COLT DIESEL GENERATOR
SUMMARY
FOR
SHOREHAM NUCLEAR POWER STATION - UNIT 1
LONG ISLAND LIGHTING COMPANY

JUNE, 1984

STONE & WEBSTER ENGINEERING CORPORATION

TABLE OF CONTENTS

SECTION 1

GENERAL DESCRIPTION

Standby ac power for the plant is supplied from three diesel generators. Each of the three generators is arranged for connection to one of three independent and physically separated 4.16-kV switchgears which supply ac power required for a safe shutdown.

Power supplies for essential auxiliaries are arranged so that failure of any single switchgear bus or diesel generator supply unit will not jeopardize proper operation of redundant systems supplied from other switchgear buses. Under this condition, adequate ac power is available for safe shutdown of the plant under all postulated accident conditions.

The location of the Diesel Generator Building is shown on Figure 1-1.

SECTION 2

DIESEL GENERATOR BUILDING

2.1 DESCRIPTION OF STRUCTURE

The Diesel Generator Building (Figures 2-1 and 2-2) is a QA Category I, reinforced concrete structure. It houses three Colt-Pielstick 4430 kW (4150 kW)* diesel generators in three separated rooms. These diesel generators will be used to supply emergency power during a loss of offsite power or a loss of coolant accident, coincident with a loss of offsite power. The building is erected in a low radiation zone area so as to be accessible to authorized personnel at all times.

The building's external dimensions are 110 feet in the N-S direction and 85 feet in the E-W direction. Each room has inside dimensions of approximately 34 feet by 80.5 feet. The one-story building has the air intake and exhaust hoods on the roof at opposite ends of the building. Each diesel generator is located at the center of its room with the longest dimension running in the E-W direction. Openings with removable plugs are provided in the east wall for the installation and removal of the generators. At the west end of the room is the electrical room under which is the cable vault area where the electrical duct banks enter the building. The interior walls between each room provide a 3-hour fire rating isolating each room. The building is watertight to withstand the probable maximum hurricane flood level.

The grade level outside the building is at el 20 feet. The bottom of the foundation is at el 11 feet. The foundation consists of a 6 foot-3 inch thick reinforced concrete mat with the exception of the cable vault area where 3-foot thick footings are used.

The diesel generator foundations are integral with the 6 foot-3 inch thick mat. The top elevation of the diesel generator foundations are at el 21 feet. Surrounding each diesel generator foundation is a pipe trench approximately 4 feet wide and 3 feet deep. The top of the floor slab is at el 20 feet-6 inches. The main roof of the building is at el 53 feet-6 inches, and the roofs for the air intake hood and the exhaust hood are at el 69 feet-6 inches.

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*The ratings shown in parentheses will be indicated on the nameplate to indicate the reduced field testing limits. These reduced ratings exceed the expected maximum coincidental load and are consistent with industry experience which suggests that running diesels below nameplate ratings is desirable.

2.2 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

The codes, specifications, standards, and NRC Regulatory Guides used in establishing design methods, analytical techniques, and material properties for the Diesel Generator Building are listed in FSAR Section 3.8.4.2.

2.3 LOADS AND LOADING COMBINATIONS

The loads and loading combinations used for the design of Diesel Generator Building are specified in FSAR Section 3.8.4.3. In addition, the load combinations and minimum acceptable safety factors used for stability calculations are specified in FSAR Section 3.8.5.5.

2.4 DESIGN AND ANALYSIS PROCEDURES

The Diesel Generator Building is analyzed and designed for the loading combinations as outlined in FSAR Section 3.8.4.3. The determination of the seismic forces is presented in FSAR Section 3.7. The equivalent wind pressure for the design of the structure is presented in FSAR Section 3.3.

2.5 STRUCTURAL ACCEPTANCE CRITERIA

The structural acceptance criteria are given in FSAR Section 3.8.4.5.

2.6 MATERIALS, QUALITY CONTROL, SPECIAL CONSTRUCTOR TECHNIQUES, AND QUALITY ASSURANCE

Materials, quality control, special construction techniques, and quality assurance requirements for the Diesel Generator Building are described in FSAR Section 3.8.4.6 with the following exceptions:

1. Reinforcing bars No. 3 through and including No. 6 conform to the requirement of ASTM A615, Grade 40. Reinforcing bars No. 7 through and including No. 11 conform to the requirements of ASTM A615, Grade 60.

2. Water stops are provided in all horizontal and vertical construction joints up to el 30 feet-0 inch with the exception of the north wall where they are provided up to el 43 feet-5 inches, consistent with the FSAR which addresses protection from a probable maximum hurricane.

SECTION 3

ELECTRICAL DESCRIPTION

3.1 RATING

The onsite standby power facilities consist of three identical diesel generator units. Each unit is rated as follows:

Voltage, V	4160	
Rpm	514	
Frequency, Hz	60	
Power factor	0.8	
Continuous 8760 hour kW rating	4430	(4150)*
Short-time kW rating (2 hours in 24)	4873	(4430)*

3.2 SIZING CRITERIA

The criteria used to size the diesel generators are:

1. Any two diesel generators are capable of meeting the maximum demand caused by a loss of cooling accident and any other design basis event.

2. The continuous 8760-hour reduced rating (4150 kW) of each diesel generator exceeds the maximum coincidental load.

3. Each diesel generator is capable of starting, accelerating, and accepting in the required sequence all of its engineered safety features and emergency shutdown loads.

Sizing of the diesel generators is consistent with Regulatory Guide 1.9.

3.3 LOADING CONDITIONS

The estimated maximum coincident demand is 3949 kW.** This demand will occur on DG 903 within 10 minutes after a loss of coolant accident coincidental with a loss of offsite power.

The estimated maximum continuous load is 3582 kW**. This load will occur on DG 901 following a loss of coolant accident coincidental with a loss of offsite power supplies.

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*The rating shown in parentheses will be indicated on the nameplate to show the values to be used for periodic testing. These reduced rating exceed the expected maximum coincident load.

**Colt DG installation (HVAC, for example) results in a somewhat higher maximum calculated coincidental and continuous electrical loads than the present FSAR values.

DG 902 is enveloped for the maximum coincident demand and the maximum continuous load by DG 903 and DG 901 respectively as indicated above.

3.4 STARTING

Each diesel engine has redundant, independent air-start systems. Engine cranking is accomplished by appropriate sequencing of air to the pistons from two stored air supplies. Each redundant system has sufficient capacity to start the engine at least five times without recharging from the air compressor. Fast starting and loading are facilitated by heaters which maintain the diesel engine in a warm condition.

On failure of offsite power, each diesel generator starts and, upon reaching a pre-set speed and voltage, connects to its respective 4160 V bus automatically. All engineered safety features and emergency shutdown loads, if required, are then automatically applied in the proper sequence.

On high drywell pressure or low reactor water level, each diesel generator automatically starts but remains disconnected from its respective bus if offsite power is available.

For testing purposes, each unit is provided with synchronizing equipment to allow manual startup synchronizing and loading onto a live bus.

The loading sequence of each unit is designed in a manner that will prevent system instability during the period of load application. A fast responding exciter and a voltage regulator ensure quick voltage recovery after any load addition.

3.5 TRIPPING SYSTEM

Each diesel generator is equipped with protective relays which will shut the unit down automatically in the event of unit faults. During operation under emergency conditions, trip conditions are limited to those which, if allowed to continue, would rapidly result in the loss of the diesel generator. Each diesel generator is tripped automatically under the following conditions:

	Function	Trip: Normal/Loss-of Power/Test	Trip: LOCA
1.	Reverse power	X	
2.	Loss of excitation	X	
3.	Overcurrent - voltage restrained	X	X
4.	Generator differential	X	X
5.	Lube oil low pressure (2 out of 3 trip logic)	X	X
6.	Overspeed	X	X

3.6 SURVEILLANCE

Surveillance instrumentation is provided to monitor the status of each diesel generator. Provisions for surveillance are an essential requirement in the design, manufacture, installation, testing, operation, and maintenance of these diesel generators. Such surveillance not only provides continuous monitoring of the status of the diesel generators so as to indicate their readiness to perform their intended function, but also serves to facilitate testing and maintenance of the equipment. Conditions which can adversely affect performance of the diesel generators are annunciated locally and in the main control room. The following list shows the important functions that are annunciated:

Function	Alarm	
	Local*	Control Room
Fuel oil day tank level low	X	
Fuel oil day tank level high	X	
Fuel oil transfer system not in auto	X	
Fuel oil transfer pump 201 locked out	X	
Fuel oil transfer pump 202 locked out	X	
Standby fuel oil pump running	X	
Fuel oil storage tank No. 1 level low	X	
Fuel oil storage tank No. 2 level low	X	
Fuel oil pressure low	X	
Fuel oil filter differential pressure high	X	
Annunciator ground	X	
Fuel oil strainer differential pressure high	X	
Lube oil pressure low pre-trip	X	

*All local alarms annunciate in the Main Control Room on a Common DG Trouble alarm.

Function	Alarm	Control
	Local*	Room
Crankcase lube oil level low	X	
Lube oil temperature high	X	
Lube oil pressure low shutdown	X	X
Lube oil makeup tank level low	X	
Lube oil temperature low	X	
Lube oil keep warm temperature low	X	
Lube oil keep warm temperature high	X	
Crankcase lube oil level high	X	
Rocker arm lube oil pressure low	X	
Rocker arm lube oil tank level high	X	
Crankcase pressure high	X	
Lube oil filter differential pressure high	X	
Lube oil strainer differential pressure high	X	
Jacket water expansion tank level low	X	
Jacket water temperature low	X	
Jacket water-keep warm temperature low	X	
Jacket water pressure low	X	
Jacket water expansion tank level high	X	
Jacket water expansion tank filling	X	
Jacket water temperature high	X	
Jacket water keep warm temperature high	X	
Service water flow low	X	
Intercooler water pressure low	X	
Intercooler water temperature high	X	

Function	Alarm	
	Local*	Control Room
Generator space heater loss of control power	X	
Diesel unit not available	X	
Emergency stop actuated	X	
Starting air pressure low	X	
Start failure	X	
Combustion air temperature high	X	
Diesel engine in local control	X	
Loss of ac power	X	
Voltage regulator power failure	X	X
Governor PT fuse blown	X	
Diesel engine overspeed	X	X
Diesel engine locked out for maintenance	X	
Loss of dc power	X	
Any control switch not in auto	X	
Voltage regulator PT fuse blown	X	
Diesel system inoperative		X
Diesel engine trouble (reflashed)		X
Diesel system degraded		X
Diesel main control board disabled		X

SECTION 4
DIESEL GENERATOR AUXILIARY SYSTEMS

4.1 APPLICABLE CODES, STANDARDS, AND SPECIFICATIONS

Installation of safety-related piping systems will be accomplished in accordance with ASME Section XI, 1980 Edition, Winter 1981 Addendum and applicable specifications as part of the station modification program. These Colt diesels are replacements for the original TDI diesel emergency power system which already had been completely installed, N-5 certified, and operated.

4.2 DIESEL GENERATOR FUEL OIL STORAGE AND TRANSFER SYSTEM

4.2.1 Design Bases

The three diesel engines operate on No. 2 fuel oil. Each engine is supplied by a separate diesel generator fuel oil storage and transfer system design to allow for 7 days of continuous operation of the diesel engine at rated load. All safety-related portions of the diesel generator fuel oil storage and transfer systems are designed to ASME III, Code Class 3 and Seismic Category I requirements.

The system design incorporated sufficient redundancy to prevent a malfunction or failure of any single active or passive component from impairing the capability of the system to supply fuel oil to at least two of the diesel engines.

Missile protection is provided for the fuel oil storage and transfer systems in accordance with General Design Criterion 4 of 10CFR50, Appendix A.

4.2.2 System Description

The diesel generator fuel oil storage and transfer system consists of:

1. Six diesel fuel oil storage tanks (three supplementary and three main tanks) - two for each diesel engine. Each set of storage tanks has a capacity of 66,000 gallons, providing sufficient fuel oil for continuous operation of the associated diesel engine at rated load for 7 days. Each tank is vented to atmosphere.

2. Six 10-gpm, full-capacity, electric motor-driven rotary positive displacement fuel oil transfer pumps (two pumps for each set of diesel generator fuel oil storage tanks). Each pump has a relief valve discharging back to its associated suction line. Each diesel generator fuel oil transfer pump is mounted directly above its associated main fuel oil storage tank.

3. A diesel generator fuel oil day tank for each diesel engine situated in the associated diesel generator room. Each diesel generator fuel oil day tank is sized to store 550 gallons of fuel oil and is supplied with a flame arrestor on the vent.

4. One 14-gpm, shaft-driven positive displacement fuel oil booster pump and one 13-gpm, ac motor-driven positive displacement fuel oil standby pump, per diesel engine. The shaft-driven booster and ac motor-driven standby pump are piped in parallel and mounted on the diesel engine skid. Each pump discharge is equipped with a relief valve back to the pump suction. A large mesh Y-type fuel oil strainer is located upstream of each booster pump.

4.3 DIESEL GENERATOR COOLING WATER SYSTEM

4.3.1 Design Bases

The diesel generator cooling water system is designed to provide an adequate flow of service water to limit the temperature rise of the jacket water and intercooler water through the engine. Each of the three diesel generators has its own jacket cooling water and intercooler system.

The engine jacket cooling water and intercooler system, heat exchangers, keep-warm pump, keep-warm heater, and piping are designed to ASME Section III Code Class 3. The shaft-driven engine jacket water and intercooler circulation pumps are designed according to manufacturer's standards. All components of the diesel generator cooling water systems are designed and qualified to Seismic Category I requirements. The diesel cooling water systems are furnished as a part of the diesel generator package, pre-piped by the manufacturer.

4.3.2 System Description

Each diesel generator cooling water system consists of:

1. One shaft-driven jacket water circulation pump

2. Three water temperature regulating valves, which maintain the engine jacket cooling water, intercooling water, and injector cooling water at a proper temperature when the engine is running and which include a method of bypassing the heat exchanger for fast engine warmup

3. One jacket water expansion tank for water expansion for both systems

4. One electric immersion heater located on the engine skid, thermostatically controlled to maintain the engine jacket cooling water warm when the engine is not running

5. One ac motor-driven jacket water keep-warm pump, for moving the water through the jacket cooling water system when the engine is not running

6. Two heat exchangers for maintaining the engine jacket cooling and intercooler water at the desired temperature. They are of the shell and tube type with the jacket water flowing through the shell and the service water flowing through the tubes.

7. One engine-driven intercooler pump. The diesel generator cooling water systems are completely self-contained closed loops, with the engine jacket water and intercooler used for cooling the various engine components. The service water system is interfaced with the engine jacket cooling water and intercooler systems only at the engine jacket cooling water heat exchanger.

   Each diesel generator cooling water system set (jacket water and intercooler) is a completely independent system, thereby satisfying the single failure criteria by assuring operation of at least two of the three diesel generators.

4.4 DIESEL GENERATOR AIR START SYSTEM

4.4.1 Design Bases

Each diesel generator has a separate air start system designed to be capable of starting the diesel engine without external power and also to meet the single failure criterion. The air storage tanks and piping between tanks and the air start distributors are designed to ASME Boiler and Pressure Vessel Code Section III Class 3. All other portions of this system are designed to manufacturer's standards and Seismic Category I requirements, except the air compressor (Seismic Category II).

4.4.2 System Description

Other than a common air compressor and refrigerant air drier with moisture trap, each redundant start system includes the following:

1. Two check valves

2. Two air storage tanks with relief valves and drain valves.

3. One manual shutoff valve

4. One strainer

5. Instrumentation and control systems

6. Air start distributor system

Each air start system is of sufficient volume to be capable of cranking the engine for a minimum of five starts without recharging the tanks.

Each motor-driven air compressor has the capacity to recharge the air storage system in 60 minutes to provide for a minimum of five starts. Its motor is furnished with automatic start and stop control on pressure signals from the air storage tanks.

The instrumentation and controls are designed and fabricated to manufacturer's standards and are of a proven, reliable design.

4.5 DIESEL GENERATOR LUBRICATION SYSTEM

4.5.1 Design Bases

Each diesel generator has its lubrication system integral with the diesel engine.

The diesel generator lubrication system is designed to have sufficient capacity to ensure adequate lubrication of main bearings, crank pins, crankshaft bearings, valve gear, rocker arms, and all other oil lubricated wearing parts. The oil is also used for piston cooling. Manufacturing standards are as indicated in Section 4.4.2. All the components of the lubrication system are qualified Seismic Category I.

4.5.2 System Description

Each diesel generator lubrication system includes the following equipment:

1. One direct engine-driven lubricating oil pump (Manufacturer's Standard)

2. One ac motor-driven prelube keep-warm pump to supply warm lubricating oil to the engine sump and other necessary components when the engine is not running and to provide lube oil filtration when the engine is running, as well as supply pressurized oil to the engine block until the shaft-driven pump reaches effective speed (ASME III Class 3)

3. Lubricating oil filters and strainers of the simplex type (ASME III Class 3)

4. One lubricating oil cooler of the shell and tube heat exchanger type, capable of controlling the lubricating oil temperature at the required levels by the engine jacket cooling water (ASME III Class 3)

5. One lube oil makeup tank (ASME III Class 3)

6. One lube oil sump built into the engine skid base (Manufacturer's Standard)

7. One lube oil heater (ASME III Class 3)

8. One engine-driven rocker-arm lube oil pump (Manufacturer's Standard)

9. One ac motor-driven rocker-arm lube oil pump (Manufacturer's Standard)

10. One rocker-arm oil filter (Manufacturer's Standard)

11. One rocker-arm oil reservoir (Manufacturer's Standard)

4.6 COMBUSTION AIR INTAKE AND EXHAUST SYSTEM

4.6.1 Design Bases

Each of the three diesel generators has a combustion air intake and exhaust system. Each system is designed to withstand the effects of a tornado and is provided with silencers to reduce noise to acceptable levels. Combustion air piping and expansion joints are designed to ASME III Class 3. The turbocharger, intake air filter, and intake and exhaust silencers are designed to manufacturers' standards. All combustion air system components are qualified as Seismic Category I.

4.6.2 System Description

Each combustion air intake and exhaust system consists of:

1. One intake air filter
2. One intake silencer
3. Expansion joints and flexible connections to limit piping loads on equipment
4. One exhaust silencer

4.7 DIESEL GENERATOR BUILDING VENTILATION

Each of the three diesel generators is located in its own room, separated by 3-hour fire walls, in a tornado-proof Seismic Category I building.

4.7.1 Design Bases

The diesel generator building ventilation system provides ventilating air to the diesel generator rooms, fuel oil day tank rooms, electrical equipment rooms, and service equipment rooms.

4.7.2 System Description

Each diesel generator room is provided with an independent and identical ventilation subsystem. The subsystem provides ventilation when the diesel generators are not operating and a suitable environment for equipment when the diesel generators are operating.

Each diesel generator room ventilation subsystem operates in two distinct modes.

1. Normal ventilation (diesel generator not operating)

2. Standby ventilation (diesel generator operating or room temperature exceeds 104°F)

Normal ventilation consists of nominal capacity exhaust fans. The fans exhaust air from the diesel generator space to the atmosphere through tornado missile protected hoods. Unit heaters are provided to maintain minimum space temperature. This arrangement is designated non-safety related.

Standby ventilation consists of primary and supplementary supply air fans. Modulating outdoor, return, and exhaust air dampers are used in conjunction with the primary fan. The primary supply air fan automatically commences operation whenever the diesel generator is operated or whenever the room temperature exceeds 104°F. When the diesel generator room temperature rises to 110°F, the supplementary supply air fan automatically starts to maintain design room temperature. This arrangement is designated as QA Category I.

Each of the electrical equipment rooms, fuel oil day tank rooms, and service equipment rooms is provided with an individual ventilation subsystem for required area ventilation.

The electrical equipment rooms are provided with ventilating units. The ventilating units supply filtered air as required. Room temperature is maintained by mixing return air and outside air. When outside air is being supplied, the excess air is relieved into the diesel generator space through a two-position motorized damper. When this excess air quantity exceeds the exhaust rate from the diesel generator space, a backdraft damper in the normal exhaust system ductwork relieves any pressure that develops in the space. A unit heater is provided to maintain minimum space temperature. The electrical equipment room ventilation subsystem is designated as QA Category I, except for the unit heater.

The fuel oil day tank rooms are served by nominal capacity exhaust fans. The fans exhaust air from the fuel oil day tank rooms through fusible link fire dampers to the atmosphere to prevent potential fume buildup. Supply air is introduced to each room through a transfer grill with a fusible link fire damper. This subsystem is designated non-safety related.

The service equipment rooms are ventilated naturally through a door louver open from the diesel generator room. Unit heaters are provided to maintain minimum space temperature. The unit heaters are designated non-safety related.

The diesel generator auxiliary room is provided with two roof ventilators and a unit heater to maintain the space temperature within the allowable tolerances. The ventilator and unit heater are designated non-safety related.

4.8 FIRE PROTECTION SYSTEM

4.8.1 Water Suppression Systems

The diesel generator building water fire protection systems are served by a 6-inch branch line entering the building at the service cubicle for each unit, feeding a strainer and pipe header located in the service cubicle. The branches at approximately el 15 feet-9 inches extend from a single branch line connected to the main yard loop.

Emergency Diesel Generator Rooms 901, 902, and 903

A complete supervised preaction sprinkler system using closed fusible link sprinkler nozzles is provided to protect each of the three diesel generator rooms. The water trajectory as it impinges on the equipment in the room is limited to within 15 degrees of vertical consistent with dripproof equipment design.

Each system is designed for complete automatic actuation of the respective deluge valve by operation of electric continuous line thermistor detection system (Class IE). Manual electric and manual mechanical operations are also provided.

Fuel Oil Day Tank Rooms 901, 902, and 903

Each fuel oil day tank water spray system is designed for completely automatic actuation of the deluge valve by an electric thermistor heat detector. Manual actuation, instrumentation, and alarms are similar to the above systems.

Cable Vaults 901, 902, and 903

Each cable vault water spray system is designed for completely automatic actuation of the deluge valve by two cross-zoned normally open circuited smoke detectors. One zone is of the ionization type. The other is of the photoelectric type. Manual actuation, instrumentation, and alarms are similar to the above systems.

Hose Rack Stations

Each service room is furnished with a Class III standpipe and hose rack station supplied with water from the pressurized yard loop. Separate valved lines with paddle type flow indicators running from the piping headers serve each hose rack stations.

Hydrant Hose House

A hydrant hose house is located immediately to the west of the diesel generator building to provide backup fire protection.

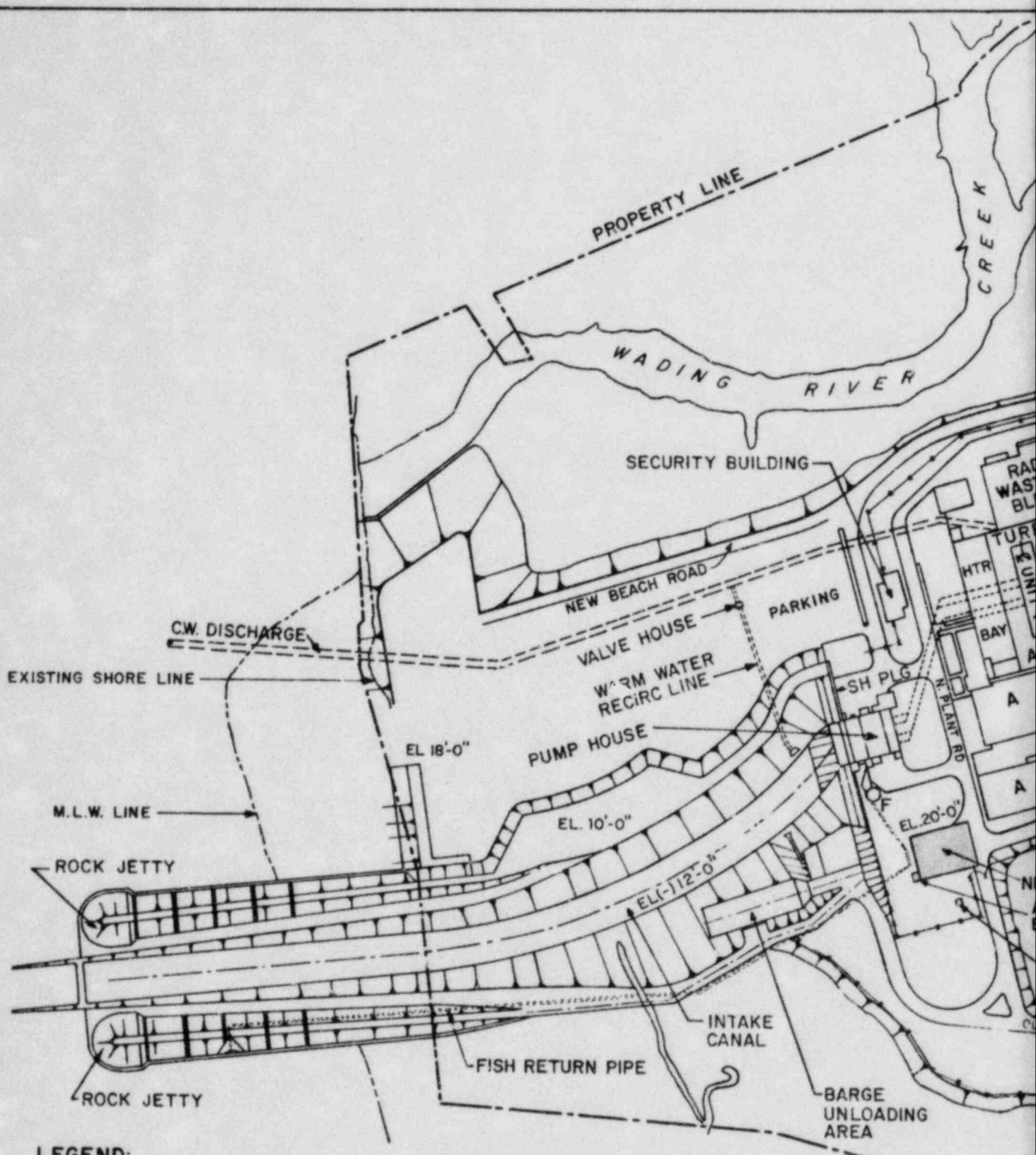
4.8.2 Halon 1301 System

Diesel Generator Electrical Equipment Room

The Halon 1301 total flooding fire protection system for the Electrical Equipment Rooms 901, 902 and 903 has a centrally located main cylinder and connected reserve of the same size and capacity as the main. A system of valves and piping conveys the Halon 1301 to the nozzles in the protected areas. A panel, mounted locally in the vicinity of the Halon 1301 tanks, houses the "Main Tank" and "Reserve Tank" selector switch with indicating lights and relays to be used in conjunction with the local fire panels for control circuit supervision. Halon cylinders are indicated in the auxiliary room.

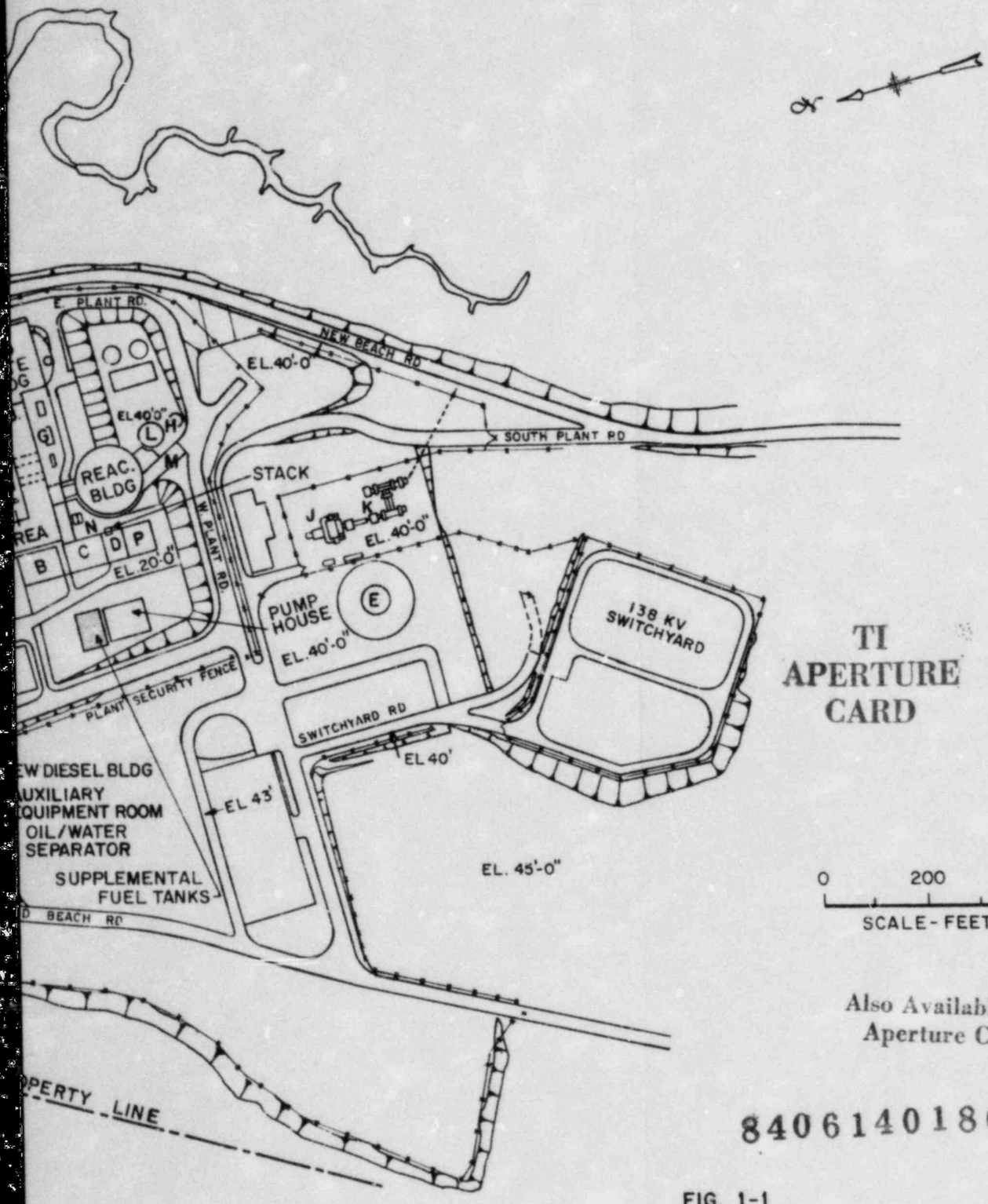
Automatic actuation is initiated by cross-zoned ionization type and photoelectric type smoke detectors. The detector system (Class IE) for each system is designed to actuate a fire alarm circuit consisting of local audible and visual devices and an annunciator on the main fire protection panel in the Main Control Room. Each system also is capable of manual actuation of the Halon 1301 system via a manual electric pushbutton switch located on the local fire protection panel. The Halon 1301 also is operated manually by a mechanical-operated lever local at the cylinders.

On a fire detection, fire doors shall automatically shut by deenergizing door holder, the electric equipment room ventilation trip, and the electric unit heater trips.



LEGEND:

A - OFFICE AND SHOPS
B - CONTROL ROOM
C - OLD DIESEL BUILDING
D - AUXILIARY BOILER HOUSE
E - GAS TURBINE OIL TANK
F - FISH REMOVAL TANK
G - MAIN TRANSFORMERS & NSST
H - DEMINERALIZED WATER TANK
J - AUXILIARY GAS TURBINE GENERATOR
K - 69 KV SWITCHYARD
L - CONDENSATE STORAGE TANK
M - ACCESS LOCK
N - RESERVE STATION SERVICE TRANSFORMER
P - MOTOR GENERATOR ROOM



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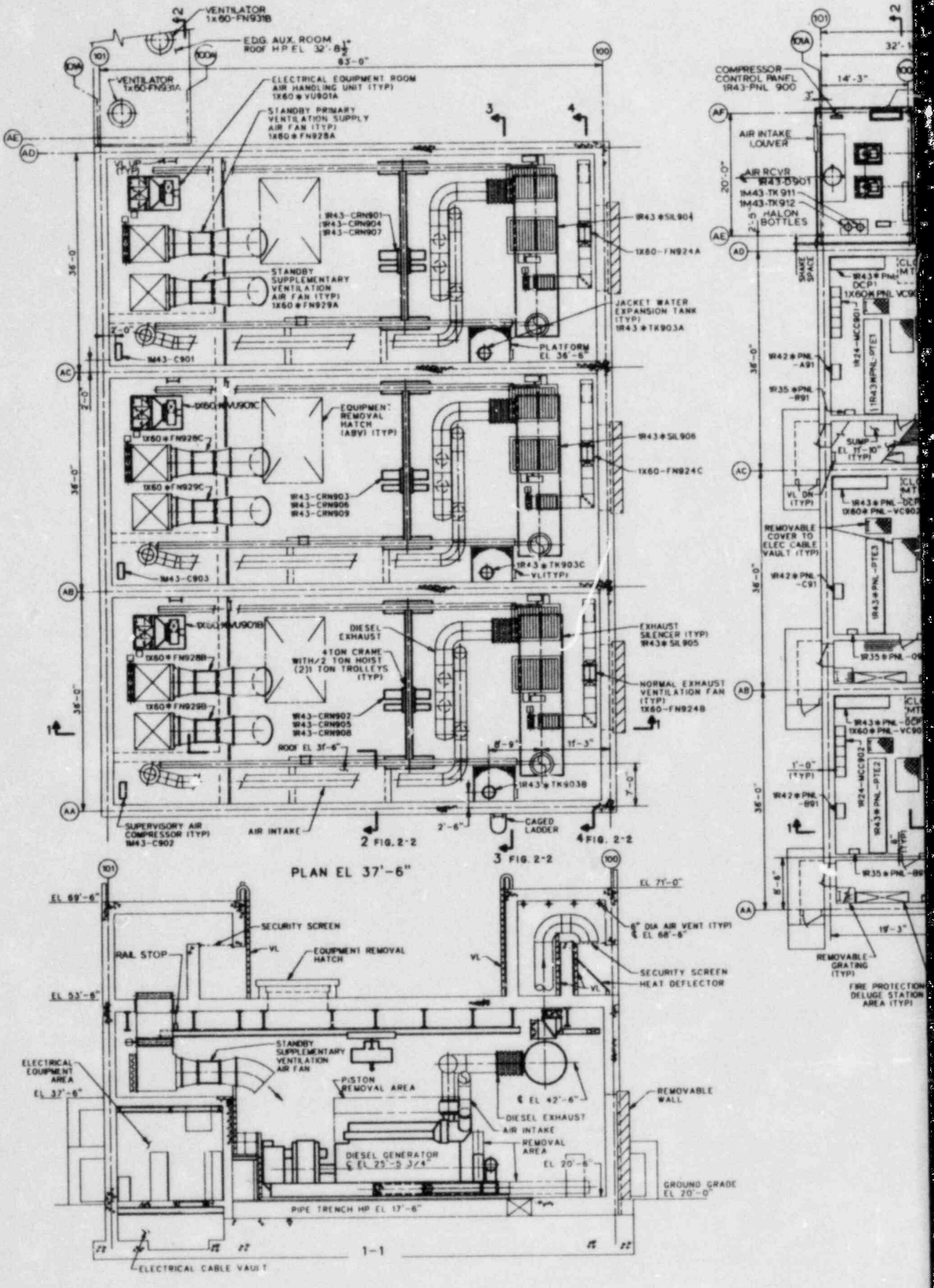
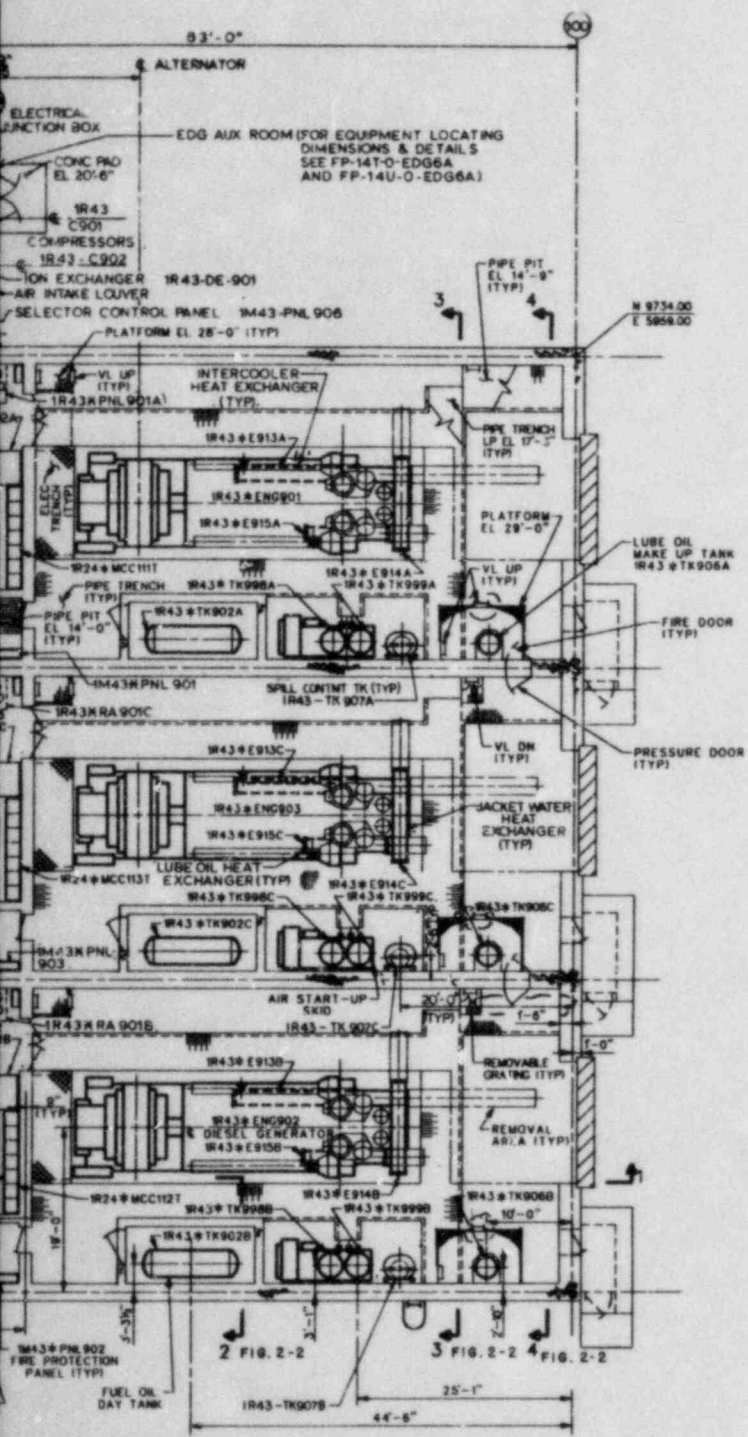
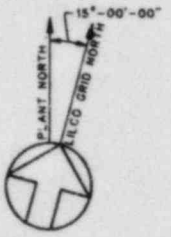
SCALE - FEET

FIG. 1-1
SITE PLAN
SHOREHAM NUCLEAR POWER STATION-UNIT 1
COLT DIESEL GENERATOR SUMMARY


VENTILATOR 1x60-FN931B
EDG. AUX. ROOM ROOF HP EL 32'-8½"
83'-0"
VENTILATOR 1x60-FN931A
ELECTRICAL EQUIPMENT ROOM AIR HANDLING UNIT (TYP) 1X60 ✱ VU901A
STANDBY PRIMARY VENTILATION SUPPLY AIR FAN (TYP) 1X60 ✱ FN928A
1R43-CRN901
1R43-CRN904
1R43-CRN907
1R43 ✱ SIL904
1X60-FN924A
STANDBY SUPPLEMENTARY VENTILATION AIR FAN (TYP) 1X60 ✱ FN929A
JACKET WATER EXPANSION TANK (TYP) 1R43 ✱ TK903A
PLATFORM EL 36'-6"
1M43-C901
EQUIPMENT REMOVAL HATCH (ABV) (TYP)
1X60 ✱ VU901C
1X60 ✱ FN928C
1X60 ✱ FN929C
1R43-CRN903
1R43-CRN906
1R43-CRN909
1R43 ✱ SIL906
1X60-FN924C
1R43 ✱ TK903C VL (TYP)
1M43-C903
DIESEL EXHAUST
4 TON CRANE WITH/2 TON HOIST (2)½ TON TROLLEYS (TYP)
1X60 ✱ VU901B
1X60 ✱ FN928B
1X60 ✱ FN929B
1R43-CRN902
1R43-CRN905
1R43-CRN908
EXHAUST SILENCER (TYP) 1R43 ✱ SIL905
NORMAL EXHAUST VENTILATION FAN (TYP) 1X60-FN924B
ROOF EL 31'-6"
1R43 ✱ TK903B
SUPERVISORY AIR COMPRESSOR (TYP) 1M43-C902
AIR INTAKE
2 FIG. 2-2
3 FIG. 2-2
4 FIG. 2-2
CAGED LADDER
PLAN EL 37'-6"
COMPRESSOR CONTROL PANEL 1R43-PNL 900
AIR INTAKE LOUVER
AIR RCVR 1R43-D901
1M43-TK911
1M43-TK912
HALON BOTTLES
SHAKE SPACE
1R43 ✱ PNL DCP1
1X60 ✱ PNL VC901
1R24-WCC901
1R43 ✱ PNL-PTE1
1R42 ✱ PNL-A91
1R35 ✱ PNL-891
SUMP EL 17'-10" (TYP)
VL DN (TYP)
1R43 ✱ PNL-DCP2
1X60 ✱ PNL-VC902
REMOVABLE COVER TO ELEC. CABLE VAULT (TYP)
1R43 ✱ PNL-PTE3
1R42 ✱ PNL-C91
1R43 ✱ PNL-DCP3
1X60 ✱ PNL-VC903
1R24-WCC902
1R43 ✱ PNL-PTE2
1R42 ✱ PNL-B91
1R35 ✱ PNL-B9
REMOVABLE GRATING (TYP)
FIRE PROTECTION DELUGE STATION AREA (TYP)
EL 69'-6"
EL 71'-0"
SECURITY SCREEN
RAIL STOP
VL
EQUIPMENT REMOVAL HATCH
6" DIA AIR VENT (TYP) ℄ EL 68'-6"
SECURITY SCREEN
HEAT DEFLECTOR
EL 53'-9"
STANDBY SUPPLEMENTARY VENTILATION AIR FAN
ELECTRICAL EQUIPMENT AREA
EL 37'-6"
PISTON REMOVAL AREA
℄ EL 42'-6"
DIESEL EXHAUST
AIR INTAKE
REMOVAL AREA
REMOVABLE WALL
DIESEL GENERATOR ℄ EL 25'-5 3/4"
EL 20'-6"
GROUND GRADE EL 20'-0"
PIPE TRENCH HP EL 17'-6"
ELECTRICAL CABLE VAULT
1-1



PLAN EL 20'-6"



NOTES

1. DELETED
2. MECHANICAL EQUIPMENT & DIMENSIONS SHOWN ARE TYPICAL FOR EACH DIESEL GENERATOR ROOM.
3. ALL ENTRANCE WAYS TO THE OUTSIDE SHOULD BE WATER TIGHT.
4. PLATFORMS AND LADDERS ARE TO BE REMOVABLE.
5. PIPE TRENCHES ARE TO BE SLOPED TO PIPE PITS.
6. EXHAUST ENCLOSURES ARE TO BE INSULATED WITH HEAT AND SOUND RESISTANT MATERIAL.
7. 2" THK GRATING OVER PIPE TRENCH & PIT AREAS.
8. WATERTIGHT CHECKER PLATE OVER ELEC TRENCH.
9. SECTION OF SECURITY SCREEN TO BE REMOVABLE FOR ACCESS TO AIR DISCHARGE AREA.
10. * OR SWEC SAFETY CLASS (SHOWN AS CC 1,2, OR 3 DESIGNATES NUCLEAR SAFETY RELATED PIPING AND EQUIPMENT.

NUCLEAR SAFETY RELATED

0 20 40

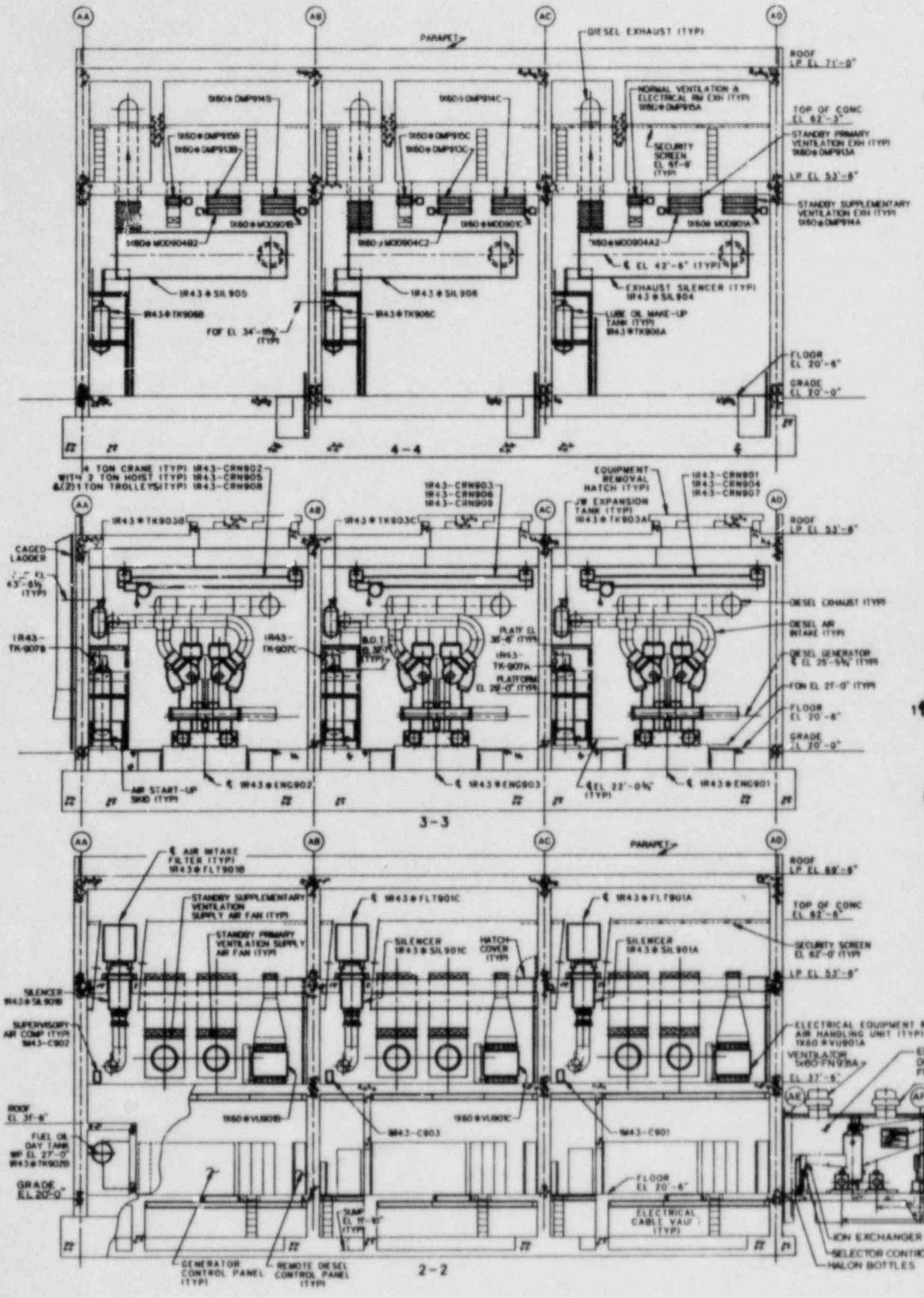
SCALE-FEET

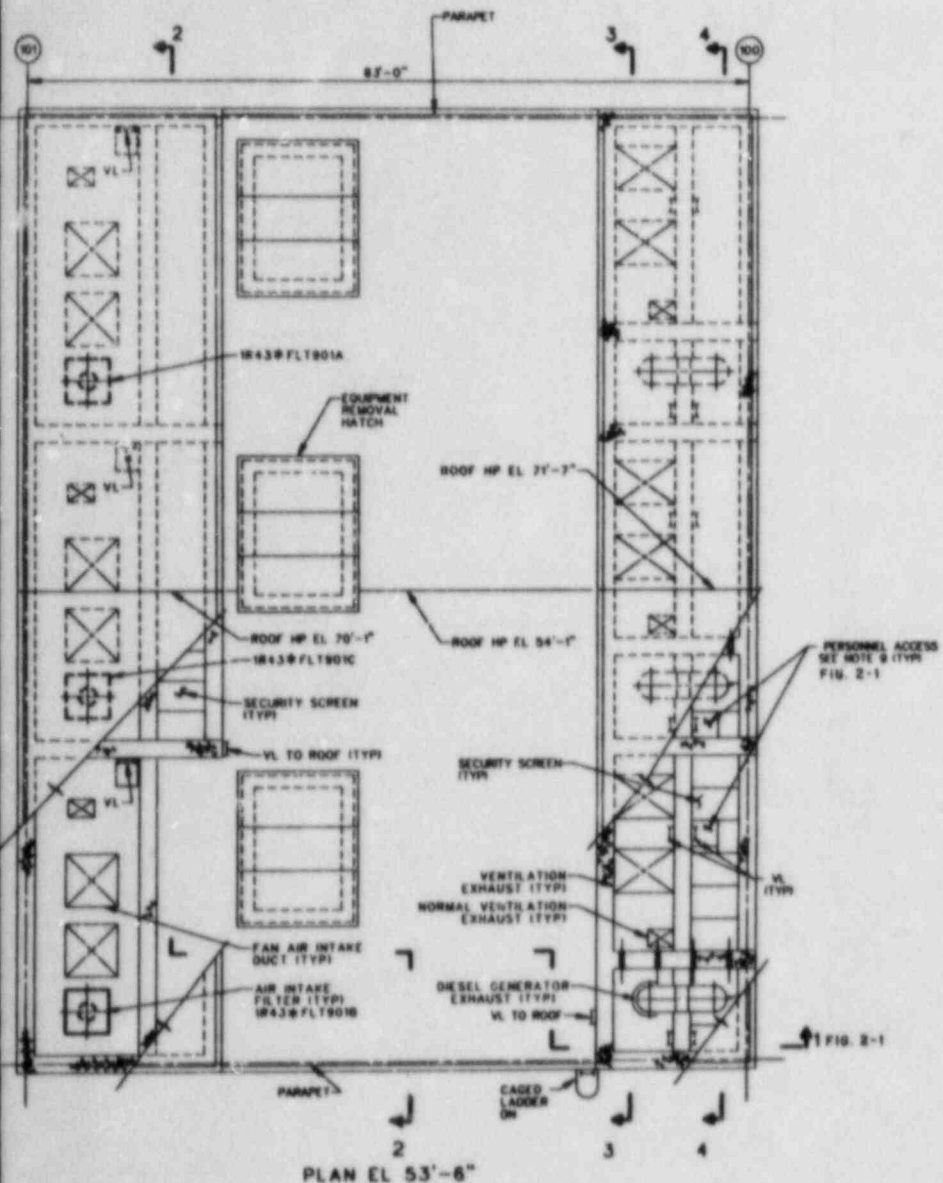
FIG. 2-1

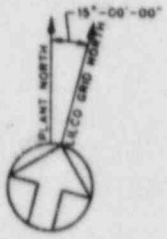
DIESEL GENERATOR BUILDING

SHOREHAM NUCLEAR POWER STATION-UNIT 1

COLT DIESEL GENERATOR SUMMARY


PARAPET
DIESEL EXHAUST (TYP)
ROOF LP EL 71'-0"
NORMAL VENTILATION & ELECTRICAL RM EXH (TYP) 1X60 DMP915A
TOP OF CONC EL 62'-3"
STANDBY PRIMARY VENTILATION EXH (TYP) 1X60 DMP913A
SECURITY SCREEN EL 61'-9" (TYP)
LP EL 53'-6"
STANDBY SUPPLEMENTARY VENTILATION EXH (TYP) 1X60 DMP914A
EL 42'-6" (TYP)
EXHAUST SILENCER (TYP) 1R43 SIL 904
LUBE OIL MAKE-UP TANK (TYP) 1R43 TK906A
FLOOR EL 20'-6"
GRADE EL 20'-0"
4 - 4
4 TON CRANE (TYP) 1R43-CRN902 WITH 2 TON HOIST (TYP) 1R43-CRN905 &(2) 1 TON TROLLEYS(TYP) 1R43-CRN908
1R43-CRN903 1R43-CRN906 1R43-CRN909
EQUIPMENT REMOVAL HATCH (TYP)
1R43-CRN901 1R43-CRN904 1R43-CRN907
JW EXPANSION TANK (TYP) 1R43 TK903A
ROOF LP EL 53'-6"
CAGED LADDER
DIESEL EXHAUST (TYP)
DIESEL AIR INTAKE (TYP)
1R43-TK-907B
1R43-TK-907C
PLATF EL 35'-6" (TYP)
1R43-TK-907A
PLATFORM EL 28'-0" (TYP)
DIESEL GENERATOR EL 29'-5½" (TYP)
FDN EL 21'-0" (TYP)
FLOOR EL 20'-6"
GRADE EL 20'-0"
AIR START-UP SKID (TYP)
EL 22'-0½" (TYP)
3 - 3
AIR INTAKE FILTER (TYP) 1R43 FLT 901B
PARAPET
ROOF LP EL 69'-5"
STANDBY SUPPLEMENTARY VENTILATION SUPPLY AIR FAN (TYP)
STANDBY PRIMARY VENTILATION SUPPLY AIR FAN (TYP)
1R43 FLT 901C
1R43 FLT 901A
TOP OF CONC EL 62'-3"
SILENCER 1R43 SIL 901C
HATCH COVER (TYP)
SILENCER 1R43 SIL 901A
SECURITY SCREEN EL 62'-0" (TYP)
LP EL 53'-6"
SILENCER 1R43 SIL 901B
SUPERVISORY AIR COMP (TYP) 1M43-C902
ELECTRICAL EQUIPMENT ROOM AIR HANDLING UNIT (TYP) 1X60 VU 901A
VENTILATOR 1X60 FN 918A
EL 37'-6"
ROOF EL 31'-6"
1X60 VU 901B
1X60 VU 901C
1M43-C903
1M43-C901
FUEL OIL DAY TANK WP EL 27'-0" 1R43 TK 902B
GRADE EL 20'-0"
FLOOR EL 20'-6"
SUMP EL 19'-10" (TYP)
ELECTRICAL CABLE VAULT (TYP)
GENERATOR CONTROL PANEL (TYP)
REMOTE DIESEL CONTROL PANEL (TYP)
2 - 2





NOTE
GENERAL NOTES - FIG. 2-1.

NUCLEAR SAFETY RELATED

0 20 40
SCALE-FEET

ROOM (FOR EQUIPMENT LOCATING
VS & DETAILS SEE
EDG6A & FP-14U-0-EDG6A
ATOR 1x60-FN0318
HP EL 32'-8½"
T HEATER 1X50-UH923
INTAKE LOUVER
RECEIVER 1R43-D901
43-PNL 900
ECTRICAL JUNCTION BOX
OR EL 20'-6"
ADE EL 20'-0"
R43-C901
R43-C902 COMPRESSORS
E-901
R43-PNL 906
K-911 & 912

FIG. 2-2
DIESEL GENERATOR BUILDING
SHOREHAM NUCLEAR POWER STATION-UNIT 1
COLT DIESEL GENERATOR SUMMARY