscillation of the surface of a lake or landlocked sea that varies in period from a few minutes to several hours and is thought to be initiated chiefly by local variations in atmospheric pressure aided in some instances by winds and tidal currents and that continues for a time after the inequalities of atmospheric pressure have disappeared.	
Seismic Category I	Plant features required to assure 1) the integrity of the reactor coolant pressure boundary, 2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or 3) the capability to prevent or mitigate the consequences of accidents which could result in potential off-Site exposures comparable to the guideline exposure of 10 CFR 50.67. Plant features required to meet NRC GDC-1 of Appendix A to 10 CFR 50 and Appendix B of 10 CFR 50. Plant features required to meet NRC GDC-2 of Appendix A to 10 CFR 50 and Proposed Appendix A to 10 CFR 100. Plant features designed to withstand effects of the Safe Shutdown Earthquake.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Seismic Category II (Non-Seismic Category I)	Plant features not required to assure 1) the integrity of the reactor coolant pressure boundary, 2) the capability to shut down the reactor and maintain it in a safe shutdown condition, or 3) the capability to prevent or mitigate the consequences of accidents which could result in exposures comparable to the guidelines of exposures of 10 CFR 50.67. Plant features not required to meet NRC GDC-1 of Appendix A to 10 CFR 50 and Appendix B to 10 CFR 50. Plant features not required to meet NRC GDC-2 of Appendix A to 10 CFR 50 and proposed Appendix A to 10 CFR 100. Plant features not designed to withstand the effects of the Safe Shutdown Earthquake.	
Senior Operator	Any individual designated by a facility licensee under 10 CFR 50 to direct the licensed activities of licensed operators.	
Sensor	That part of a channel used to detect variations in a measured variable.	
Service conditions	Environmental, power, and signal conditions expected as a result of normal operating requirements, expected extremes in operating requirements, and postulated conditions appropriate for the design basis events of the station.	
Short term	The time immediately following the incident during which automatic actions are performed, system responses are checked, type of incident is identified and preparations for long-term recovery operations are made. The short term is the first 24 hours following initiation of system operations after the incident.	
Shut Down	See Technical Specification Section 1.1.	
Shutdown Mode	See Technical Specification Section 1.1.	
Simulated Automatic Actuation	Simulated automatic actuation means applying a simulated signal to sensor to actuate the circuit in question.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Single failure	a. An occurrence which results in the loss of capability of a component to perform its intended safety functions. Multiple failures resulting from a single occurrence are considered to be a single failure. Fluid and electrical systems are considered to be designed against and assumed single failure if neither (1) a single failure of any active component (assuming passive components function properly) nor (2) a single failure of any passive component (assuming active components function properly) results in a loss of the capability of the system to perform its safety functions. b. Single failures are spontaneous occurrences imposed upon safety systems that are required to respond to a design basis event. They are postulated in spite of the fact that they were designed to remain functional under the adverse condition imposed by the accident. No mechanism for the cause of the single failure need be postulated. Single failures of passive components in electrical systems should be assumed in designing against a single failure.	
Site Features	Those features that are important to safety by virtue of the physical setting of the Plant.	
Spring Loaded Piston Actuated Check Valve (SLPACK)	Spring loaded piston actuated check valves operate as follows for the following modes: a. <u>During Normal Flow</u>: A spring loaded piston operator is held open by air pressure. Meanwhile, the valve is fully open by action of force due to flow alone. b. <u>During Accidental Loss of Operator Air</u>: The valve shall remain in the fully open position when the flow rate is equal to or greater than the normal flow rate indicated in the Valve Data Sheets. With a flow rate less than normal, the valve may be partially open due to the force of spring against force due to flow. c. <u>Upon Reversal of Flow</u>: Valve shall tightly shut as a normal check valve. In addition, the Control room operator will assist in starting valve closure by sending a remote signal to open a fail-open solenoid valve, releasing air pressure from the operator cylinder. All signal wiring will be furnished by others.	
Standby power source	The power supply that is selected to furnish electrical energy when the preferred power supply is not available. It consists if an electrical generating unit and all necessary auxiliaries, usually a diesel generator set.	
Standby power system	Those on Site power sources and their distribution equipment provided to energize devices essential to safety and capable of operation independently of the preferred power system.	
Startup Mode	See Technical Specification Section 1.1.	
Startup testing	After fuel has been loaded into the reactor, testing is conducted under conditions similar to those for Hot Functional Testing with the reactor subcritical to complete those tests which could not be completed during the initial hot functional testing and those which must be done with the core in position.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Suppression Pool	A pool of water, located in the lower section of the Containment. During relief-valve discharge and postulated LOCA's, it serves as a heat sink and a pressure-suppression water pool comparable to the pool in the torus or suppression chamber of earlier BWR plants.	
Surveillance Frequency	See Technical Specification Section 1.4.	
Surveillance requirements	Requirements relating to test, calibration or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within the safety limits and that the limiting conditions of operation will be met.	
Swing bus	A bus that is automatically transferred to one or the other of two redundant standby power sources.	
System Redundancy	System that duplicates an essential function of another system to the extent that either may perform a required function regardless of the state of operation or failure of the other.	
Technical Specifications (as used in the FSAR)	Encompass the nuclear safety operational requirements and limits to be used by plant operations and management personnel. They are prepared in accordance with the requirements of 10 CFR 50.36 and are incorporated by reference into the operating license issued by the U.S. Nuclear Regulatory Commission.	
Testing Conditions	Testing conditions are those tests in addition to the ten (10) hydrostatic or pneumatic tests permitted by ASME Section III, paragraphs NB-6222 and NB-6322 including leak tests or subsequent hydrostatic tests.	
Testable Check Valve	These valves are designed to normally function as a check valve, but in addition, they shall be provided with a manual test lever to prove operability during shutdown.	
Test Duration	The elapsed time between test initiation and test termination.	
Test Interval	The elapsed time between the initiation of identical tests.	
Thermal power	The total core heat transfer rate from the fuel and the coolant.	
Tornado criteria	The design parameters applicable to the design tornado, such as rotational and translational velocities, design pressure differential and associated time interval and the tornado-generated missile impact load with a statement of whether the imposed loads will be established simultaneously in establishing the tornado design.	
Transition Boiling	Transition boiling means the boiling regime between nucleate and film boiling. Transition boiling is the regime in which both nucleate and film boiling occur intermittently with neither type being completely stable.	
Trip	The change of state of a bistable device that represents the change from a normal condition. A trip signal, which results from a trip, is generated in the channels of a trip system and produces subsequent trips and trip signals throughout the system as directed by the logic.	
Trip System	That portion of a system encompassing one or more channels, logic and bistable devices used to produce signals to the actuation logic. A trip system terminates and loses its identity where outputs are combined in logic.	

Table 1.8-1

SSES PROJECT GLOSSARY TERMS

TERM	DEFINITION	REFERENCE
Type tests	Tests made on one or more units to verify adequacy of design.	
Ultimate Heat Sink	The spray pond and associated structures and components.	
Unrestricted area	Any area access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials and any area used for residential quarters.	
Upset Conditions (Incidents of Moderate Frequency)	Any deviations from Normal Conditions anticipated to occur often enough that design should include a capability to withstand the conditions without operational impairment. The Upset Conditions include those transients which result from any single operator error or control malfunction, transients caused by a fault in a system component requiring its isolation from the system and transients due to loss of load or power. Upset Conditions include any abnormal incidents not resulting in a forced outage and also forced outages for which the corrective action does not include any repair of mechanical damage. The estimated duration of an Upset Condition shall be included in the Design Specifications.	

Table Rev. 55

Table 1.8-2

ACRONYMS

NAME	ABBREVIATION
Alternate Rod Injection	ARI
American Concrete Institute	ACI
American Institute of Steel Construction, Inc.	AISC
American National Standards Institute	ANSI
American Society of Civil Engineers	ASCE
American Society of Mechanical Engineers	ASME
American Society of Mechanic Engineers Boiler and Pressure Vessel Code	ASME B&PV Code
American Society for Testing and Materials	ASTM
Anticipated Transient Without Scram	ATWS
Anticipated Transient Without Scram Recirculation Pump Trip	ATWS RPT
American Welding Society	AWS
American Petroleum Institute	API
American Water Works Association	AWWA
Area Radiation Monitor	ARM
Areva NP, Inc.	AREVA
As Low As Reasonably Achievable (radiation dose)	ALARA
Automatic Depressurization	ADS
Average Power Range Monitor	APRM
Balance of Plant	BOP
Bechtel Power Corporation (San Francisco)	Bechtel
Beginning of Core Life	BOL
Boiling Water Reactor	BWR
Boron Injection Initiation Temperature	BIIT
Closed Cooling Water	CCW
Control Rod Drive	CRD
Control Rod Position Indicator	CRPI
Core Spray	CS
Critical Power Ratio	CPR
Departure from Nucleate Boiling	DNB
Design Assessment Report	DAR
Design Basis Accident	DBA
Diesel Engine Generator	DG
Drawing	Dwg.
Dye Penetrant Test/Liquid Penetrant Test	PT
East	E
Electrohydraulic Control	EHC
Emergency Core Cooling System	ECCS
End of Core Life	EOL
End of Cycle	EOC
Engineered Safety Features	ESF
Engineering Change Authorization	ECA
Engineering Change Notice	ECN

Table Rev. 55

Table 1.8-2

ACRONYMS

NAME	ABBREVIATION
Environmental Protection Plan	EPP
Environmental Report – Operating License Stage	ER-OL
Equivalent Full Power Years	EFPY
Excess Flow Check Valve	EFCV
Extended Load Line Limit Analysis	ELLA
Feedwater Controller Failure	FWCF
Field Deviation Disposition Request	FDDR
Final Environmental Statement	FES
Final Safety Analysis Report	FSAR
Framatome ANP, Inc.	FANP or FRA-ANP
Fuel Pool Cooling and Cleanup	FPCC
Fuel Handling Accident	FHA
Full Arc (Mode of TCV Operation)	FA
Full-Length Emergency Cooling Heat Transfer	FLECHT
Functional Control Diagram	FCD
General Electric Company	GE
Heat Exchanger	HX
Heating and Ventilating	H&V
Heating Ventilating and Air-Conditioning	HVAC
High Efficiency Particulate Air-Filter	HEPA
High Energy Line Break	HELB
High Pressure Coolant Injection	HPCI
Hydraulic Control Unit	HCU
Increased Core Flow	ICF
Instrument Data Sheet	IDS
Institute of Electrical and Electronics Engineers	IEEE
Instrument Society of America	ISA
Insulated Power Cable Engineers Association	IPCEA
Interim Acceptance Criteria (NRC)	IAC
Intermediate Range Monitor	IRM
Leakage Control System	LCS
Leak Detection System	LDS
Limiting Condition of Operation	LCO
Limiting Safety System Setting	LSSS
Liner Heat Generation Rate	LHGR
Local Power Range Monitor	LPRM
Loss-Of-Coolant Accident	LOCA
Loss of Offsite Power	LOOP
Low Pressure Coolant Injection	LPCI
Low Population Zone	LPZ
Magnetic Particle Test	MT
Main Steam Isolation Valve	MSIV

Table Rev. 55

Table 1.8-2

ACRONYMS

NAME	ABBREVIATION
Main Steam Isolation Valve Leakage Control System	MSIV-LCS
Main Steam Line	MSL
Main Steam Line Break (Accident)	MSLB or MSLBA
Manufacturers Standardization Society	MSS
Maximum Average Planar Linear Heat Generation Rate	MAPLHGR
Mean Low Water Datum	MLD
Mean Sea Level	MSL
Minimum Critical Heat Flux Ratio	MCHFR
Minimum Critical Power Ratio	MCPR
Moderate Energy Line Break	MELB
Motor Control Center	MCC
Motor-Generator Set	MG
National Electrical Manufacturers Association	NEMA
Neutron-Monitoring System	NMS
Nil Ductility Transition Temperature	NDTT
Nondestructive Examination	NDE
Nondestructive Testing	NDT
North	N
Nuclear Boiler	NB
Nuclear Boiler Rated (power)	NBR
Nuclear Energy Division (GE)	GED
Nuclear Measurement Analysis and Control	NUMAC
Nuclear Regulatory Commission	NRC
Nuclear Safety Operational Analysis	NSOA
Nuclear Steam Supply Shutoff System	NSSSS
Nuclear Steam Supply System	NSSS
Operating Basis Earthquake	OBE
Operating Limit Minimum Critical Power Ratio	OLMCPR
Operator Display Assembly	ODA
Oscillation Power Range Monitor	OPRM
Peak Cladding Temperature	PCT
Pennsylvania Power and Light co.	PP&L
Piping and Instrumentation Diagram	P&ID
Plant Vent Stack	PVS
Power Range Neutron Monitor	PRNM
Preconditioning Cladding Interim Operating Management Recommendation	PCIOMR
Preliminary Safety Analysis Report	PSAR
Primary Containment and Reactor Vessel Isolation Control System	PCRVICS
Probable Maximum Flood	PMF
Process Computer System	PCS
Public Address System	PA
Quality Assurance	QA

Table Rev. 55

Table 1.8-2

ACRONYMS

NAME	ABBREVIATION
Quality Control	QC
Radiographic Test	RT
Reactor Coolant Pressure Boundary	RCPB
Reactor Core Isolation Cooling	RCIC
Reactor Manual Control	RMC
Reactor Pressure Vessel	RPV
Reactor Protection System	RPS
Reactor System Outline	RSO
Reactor Water Cleanup	RWCU
Recirculation Flow Controller Failure	RFCF
Regulatory Guide (NRC) (formerly Safety Guide)	RG
Residual Heat Removal	RHR
Rod Block Monitor	RBM
Rod Sequence Control System	RSCS
Rod Position Information System	RPIS
Rod Withdrawal Error	RWE
Rod Worth Minimizer	RWM
Safe Shutdown	SS
Safe Shutdown Earthquake	SSE
Safety Analysis Report	SAR
Siemens Westinghouse Power Corporation	SWPC
Single-Loop Operation	SLO
Safety/Relief Valve	SRV
Safety Limit Minimum Critical Power Ratio	SLMCPR
Seismic Category I or II	SC I or II
Service Water	SW
Source Range Monitor	SRM
South	S
Standby Gas Treatment System	SGTS
Standby Liquid Control	SLC
Station Black Out	SBO
Traversing Incore Probe	TIP
Turbine Control Valve	TCV
Turbine-Generator	TG
Turbine Trip Without Bypass	TTWOB
Ultimate Heat Sink (Spray Pond)	UHS
Ultrasonic Testing	UT
Valves Wide Open	VWO
West	W

TABLE 1.8-3

Sheet 1 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
absolute	abs
absolute ampere	abamp
actual cubic feet per minute	acfm
alternating current	ac
altitude	alt
ampere(s)	A
ampere-hour(s)	A-hr
ampere per square centimeter	A/cm^2
angstroms	Å
antilogarithm	$\log^{-1}$, antilog
approximately	≈ or approx
asymmetrical	asym
atmosphere	atm
atomic mass unit	amu
atomic number	at. no.
atomic percent	at. %
atomic weight	at. wt.
atomic weight unit	awu
audio-frequency	af
average	avg
bar(s)	bar
barns	b
barrel(s)	bbl
Baume	Be
billion electron volts	BeV
biot(s)	Bi
body centered cubic	bcc
boiling point	bp
brake horsepower	bhp
Brinell hardness number	Bhn
British thermal unit	Btu
calculated	calc
calorie(s)	cal
candela(s)	cd
candlepower	cp
Celsius (centigrade)	°C
cent(s)	¢
centigram	cg
centimeter(s)	cm
centimeter-gram-second	cgs

TABLE 1.8-3

Sheet 2 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
centimeters per second	cm/sec
centipoise	cP
chemically pure	cp
coefficient	coef
cologarithm	colog
concentrated	conc
constant	const
cosecant	csc
cosine	cos
contangent	cot
coulomb(s)	C
counts per minute	cpm
cubic	cu
cubic centimeter(s)	cc or cm^3
cubic feet per minute	cfm
cubic feet per second	cfs
cubic foot (feet)	cu ft or ft^3
cubic inches	cu in. or $in.^3$
cubic meter	m^3
cubic micron(3)	cu, or u^3
cubic millimeter(s)	cu mm, or mm^3
cubic yard	cu yd or ^{3}
Curies	Ci
curies per minute	Ci/min
curies per second	Ci/sec
cycles per second (hertz electronics)	c/s (hz)
cylinder	cyl
day	day
debye(s)	D
decibel(s)	dB
degree(s)	deg or °
degree Baume	°B
degree Celsius (centigrade)	°C
degree Fahrenheit	°F
degree Kelvin (absolute)	°K
decimeter(s)	dm
departure from nucleate boiling	DNB
diameter	diam
diamond pyramid hardness	DPH

TABLE 1.8-3

Sheet 3 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
direct current	dc
disintegration(s)	dis
disintegrations per minute	dpm
disintegrations per second	dps
dollar(s)	$(eg, $15)
dyne(s)	dyn
electromagnetic force	emf
electromagnetic unit	emu
electron volt(s)	eV
electrostatic units	esu
entropy units	eu
equation(s)	Eq, Eqs
equivalent	equiv
erg(s)	erg
exponential	exp
exponential integral	Ei
Fahrenheit	°F
farad(s)	F
feet (foot)	ft
feet per minute	fpm
feet per second	fps
fermi (=10^{-13}cm)	F
figure	Fig.
foot-candle	ft-c
foot-lambert	ft-L
foot-pound	ft-lb
franklin(s)	Fr
frequency modulation	FM
gallon(s)	gal
gallons per minute	gpm
gallons per second	gps
gallons per hour	gph
gauss	G
gilbert(s)	Gi
gram(s)	g
gram-calorie	g-cal
gram-molecular volume	gmv
grams per liter	g/liter
henry (-ies)	H
hertz (cycle per second)	Hz

TABLE 1.8-3

Sheet 4 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
high frequency	hf
high voltage	hv
horsepower	hp
hours(s)	hr
hydrogen ion concentration, negative logarithm of	pH
hyperbolic cosecant	csch
hyperbolic cosine	cosh
hyperbolic cotangent	coth
hyperbolic sine	sinh
inch(es)	in.
inches of mercury	in. Hg
inches of water	in. H2O
inch-pound	in.-lb
inside diameter	ID
integrated neutron flux	nvt
intermediate frequency	i.f.
international angstrom	IA
joule(s)	J
kelvin	°K
kilocalorie(s)	kcal
kilocurie	kCi
kilocycle	kc
kilocycles per second	kc/sec
kiloelectron volt(s)	keV
kilogauss	kG
kilogram(s)	kg
kilogram meter	kg-M
kilogram-weight	kg-wt
kilohm(s)	K
kilojoule(s)	kJ
kiloliter(s)	kl
kilometer(s)	km
kilo-oersted	kOe
kilovolt(s)	kV
kilovolt-ampere(s)	kVa
kilowatt(s)	kW
kilowatt-hour(s)	kWh
kinetic energy	KE or T
Knopp Hardness Number (microhardness)	KHN

TABLE 1.8-3

Sheet 5 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
laboratory	lab
lambert	L
limit	lim
liter(s)	liters or l
logarithm (common)	log
logarithm (natural)	ln or log
lumen	lm
lumens per watt	lm/W
lux	lx
magnetomotive force	mmf
magnified 50 times	50X
maximum	max
maxwell(s)	Mx
megacycle(s)	Mc
megacycles per second	Mcps
megacycles per second (electronics)	MHz
megacycles per second (mechanics)	Mcps
megavolts	MV
megawatts	MW
megawatt-day(s)	MWd
megawatt-electric	MW(e)
megawatt-hour(s)	MWh
megawatt-second(s)	MWs
megawatt-year(s)	MWy
megawatt-thermal	MW(t)
megohm(s)	M
melting point	mp
meter(s)	m
meter-kilogram second	mks
mho	mho.
microampere(s)	μA
microangstrom	μÅ
microbar	μbar
microbarn(s)	μb
microcoulomb(s)	μC
microcuries	μCi
microgram	μg
microfarad	μF
microhenry	μH
microinch	μin.

TABLE 1.8-3

Sheet 6 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
micromicrons	μμ
micromole	μM
micron(s)	
microsecond	μsec
microvolt(s)	μV
microwatt(s)	μW
mile	mi
miles per hour	mph
millicurie(s)	mCi
milligauss	mG
milligram	mg
milligrams per decimeter per day	mdd
millihenry	mH
milliliter(s)	ml
milli-mass-unit	mmu
millimeter	mm
millimicron(s)	m
millimole(s)	mM
million electron volts	MeV
million volts	mV
milliroentgen per hour	mR/hr
millisecond(s)	msec
millivolt(s)	MV
minimum	min
minute(s)	min
molal	molal
molar	M
mole	mole
mole percent	mole %
molecular weight	mol. wt
month	mo
nanocuries	nCi
nanoseconds	nsec
neper(s)	Np
net positive suction head	NPSH
neutron flux	nv
neutrons per volume time	nvt
neutrons per square centimeter per second	n/cm²-sec
newton(s)	N

TABLE 1.8-3

Sheet 7 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
normal	N
nuclear magnetron	nm
number	No.
oersted	Oe
ohm(s)	ohm or
ounce(s)	oz
outside diameter	OD
page	p
pages	pp
parts per billion	ppb
parts per million	ppm
percent	%
percent milli-k	pcm
picofarad(s)	pF
poise	P
potential difference	PD
potential energy	PE or V
pound	lb
pounds per square inch	psi
pounds per square inch absolute	psia
pounds per square inch differential	psid
pounds per square inch gauge	psig
pressure (millimeter of mercury)	mm Hg
probable error	pe
radian	rad
rad	rad
Radiation Protection Guide	RPG
Radioactivity Concentration Guide	RCG
Rankins (degree)	°R
revolutions per minute	rpm
revolutions per second	rps
roentgen(s)	R
roentgen equivalent man	Rem
root mean square	rms
secant	sec
second(s)	sec
Section	Sec.
sine	sin
specific gravity	sp gr
square	sq

TABLE 1.8-3

Sheet 8 of 8

TECHNICAL ABBREVIATIONS

Word	Abbreviation
square centimeters	cm^2
square foot	ft^2
square inch(es)	$in.^2$
square kilometer(s)	km^2
square meter(s)	m^2
square micron(s)	μ^2
square millimeter(s)	mm^2
stainless steel	ss
standard	std
standard temperature and pressure	STP
steradian	sr
tangent	tan
temperature	temp
tensile yield strength	tys
tesla (Wb/m^2)	T
thousand circular mills	kcmil
thousand electron volts	keV
trace	Tr
transpose	tr
ultimate tensile strength	uts
ultraviolet	uv
velocity	v
versus	vs
volt(s)	V
volume	vol
volume parts per million	vpm
water gage	wg
watt(s)	W
weber	Wb
weight	wt
weight percent	wt%
x units	xu
yard(s)	yd
year(s)	yr

TABLE 1.8-5

Sheet 1 of 9

DRAWING ABBREVIATIONS

Abbreviation	Description
A	AMBER, AMMETER, AMPERE
AC	ALTERNATING CURRENT
ACB	AIR CIRCUIT BREAKER
AIR COND	AIR CONDITIONING UNIT
AL	ALARM OR ALUMINUM
AMP	AMPLIFIER OR AMPERE
ANALY	ANALYZER
ANNUN	ANNUNCIATOR
AO	AIR OPERATED
APPROX	APPROXIMATE
AR	ALARM RELAY
ARM	ARMATURE
ARR	ARRESTER OR ARRANGE
ASSY	ASSEMBLY
A/T	AMPERE TRANSDUCER
AUTO	AUTOMATIC
AUTO TRANS	AUTO TRANSFORMER
AUX	AUXILIARY
AVG	AVERAGING OR AVERAGE
AWG	AMERICAN WIRE GAUGE
BAR	BARRIER
BAT	BATTERY
BCT	BUSHING CURRENT TRANSFORMER
BD	BOARD
BDD	BACK DRAFT DAMPER
BIL	BASIC IMPULSE INSULATION LEVEL
BKR	BREAKER
BLDG	BUILDING
BLO	BLOWER
BLR	BOILER
B/M	BILL OF MATERIAL
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BRG	BEARING
BSTR	BOOSTER
BYP	BYPASS
CAB	CABINET
CAP	CAPACITOR OR CAPACITY

DRAWING ABBREVIATIONS

Abbreviation	Description
CAS	CASING
CAUS	CAUSTIC
CAV	CAVITY
CB	CONTROL BOARD
CC	CONTROL CABINET OR COOLING COIL
CE	CONDUCTIVITY CELL
CH	CONTROL HOUSE (SWITCHYARD)
CHEM	CHEMICAL
CHG	CHANGE OR CHARGER, CHARGING
CHLOP	CHLORINATOR OR CHLORINE
CHW	CHILLED WATER
CIRC	CIRCULATING
CKT	CIRCUIT
CL	CENTER LINE
CLR	COOLER
CND	CONDUIT
CNDS	CONDENSATE
COL	COLUMN
COMM	COMMUNICATION OR COMMON
COMP	COMPUTER, COMPONENT
CON	CONSOLE
COND	CONDENSER OR CONDUCTOR
CONT	CONTROL
CONTC	CONTRACTOR
CONTD	CONTINUED
COOL	COOLING
CR	CONTROL ROOM
CS	CONTROL SWITCH OR CONTROL STATION
CTR	CENTER
CUB	CUBICLE
CW	COOLING WATER, CIRCULATING WATER, OR CLOCKWISE
CENTRIF	CENTRIFUGAL
CONTAIN	CONTAINMENT
COMPR	COMPRESSOR
CCW	COMPONENT COOLING WATER
CNCT	CONCENTRATE
DB	DRY BULB
DC	DIRECT CURRENT
DEMIN	DEMINERALIZER

TABLE 1.8-5

Sheet 3 of 9

DRAWING ABBREVIATIONS

Abbreviation	Description
DET	DETECTOR
DIAG	DIAGRAM
DIA	DIAMETER
DIFF	DIFFERENTIAL
DISC	DISCONNECT
DISCH	DISCHARGE
DIST	DISTRIBUTION
DP	DIFFERENTIAL PRESSURE OR DEW POINT
DR	DRIVE
DRN	DRAIN
DWG	DRAWING
E/P	ELECTRO TO PNEUMATIC TRANSDUCER
EL	ELEVATION
ELEC	ELECTRIC OR ELECTRICAL
EMER	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINE
ENT	ENTERING
EQUIP	EQUIPMENT
EXC	EXCITER OR EXCITATION
EXH	EXHAUST
EXHTR	EXHAUSTER
EXT	EXTRACTOR
EXTN	EXTRACTION
ENCL	ENCLOSURE
ESF	ENGINEERED SAFETY FEATURES
F	FLOW
FC	FAIL CLOSED
FD	FIRE DAMPER
FDR	FEEDER
FIG	FIGURE
FIL	FILTER
FL	FLAME
FLEX	FLEXIBLE
FLD	FIELD
FO	FAIL OPEN
F/T	FREQUENCY TRANSDUCER
FW	FEEDWATER

DRAWING ABBREVIATIONS

Abbreviation	Description
FS	FLOW SWITCH
G	GREEN
GEN	GENERATOR
GOV	GOVERNOR
GR	GEAR
GRD	GROUND
GS	GLAND SEAL
GSS	GLAND SEAL STEAM
GUI	GUIDE
H	HYDROGEN
H&V	HEATING AND VENTILATION UNIT
HI	HIGH
HP	HIGH PRESSURE OR HORSEPOWER OR HIGH POINT
HSE	HOUSE
HT	HEAT TRACING
HTR	HEATER
HV	HIGH VOLTAGE
HWC	HOT WATER CIRCULATION
HYD	HYDRAULIC
HYDZ	HYDRAZINE
HTG	HEATING
HVAC	HEATING, VENTILATING & AIR CONDITIONING
IN	INLET, INPUT, OR INTAKE
INC	INCOMING
IND	INDICATOR
INST	INSTRUMENT
INV	INVERTER
IP	INTERMEDIATE PRESSURE
ISO	ISOLATION OR ISOLATED
ITL	INTERLOCK
JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT-AMPERE
KV	KILOVOLT
KW	KILOWATT

TABLE 1.8-5

DRAWING ABBREVIATIONS

Abbreviation	Description
L	LEFT OR LEVEL
LA	LIGHTNING ARRESTER
LAB	LABORATORY
LAL	LEVEL ALARM, LOW
LC	LOAD CENTER
LCS	LOCAL CONTROL STATION
LIM	LIMIT
LIQ	LIQUID
LO	LUBRICATION OIL, LOW, OR LOCKOUT
LP	LOW PRESSURE
LS	LEVEL SWITCH OR LIMIT SWITCH
LTG	LIGHTING
LVG	LEAVING
M	MAIN
MACH	MACHINE
MAN	MANUAL
MISC	MISCELLANEOUS
MCC	MOTOR CONTROL CENTER
MECH	MECHANIC OR MECHANICAL
MFR	MANUFACTURE OR MANUFACTURER
MG OR M-G	MOTOR-GENERATOR
MH	MAN HOLE
MISC	MISCELLANEOUS
MO	MOTOR OPERATED
MOV	MOTOR OPERATED VANE OR VALVE
MS	MAIN STEAM
MT	MAIN TRANSFORMER
MTR	MOTOR OR METER
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NESF	NON-ENGINEERED SAFETY FEATURES
NEUT	NEUTRAL
NO	NUMBER OR NORMALLY OPEN
NORM	NORMAL
NP	NAME PLATE
NEG	NEGATIVE
NPS	NEGATIVE PHASE SEQUENCE

DRAWING ABBREVIATIONS

Abbreviation	Description
O	OXYGEN
OC	OVERCURRENT
OCB	OIL CIRCUIT BREAKER
OL	OVERLOAD
OUT	OUTLET OR OUTPUT
P	PRESSURE
PAL	PRESSURE ALARM LOW
PB	PULL BOX OR PUSHBUTTON
PH	PHASE
PMG	PERMANENT MAGNET GENERATOR
PNL	PANEL
PO	POSITION OR POSITIONER
POS	POSITION SWITCH OR POSITIVE
PP	PUMP
PRESS	PRESSURE
PS	PRESSURE SWITCH
PT	POTENTIAL TRANSFORMER OR PRESSURE TRANSMITTER
PWR	POWER
POT	POTENTIAL
PW	PILOT WIRE
R	RIGHT OR RED
RAD	RADIATION
RE	ROOF EXHAUSTER OR RADIATION ELEMENT
REACT	REACTOR
REC	RECEIVER
RECIRC	RECIRCULATION OR RECIRCULATING
RECP	RECEPTACLE
RECT	RECTIFIER
REG	REGULATOR
REF	REFERENCE
RH	REHEAT OR RELATIVE HUMIDITY
RHEO	RHEOSTAT
RHTR	REHEATER
RLY	RELAY
RM	ROOM
RR	RAILROAD
RS	REVERSING STARTER

DRAWING ABBREVIATIONS

Abbreviation	Description
RTD	RESISTANCE TEMPERATURE DETECTOR
RECIP	RECIPROCATOR OR RECIPROCATING
RHR	RESIDUAL HEAT REMOVAL
SAMP	SAMPLING
SCAV	SCAVENGING
SCHEM	SCHEMATIC
SCRN	SCREEN
SD	STEAM LOAD DRAIN OR DUMP VALVE
SEC	SECONDARY
SECT	SECTION
SEL	SELECTOR
SEP	SEPARATOR
SERV	SERVICE
SEW	SEWAGE
SFT	SHAFT
SH	SUPERHEATER
SHLD	SHIELD
SI	SEAL IN RELAY OR CONTACT
SIG	SIGNAL
SL	SEAL
SO	SEAL OIL
SP	SPEED OR SPARE
STM	STEAM
STA	STATION
STBY	STANDBY
STD	STANDARD
STG	STORAGE
STR	STARTER
STUP	STARTUP
SUBSTA	SUBSTATION
SUCT	SUCTION
SUPHTR	SUPERHEATER
SUPT	SUPPORT
SV	SOLENOID VALVE
SW	SWITCH OR SERVICE WATER
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYN	SYNCHRONOUS, SYCHRONIZING OR SYNCHRONISM
SWYD	SWITCHYARD (ie, SWITCHING STATION)

TABLE 1.8-5

Sheet 8 of 9

DRAWING ABBREVIATIONS

Abbreviation	Description
SYS	SYSTEM
SS	STARTUP SOURCES
SHED	SHEDDING
T	TEMPERATURE, TRANSDUCER OR TRANSMITTER
TAL	TEMPERATURE ALARM
TACH	TACHOMETER
TB	TERMINAL BOX
TC	THERMOCOUPLE OR TRIP COIL
TD	TIME DELAY
TDC	TIME DELAY (TIME DELAY TO CLOSE)
TDD	TIME DELAY (ON DEENERGIZING)
TDE	TIME DELAY (ON ENERGIZING)
TDO	TIME DELAY (TIME DELAY TO OPEN)
TE	THERMAL ELEMENT
TEL	TELEPHONE
TEMP	TEMPERATURE OR TEMPORARY
TERM	TERMINAL
THERMO	THERMOSTAT
THROT	THROTTLE
TG OR T-G	TURNING GEAR OR TURBINE-GENERATOR
TK	TANK
TOS	TORQUE SWITCH
TRAV	TRAVELING
TRANS	TRANSFER OR TRANSFORMER
TS	TEMPERATURE SWITCH OR TEST SWITCH
TURB	TURBINE
TYP	TYPICAL
TV	TELEVISION (RECEIVER)
TVC	TELEVISION CAMERA (TRANSMITTER)
UP	UPSTREAM OR UPPER
UV	UNDERVOLTAGE
UF	UNDERFREQUENCY
V	VOLT, VOLTAGE, VOLTMETER OR VALVE
VAC	VACUUM
VAP	VAPOR
VB	VIBROMETER
VENT	VENTILATION

DRAWING ABBREVIATIONS

Abbreviation	Description
VERT	VERTICAL
V/T	VOLT TRANSDUCER
W	WEST, WHITE, OR WATTMETER
WB	WET BULB
WHSE	WAREHOUSE
WP	WEATHERPROOF
W/T	WATT TRANSDUCER
WTR	WATER

TABLE 1.8-6

Sheet 1 of 2

PIPING AND VALVE CLASS IDENTIFICATION

Pipe and valve classes are designated by a three-letter code. The first letter indicates the primary valve and flange pressure rating; the second letter, the type of material; and the third letter, the code to which the piping is designed.

FIRST LETTER - PRIMARY PRESSURE RATING

Unless otherwise noted, all ratings are in accordance with ANSI B16.5 (NOTE 7)

A - Specific pressure @ specific temperature
B - 2500#
C - 1500#
D - 900#
E - 600#
F - 400#
G - 300#
H - 150#
J - 125# ANSI B16.1
K - 175# WOG Underwriters' Laboratories, Inc.
L - 250# ANSI B16.1
X - Gravity rating
Y - General use as designated on piping class sheets.

Additional pressure ratings for valves:

M - 200# (manufacturer's rating)
N - 150# WOG
P - 100# (manufacturer's rating)
R - 75# (manufacturer's rating)
S - 50# WOG
T - 25# AWWA (or manufacturer's rating)
Z - General use as designated on piping class sheets.

SECOND LETTER - MATERIAL

A - Alloy Steel
B - Carbon Steel
C - Austenitic Stainless Steel
D - Copper, Brass or Bronze
E - Copper-Nickel
F - Carbon Steel - Copper Bearing
G - Carbon Steel - Lined
H - Cast Iron

TABLE 1.8-6

Sheet 2 of 2

J - Concrete
K - Vitrified Clay
L - Carbon Steel - Impact Tested
M - Cast Iron - High Silicon
N - Carbon Steel - Galvanized
P - Cast Iron - Cement Lined
Q - Asbestos-Cement
R - Carbon Steel-(RHR, Service Water & ES Water Systems)

THIRD LETTER - APPLICABLE CODES

A - Nuclear Power Plant Components, ASME B&PV Code, Sect. III, Class 1
B - Nuclear Power Plant Components, ASME B&PV Code, Sect. III, Class 2
C - Nuclear Power Plant Components, ASME B&PV Code, Sect. III, Class 3
D - Power Piping Code, ANSI B31.1.0
F - National Fire Protection Association Code
G - Uniform Plumbing Code
H - Power Boilers, ASME B&PV Code, Sect. I
J - American Water Works Standards

INSTRUMENT FUNCTION / MEASURED VARIABLE (FIRST LETTER)		CONTROLLING (SECOND AND THIRD LETTER)						MEASURING (SECOND AND THIRD LETTER)												SEE NOTE 3	
		RECORDING	INDICATING	NON-INDICATING	CONTROL VALVE	SUMMER	FUNCTION GENERATOR	RECORDER	INDICATOR	OBSERVATION GLASS	PRIMARY ELEMENT	TEST POINT	TRANSMITTER OR PREAMP	INTEGRATOR	AMPLIFIER	SAMPLER	INDICATING SWITCH	NON-INDICATING SWITCH	ALARMS	TRANSDUCER NON-INDICATING	TRANSDUCER INDICATING
		-RC	-IC	-C	-CV	-Σ	-f	-R	-I	-G	-E	-X	-T	-Q	-Am	-Sm	-IS	-S	-A	-M	-IM
AIR	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ASm	-	-	-	-	-
CONDUCTIVITY	C	CRC	CIC	-	CCV	-	-	CR	CI	-	CE	CX	CT	-	-	CSm	CIS	CS	CA	-	-
DENSITY	D	DRC	DIC	DC	DCV	-	-	DR	DI	-	-	DX	DT	-	-	-	DIS	DS	DA	-	-
DIFF. PRESS.	dP	dPRC	dPIC	dPC	dPCV	-	-	dPR	dPI	-	-	-	dPT	-	-	-	dPIS	dPS	dPA	dPM	dPIM
FLOW	F	FRC	FIC	FC	FCV	FΣ	Ff	FR	FI	FG	FS	FX	FT	FQ	-	-	FIS	FS	FA	FM	FIM
HYDROGEN	H_2	-	-	-	-	-	-	H_2R	H_2I	-	H_2E	-	-	-	-	-	-	-	-	-	-
HYDROGEN ION CONC.	pH	pHRC	pHIC	pHC	pHCV	-	-	pHR	pH1	-	pHE	pHX	-	-	pHAm	pHSm	-	-	-	-	-
LEVEL	L	LRC	LIC	LC	LCV	-	-	LR	LI	LG	-	-	LT	-	-	-	LIS	LS	LA	LM	LIM
MOISTURE	M	MRC	MIC	-	-	-	-	MR	MI	-	ME	-	MT	-	-	-	MIS	MS	-	-	-
NEUTRON FLUX	N	NRC	NIC	NC	-	-	-	NR	NI	-	NE	NX	NT	NQ	NAm	-	-	-	NA	-	-
OXYGEN	O_2	-	-	-	-	-	-	O_2R	O_2I	-	O_2E	-	-	-	-	-	-	-	-	-	-
PRESSURE	P	PRC	PIC	PC	PCV	-	-	PR	PI	-	-	PX	PT	-	-	-	PIS	PS	PA	PM	PIM
POSITION	Po	-	-	-	-	-	-	PoR	PoI	-	-	-	PoT	-	-	-	-	PoS	PoA	-	-
RADIATION	R	-	-	-	-	-	-	RR	RI	-	RE	RX	-	-	RAm	RSM	-	RS	RA	-	-
SPEED	S	SRC	SIC	SC	-	-	-	SR	SI	-	SE	-	-	-	-	-	-	-	-	-	-
TEMPERATURE	T	TRC	TIC	TC	TCV	-	-	TR	TI	-	TE	TX	TT	TQ	-	-	TIS	TS	TA	TM	TIM
TIME	t	-	-	tC	-	-	-	-	tI	-	-	-	-	tQ	-	-	tIS	tS	-	-	-
TURBIDITY	Tb	-	-	-	-	-	-	TbR	-	-	TbE	-	TbT	-	-	-	-	-	-	-	-
VIBRATION	Vb	-	-	-	-	-	-	VbR	VbI	-	-	-	-	-	-	-	-	VbS	VbA	-	-
WEIGHT FACTOR	Wf	WfRC	WfIC	-	WfV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

MISCELLANEOUS ABBREVIATIONS:

ADS	AUTOMATIC DEPRESSURIZATION
A/S	AIR SUPPLY
AW	ACID WASTE (CORROSIVE,CAUSTIC)
C/T	CONDUCTIVITY INDICATOR OR TRANSMITTER
CRD	CONTROL ROD DRIVE
CRDHS	CONTROL ROD DRIVE HYDRAULIC SYSTEM
CRS	CONDUCTIVITY RECORDING SWITCH
CRW	CLEAN RADWASTE
tC	CYCLE TIMER
DRW	DIRTY RADWASTE
dTS	DIFFERENTIAL TEMPERATURE SWITCH
E/P	CONVERTER (VOLTAGE / PNEUMATIC)
E/S	SPECIAL ELECTRIC POWER SUPPLY REQUIRED
F/D	FILTER DEMINERALIZER
FC	INDICATES CLOSES ON AIR OR ELECTRICAL FAILURE
FIT	FLOW INDICATOR TRANSMITTER
FO	INDICATES OPENS ON AIR OR ELECTRICAL FAILURE
FRCS	FLOW RECORDING CONTROLLER SWITCH
HCU	HYDRAULIC CONTROL UNIT
Hx	HEAT EXCHANGER
IP	CONVERTER (CURRENT/PNEUMATIC)
LC	LOCK CLOSED
L/DRS	LEVEL & DENSITY RECORDER SYSTEM
LIM SW	LIMIT SWITCH
LIRS	LEVEL INDICATOR RECORDING SYSTEM
LO	LOCK OPEN
LRS	LEVEL RECORDING SWITCH
MSIV	MAIN STEAM ISOLATION VALVE
MV / I	MILLIVOLT TO CURRENT SYSTEM
NC	NORMALLY CLOSED
ND	NORMALLY DE-ENERGIZED
NE	NORMALLY ENERGIZED
NO	NORMALLY OPEN
NSSS	NUCLEAR STEAM SUPPLY SYSTEM
NW	NORMAL WASTE (CONVENTIONAL)

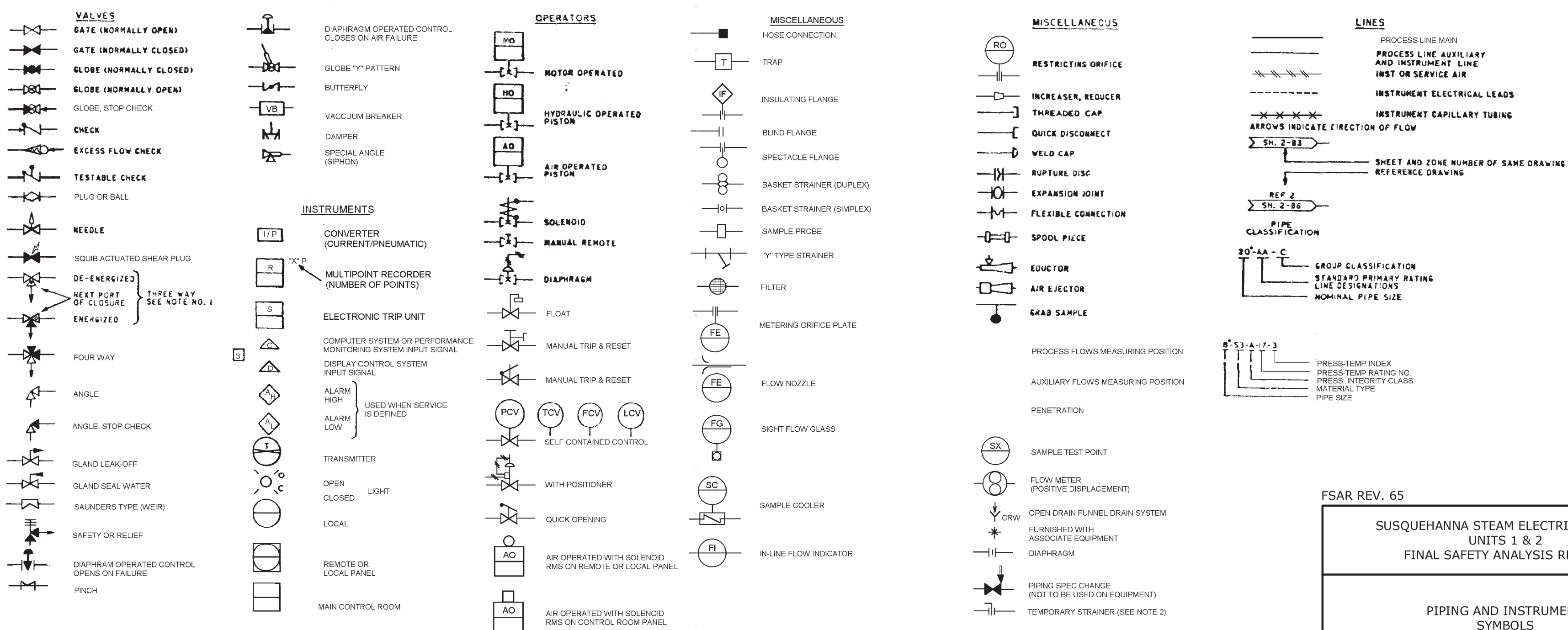
MISCELLANEOUS ABBREVIATIONS:

RBCCW	REACTOR BUILDING CLOSED COOLING WATER
RBEDT	REACTOR BUILDING EQUIPMENT DRAIN TANK
RM	REMOTE MANUAL
RMC	REMOTE MANUAL CONTROL
RMS	REMOTE MANUAL SYSTEM
RPS	REACTOR PROTECTION SYSTEM
RPV	REACTOR PRESSURE VESSEL
SS	SELECTOR SWITCH
SSa	SELECTIVE SWITCH AUTOMATIC
SQ RT OR √	SQUARE ROOT CONVERTOR
TBCCW	TURBINE BUILDING CLOSED COOLING WATER
TBRS	TURBIDITY RECORDER SWITCH
tDS	TIME DELAY SWITCH
TQOS	TORQUE OVERLOAD SWITCH
TQRS	TORQUE RECORDER SWITCH
TQT	TORQUE TRANSMITTER
TRS	TEMPERATURE RECORDER SWITCH
FAI	FAIL AS IS } SEE NOTE 2
HS	HAND SWITCH } SEE NOTE 2

NOTES:

1. ALL SOLENOID VALVES SHOWN IN DE-ENERGIZED POSITION. "NE" - DENOTES SOLENOID IS NORMALLY ENERGIZED DURING PLANT OPERATION.

3. FOR THE TYPE OF TRANSDUCER (SWITCH OR TRANSMITTER) REFER TO THE PARTICULAR SYSTEM MASTER PARTS LIST.



FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

PIPING AND INSTRUMENT SYMBOLS

FIGURE 1.8-1, Rev 54

AutoCAD: Figure Fsar 1_8_1.dwg

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-100, Sh. 1

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.8-2A replaced by dwg. M-100, Sh. 1 FIGURE 1.8-2A, Rev. 55

AutoCAD Figure 1_8_2A.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-100, Sh. 2

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.8-2B replaced by dwg. M-100, Sh. 2 FIGURE 1.8-2B, Rev. 56

AutoCAD Figure 1_8_2B.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-100, Sh. 3

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION
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Figure 1.8-2C replaced by dwg.
M-100, Sh. 3

FIGURE 1.8-2C, Rev. 48

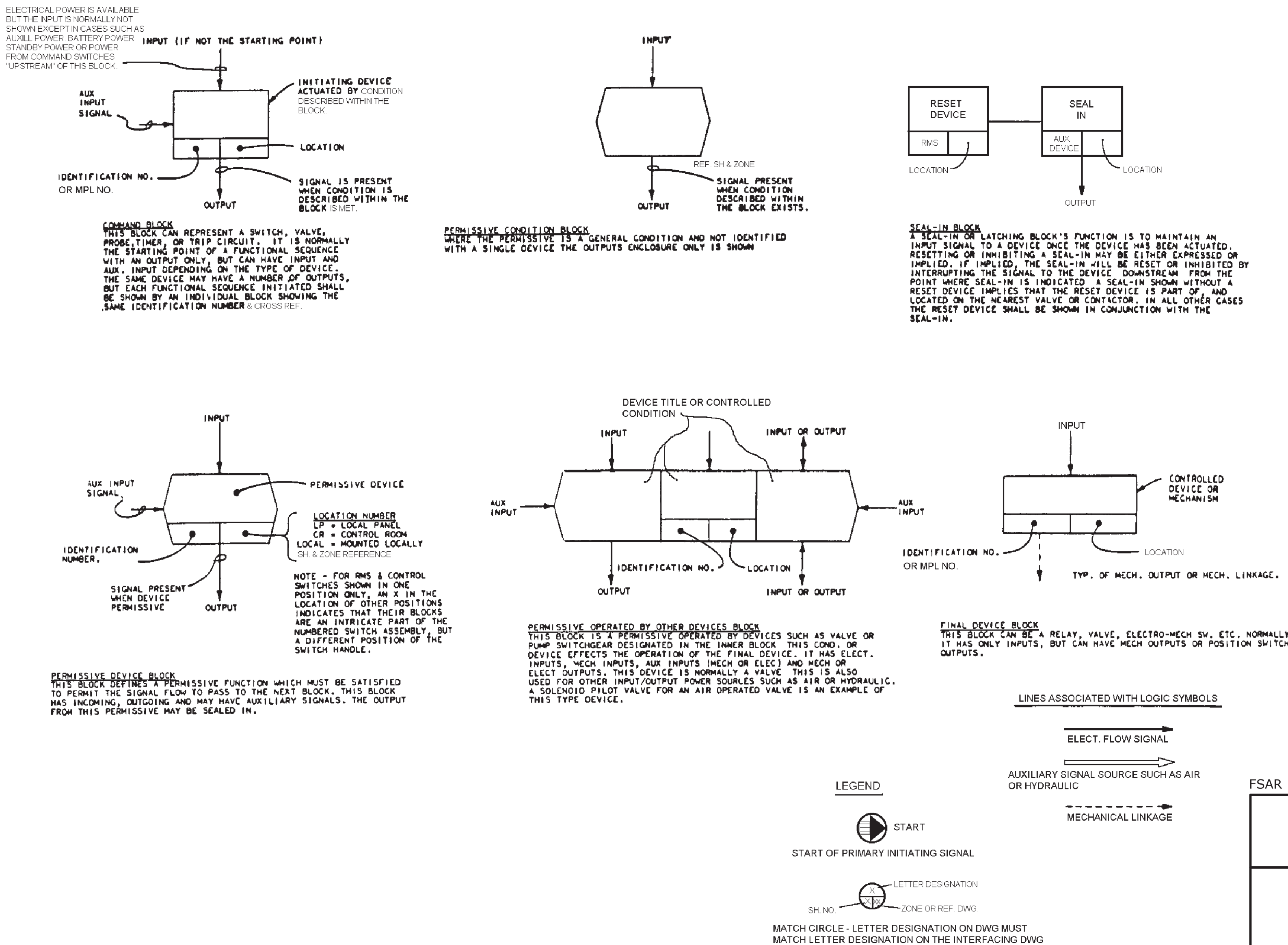
AutoCAD Figure 1_8_2C.doc

THIS FIGURE HAS BEEN
REPLACED BY DWG.
M-100, Sh. 4

FSAR REV. 65

SUSQUEHANNA STEAM ELECTRIC STATION UNITS 1 & 2 FINAL SAFETY ANALYSIS REPORT
Figure 1.8-2D replaced by dwg. M-100, Sh. 4 FIGURE 1.8-2D, Rev. 55

AutoCAD Figure 1_8_2D.doc



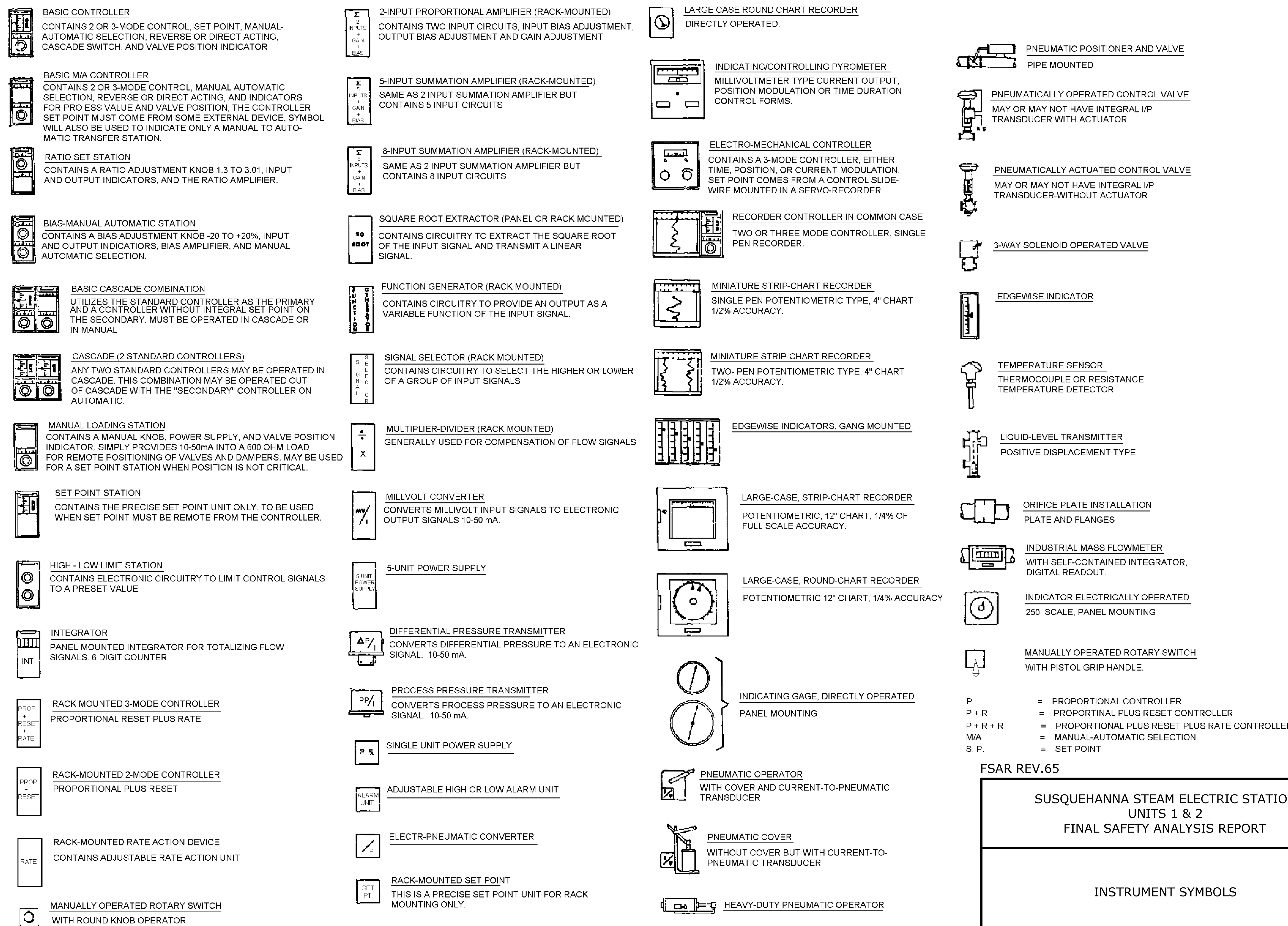
FSAR REV.65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

LOGIC SYMBOLS

FIGURE 1.8-3, Rev 54

AutoCAD: Figure Fsar 1_8-3.dwg



FSAR REV.65

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 & 2
FINAL SAFETY ANALYSIS REPORT

INSTRUMENT SYMBOLS

FIGURE 1.8-4, Rev 54

AutoCAD: Figure Fsar 1_8-4.dwg