Wisconsin Electric
POWER COMPANY

231 W Michigan, PO Box 2046, Milwaukee, WI 53201-2046 (414) 221-2345

June 15, 1994

NPL 94-0237

Document Control Desk
U.S. NUCLEAR REGULATORY COMMISSION
Mail Station P1-137
Washington, D.C. 20555

Gentlemen:

DOCKETS 50-266 AND 50-301
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE INSTALLATION OF TWO ADDITIONAL
EMERGENCY DIESEL GENERATORS (TAC NOS. M87865 AND M87866)
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

In a letter dated May 24, 1994, the NRC staff provided a request for additional information regarding the installation of two additional emergency diesel generators at the Point Beach Nuclear Plant. Our response to this request is contained in the attachments to this letter.

Please feel free to contact us if you have any questions.

Sincerely,

Gary M. Krieser
Manager,
Industry and Regulatory Services

Attachments

Copies to: Regional Administrator, Region III
NRC Resident Inspector

A001
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RESPONSE TO THE REQUEST FOR ADDITIONAL INFORMATION
REGARDING THE INSTALLATION OF TWO ADDITIONAL
EMERGENCY DIESEL GENERATORS (TAC NOS. M87865 AND M87866)
POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

1.0 With regard to the glycol cooling (diesel engine cooling) system, provide the following information:

a. Discussion of the temperature indications and alarms provided to monitor the high and low jacket water temperatures, and standby low temperature.

c. Discussion of system operation and control.

Each engine cooling system consists of two engine-driven centrifugal water pumps, replaceable inlet water manifolds with individual jumper lines to each cylinder liner, cylinder head discharge elbows, an outlet manifold through which coolant is circulated, an expansion tank, a drain tank, a radiator and a temperature regulating valve.

During operation, heated coolant from the engine discharge manifold flows to the temperature regulating valve. This valve responds to the coolant temperature and either routes the coolant through the radiator and then the lube oil cooler or directly to the lube oil cooler. From the lube oil cooler the coolant flows to the engine-driven centrifugal water pumps then back through the engine. The temperature regulating valve is a diverting valve that maintains the engine coolant discharge temperature at 185°F.

When an engine is started and is cold, the valve causes all coolant to bypass the radiator until the engine has warmed up. After warm up, part of the heated coolant bypasses and part is directed to the radiator. The bypassed coolant is mixed with the cool coolant returning from the radiator before re-entering the engine. Valve action and coolant mixing maintains the desired engine coolant temperature.

When the coolant from the engine reaches the nominal operating temperature, it will close the bypass side entirely and all the coolant will flow through the radiator. When the engine starts, two of the three radiator fans will start. The third fan is controlled by TS-3343, which will start when the coolant temperature reaches 190°F.

Two engine temperature switches, TS-3342 and TS-3312, are mounted on the coolant piping between the engine coolant outlet and the accessory rack mounted temperature regulating valve. Should the engine coolant temperature reach 200°F, TS-3312 will close its contact to pick up the HIGH JACKET

WATER TEMPERATURE alarm. If the temperature continues to rise to 208°F, TS-3342 will close its contact to trip the generator circuit breaker and the engine, this trip is not active during operation of the EDG when it has been started from an emergency start signal. The HIGH JACKET WATER TEMPERATURE trip, TS-3342, can be reset after the temperature drops to approximately 200°F. The HIGH JACKET WATER TEMPERATURE alarm can only be reset after the engine discharge coolant temperature falls below 190°F and TS-3312 opens.

The immersion heater temperature control switch, TS-3306, is mounted at the inlet to the lube oil cooler. The immersion heater temperature control switch operates to control power to the immersion heater elements during engine shutdown. Coolant heated by the immersion heater circulates through the lube oil cooler and the engine by thermosyphon action to warm the engine. The immersion heater is set to operate between 125 and 155°F. The low jacket water temperature alarm switch, TS-3311, is set to alarm at 110°F.

b. Discussion of the engine water level indications and alarms.

Each expansion tank is fitted with a sight glass for local indication of coolant level. Level switch LS-15 provides a coolant low level alarm at the engine control panel.

d. The means provided to assure that the failure of non-essential portions of the system or of other systems not designed to seismic Category I standards and located close to essential portions of the system.

All systems and components designated as safety related will be designed and qualified as Seismic Class I. All systems and components not designated as safety-related will be designed to Seismic Class I or Class II standards to ensure that a Safe Shutdown Earthquake would not cause any structural failure resulting in damage to safety related systems or components.

2.0 With regard to the EDG fuel oil storage and transfer system, provide the following information:

a. You indicated that fuel oil will be supplied to the existing EDGs 2(G01/G02) under all design basis conditions from the new system and that the existing/old system will be isolated from the new system with dual valve isolation. Discuss your plan whether to use the existing/old system as a means to provide additional storage capacity for the EDGs or to use the existing/old system for other purposes (e.g. for auxiliary boilers).

If the existing/old system will be used as a means to provide additional storage capacity for the EDGs, the surveillance and fuel oil testing requirements should apply to both new and existing/old systems to ensure good quality fuel oil for the EDGs.

If the existing/old system will be used for other purposes, discuss the administrative control program to be established to prevent inadvertent operation (open) of the above cited dual system isolation valves.

There are no plans at this time to use the existing/old fuel oil system to provide additional storage capacity for any of the Emergency Diesel Generators. Once the new system is placed in service the old system will be isolated from the diesel engine fuel systems with two isolation valves. The old system will continue to service all of its remaining loads. The two isolation valves will be shown on the system P&ID and the system valve checklist as locked closed.

The new fuel oil system will be fully functional for the new emergency diesel generators (G-03 and G-04) as they are placed into service. The original fuel oil system will continue to provide fuel oil for the original emergency diesel generators (G-01 and G-02) until the Unit 1 refueling outage in 1995, currently scheduled for April-May 1995. Until that time, the original fuel oil supply system will serve the original emergency diesel generators and the new fuel oil system will serve the new emergency diesel generators.

The Technical Specification requirement (TS 15.3.7.A.1.f) is 11,000 gallons of fuel oil available. The present Technical Specification Bases state that a fully loaded EDG consumes approximately 205 gallons per hour and that 11,000 gallons is sufficient fuel to operate one EDG at design load for more than 48 hours. This requirement will remain the same under the proposed Technical Specifications, except that the new fuel oil system will have two tanks, so the 11,000 gallons will be required in each tank that provides fuel for operable emergency diesel generators. This effectively doubles the fuel oil storage requirement when the first new emergency diesel generator is placed in service, because that EDG will have an 11,000 gallon supply requirement and the original emergency diesel generators will have an 11,000 gallon supply requirement.

In the original fuel oil system, an additional supply of fuel oil is maintained on the site in two 60,000 gallon storage tanks to supply the gas turbine generator, the heating boilers, and the diesel driven fire pump. This oil can be transferred by a gravity feed to the original 12,000 gallon

underground emergency storage tank. From there, the fuel oil can be transferred by the original fuel oil transfer pumps to the original emergency diesel generators G-01 and G-02.

After the new fuel oil system is placed into service for the existing emergency diesel generators, it is not expected that the existing fuel oil system will be used to support any EDG operation. The existing fuel oil system will continue to supply fuel oil for the heating boilers and the gas turbine generator used for station blackout as discussed above. The amount of fuel needed for station blackout from the existing bulk fuel storage tanks is an eight hour supply at approximately 2,000 gph, or about 16,000 gallons.

b. **You also indicated that cross-ties between the day tanks and between fuel oil storage tanks are provided to allow more flexible EDG operations. Provide: drawings/diagrams to show all the system cross-ties and the above cited dual system isolation valves; a detailed description of each mode of system operation; a commitment of the operating procedures to be developed for each mode of the system operation; and a description of the training plan for the licensed/non-licensed operators.**

The above cited dual system isolation valves between the existing and new systems are shown in the attached fuel oil system drawing. The valves FO-32 and FO-129 will provide double valve isolation between T-31A (the EDG G-01 day tank) and the existing system. Valves FO-31 and FO-127 provide double isolation between T-31B (the EDG G-02 day tank) and the existing system.

Cross ties are provided between day tanks of the same train. These cross ties are shown in Figure 4-4 of the Design Summary for G03 and G04, and in the attached fuel oil system drawing for G01 and G02. There are two valves in each cross tie. These valves are shown as normally closed on the system P&ID and will be shown as normally closed on the system valve checklist.

In the event of a failure of a fuel oil transfer pump or day tank level indicator the cross tie between the tanks could be opened. Opening the cross tie would allow a single transfer pump to provide fuel to both day tanks or allow a single level indicator to provide indication for both tanks.

A cross tie is also provided between the new fuel oil storage tanks. This cross tie is shown in Figures 4-3 and 4-4 of the design summary. There are two valves in the cross tie. These valves are shown as locked closed on the system P&ID and will be shown as locked closed on the system valve checklist. This

cross tie is not intended to be used during any normal operating condition. It does provide the flexibility to transfer fuel between the storage tanks for inspection purposes or during abnormal operating conditions.

Procedures for operation of the new fuel oil system are currently being developed based on the schedule for putting the new engines in service. G04 is scheduled to be put in service in the fall of 1994. G03 is scheduled to be put in service in the spring of 1995. Operator training on these procedures will be completed through the normal training cycle. Operator training on the system configuration and procedures will be completed prior to entering that configuration.

c. The means provided to assure that the failure of non-essential portions of the system or of other systems not designed to seismic Category I standards and located close to essential portions of the system.

All systems and components designated as safety related will be designed and qualified as Seismic Class I. All systems and components not designated as safety-related will be designed to Seismic Class I or Class II standards to ensure that a Safe Shutdown Earthquake would not cause any structural failure resulting in damage to safety-related systems or components.

3.0 With regard to the EDG starting air systems, provide the following information:

a. Discussion of the pressure indications and alarms provided to monitor the pressures in the air receivers.,

b. The capacities of the EDG starting air compressors and their associated dryers,

c. As indicated in the submittal, each air dryer assembly contains two desiccant towers. In general, the dryer operates on an approximate 10 minute cycle. During the first 5 minutes, tower A dries the incoming air and supplies a certain amount of the dry air to tower B to regenerate the desiccant in tower B. If the capacity of the dryer is exceeded, it will become ineffective after several cycles because dry air will not be available to regenerate the desiccant. Discuss the provisions provided to ensure that the capacities of the EDG starting air compressors will not exceed the capacities of their associated dryers.

Each starting air system is made up of a diesel driven and motor-driven air compressor, an after cooler, a wet air receiver, an air dryer, and two banks of air receivers. The system is non-safety related from the air compressors up to the inlet side of the check valve downstream of the air dryer.

Pressure switches, located downstream of the class break check valves, monitor the pressure in each bank of receivers. When the pressure in either bank drops to 235 psig the motor driven compressor is started to restore system pressure. If the system pressure continues to drop, at 230 psig the diesel driven compressor will start to restore system pressure. The compressors will stop when system pressure reaches 245 psig. If the system pressure drops to 230 psig, a LOW STARTING AIR PRESSURE alarm is initiated. Each air receiver is provided with local indication of receiver pressure.

On the engine skid there is a pressure switch for each bank of air start motors that will initiate a LOW STARTING AIR PRESSURE alarm if the starting air pressure downstream of the 250 to 200 psig pressure reducing valve drops to 160 psig.

The Quincy Model 325-14 air compressors are each designed to provide a maximum of 17 scfm at 250 psig. Under normal conditions only one compressor will be in operation. The Pneumatic Products Corporation dryer Model HA-25 is designed for a flow rate of 60 scfm at 250 psig. Therefore, the starting air compressors' flow rate cannot exceed the capacity of the dryer.

d. The means provided to assure that the failure of non-essential portions of the system or of other systems not designed to seismic Category I standards and located close to essential portions of the system.

All systems and components designated as safety related will be designed and qualified as Seismic Class I. All systems and components not designated as safety-related will be designed to Seismic Class I or Class II standards to ensure that a Safe Shutdown Earthquake would not cause any structural failure resulting in damage to safety-related systems or components.

4.0 With regard to the diesel engine lubrication system, discuss the means provided for indicating and monitoring: oil levels, temperatures, and pressures at various points of the system; and the differential pressures across the oil strainers and filters.

The engine lubricating system is a combination of four separate systems as seen on the attached lubricating oil system piping and instrument diagram 6090F03001. These systems are the main lubricating system, piston cooling system, scavenging oil system and circulating oil system.

The main lubricating oil system supplies oil under pressure to the various moving parts of the engine. The piston cooling system supplies oil for piston cooling and lubrication of the piston pin bearing surface. The scavenging oil system supplies other systems with cooled filtered oil.

Oil is drawn from the engine sump by the scavenging pump through a strainer in the strainer housing. From the strainer housing, the oil is then pumped through the lube oil filter and the lube oil cooler. The oil then flows to the strainer housing to supply the main lubricating and piston cooling pumps. After being pumped through the engine, the oil returns to the engine sump to be recirculated through the system.

The lube oil circulating pump circulates warm oil through the oil system and keeps the engine in a constant state of readiness for an immediate start. The 6 gpm pump draws oil from the oil pan and pumps it through a strainer and a 30 psi check valve to the lube oil filter, the lube oil cooler, and is returned to the oil pan through the strainer housing. A 3 gpm turbocharger lube oil pump also draws oil from the oil pan and pumps it through the rack mounted auxiliary turbocharger oil filter to the turbocharger bearing area. These pumps are motor driven and operate continuously.

The following pressure and temperature switches have been incorporated into the lube oil system to monitor system performance:

PS-3353	LOW TURBOCHARGER OIL PRESSURE
PS-3352	LOW ENGINE OIL PRESSURE
PS-3351,3355,3356	LOW ENGINE LUBE OIL SHUTDOWN (2 OF 3)
PS-3350	HIGH CRANKCASE PRESSURE
PS-3357	LOW CIRCULATING OIL PRESSURE
PS-3349	HIGH OIL FILTER INLET PRESSURE
TS-3348	LUBE OIL FILTER BYPASS TEMPERATURE
TS-3347	LOW LUBE OIL TEMPERATURE
TS-3346	HIGH LUBE OIL TEMPERATURE

LS-3354 provides an indication of a low oil sump level. Activation of the low lube oil level alarm indicates that approximately 257 gallons of lube oil is required to return the oil level to the full level.

5.0 With regard to the heating, ventilation, and air conditioning (HVAC), provide the following information:

a. Justifications for not providing safety related ventilation to the transfer pump and day tank rooms.

The fuel oil transfer pump and day tank rooms do not require ventilation fans during engine operating modes. Calculations have been performed based on an ambient outdoor temperature of 95°F which show that during operating modes without forced ventilation, room temperatures will not exceed the equipment qualification temperature of 105°F. Diesel fuel is classified as a combustible liquid, a liquid having a flash point at or above 100°F. The flashpoint of fuel received at PBNP is 110°F or greater, therefore, it is not necessary to provide ventilation in these areas during engine operating modes.

b. The means provided to assure that the failure of non-essential portions of the system or of other systems not designed to seismic Category I standards and located close to essential portions of the system.

All systems and components designated as safety related will be designed and qualified as Seismic Class I. All systems and components not designated as safety-related will be designed to Seismic Class I or Class II standards to ensure that a Safe Shutdown Earthquake would not cause any structural failure resulting in damage to safety-related systems or components.

6.0 With regard to Fire Protection provide the following:

a. Describe the plant fire protection water supply system (number and type of fire pumps, tanks, capacity, etc.), and verify that the system can supply the maximum demand (sprinklers and hose stations) of the Diesel Generator Building.

Fire Protection Water Supply

The water supply is obtained directly from Lake Michigan through two inlets to the forebay at the circulating water pumphouse. The water is drawn in through two separate traveling screens supplying suction to two automatic starting fire pumps. The capacity of the water supply meets the requirements of NFPA 13 and PBNP fire protection commitments.

Fire Protection System Pumping Capability

The fire pumps are vertical shafted, centrifugal pumps located in the pumphouse. Each pump is rated at 2000 gpm at 125 psi. One of the two fire pumps is electric driven with emergency power supplied by either Train A or Train B safeguards buses.

The other fire pump is driven by its own 220 hp diesel engine. A local fuel storage tank with a 250 gallon capacity will allow for 8 hours of continuous run time. Reserve fuel is provided from the plant diesel fuel supply system.

The fire water system pressure is maintained at 125 psi by an electric-driven jockey pump and 550 gallon accumulator tank. Both fire pumps are automatic starting at a given system pressure through approved fire pump controllers. Indication, alarm, and manual starting is available locally and at the central control room fire control panel.

If both the electric motor and diesel powered fire pumps are not available, the two 1100 gallon per minute, 108 psi screen wash pumps can be aligned to pump into the fire water system. An additional means of supplying pressure to the system is by having fire department pumpers take suction from the lake and discharge through hose lines to the fire water system connections at the pump house.

Fire Protection System Distribution Piping System

Each fire pump has a separate discharge line to a 10 inch underground fire water main loop which encircles the plant. The pump discharge lines are valved such that a break in one discharge line will not affect the operation of the fire water system. Post indicating sectionalizing valves are located for break isolation without diminishing the fire suppression capabilities of the system.

All interior protection systems can be supplied from two directions thus assuring continuity of service.

Diesel Generator Building Fire Protection Water Supply

The automatic and manual fire protection system piping is supplied from a new, 10 inch diameter, underground fire main looped around the Emergency Diesel Generator Building. The new fire main loop is connected to the existing, 10 inch diameter, dedicated, site fire protection distribution piping network. Two redundant, 8 inch diameter feed mains supply the building fire suppression systems from the new distribution loop.

Hydraulic calculations were prepared for each Diesel Generator Building sprinkler system back to the main fire pumps in accordance with NFPA 13. The calculations were performed utilizing the water supply from one of the two 100% redundant fire pumps and the longest piping route (i.e. the shortest leg out of service). The calculations included 750 gpm hose stream allowance. These calculations found the south diesel

generator room sprinkler system had the most limiting system demand of 1552 gpm (including hose streams) at 101 psi at the fire pump discharge. These calculations demonstrate that the PBNP fire protection water supply can provide the maximum Diesel Generator Building fire protection system demands.

b. **Identify the design standard (e.g. NFPA 24) used for the new outside underground piping system and verify that the system meets fire protection program commitments. Provide the maximum spacing between fire hydrants and identify the location and spacing of hose houses.**

NFPA 24-1992 was used as guidance in the design of the new fire protection underground piping system. The fire protection system for the new Diesel Generator Building was designed to satisfy PBNP fire protection program commitments in accordance with 10 CFR 50.48.

Two new fire hydrants (FH) 28 and 29 were installed on the new looped distribution piping system around the Diesel Generator Building. FH 28 is located approximately 40 feet southwest of the building and FH 29 is located approximately 60 feet northeast of the building. These new fire hydrants were spaced so they would be within approximately 250 feet from existing fire hydrants on the site fire protection distribution network. The locations of the this equipment is shown on the attached diesel generator bldg fire hydrant locations sketch.

One new hose house around FH 28 is located approximately 40 feet southwest of the new building. Another existing hose house around FH 26 is located approximately 140 feet southeast of the building. Each hose house is equipped with hoses, nozzles and other auxiliary equipment similar to that recommended in NFPA 24.

c. **Identify the standard used for the design and installation of the sprinkler system (e.g., NFPA 13) and verify that the system meets fire protection program commitments.**

NFPA 13-1991 was used as guidance in the design and installation of the new fire protection sprinkler systems for the new Diesel Generator Building. The fire protection sprinkler systems for the new Diesel Generator Building were designed to satisfy PBNP fire protection program commitments in accordance with 10 CFR 50.48.

d. Identify the standard used for the design and installation of the manual hose stations (e.g., NFPA 14) and verify that the hose station system meets fire protection program commitments. Specify the design pressure and flow rate for the hose stations. State if the 1-1/2 inch hose stations are designed to permit the use of 2-1/2 inch hose.

NFPA 14-1990 was used as guidance in the design and installation of the new fire protection hose station system for the Diesel Generator Building.

The hose station system was designed as an NFPA-14, Class II standpipe system. It is intended to be used by the plant fire brigade during initial response to a fire in the Diesel Generator Building. It provides two 1-1/2 inch hose stations on both the first and second floors of this two story building. Each hose station is provided with a 1-1/2 inch pressure restricting angle valve and 100 ft. of 1-1/2 inch fire hose. The pressure restricting valves are set to limit pressure below 100 psi so hose lines can be better handled by fire fighting personnel.

These hose stations are designed to maintain a minimum residual pressure of 65 psi at the topmost outlet of each standpipe with 100 gpm flowing. The hose stations are not designed to permit the use of 2-1/2 inch hose.

In the event 2-1/2 inch hose is required, the plant fire brigade can provide 2-1/2 inch hose streams from two wall hydrants located outside at the front of the building and/or from the nearby fire hydrants. A fire of this size and magnitude, requiring 2-1/2 inch hoses, would most likely occur on the first floor where the diesels and related diesel fuel and equipment are located. The use of wall hydrants and fire hydrants allows the fire brigade to assemble, stage and attack the fire from outside the building with the larger 2-1/2 inch hose streams rather than connecting 2-1/2 inch hose to the standpipe system inside the building.

The second floor of the building only houses fans and air handling equipment. However, even if a fire on the second floor requires 2-1/2 inch hoses, the fire brigade can advance hose lines up the exterior stairway to backup the 1-1/2 inch hose stations on the second floor.

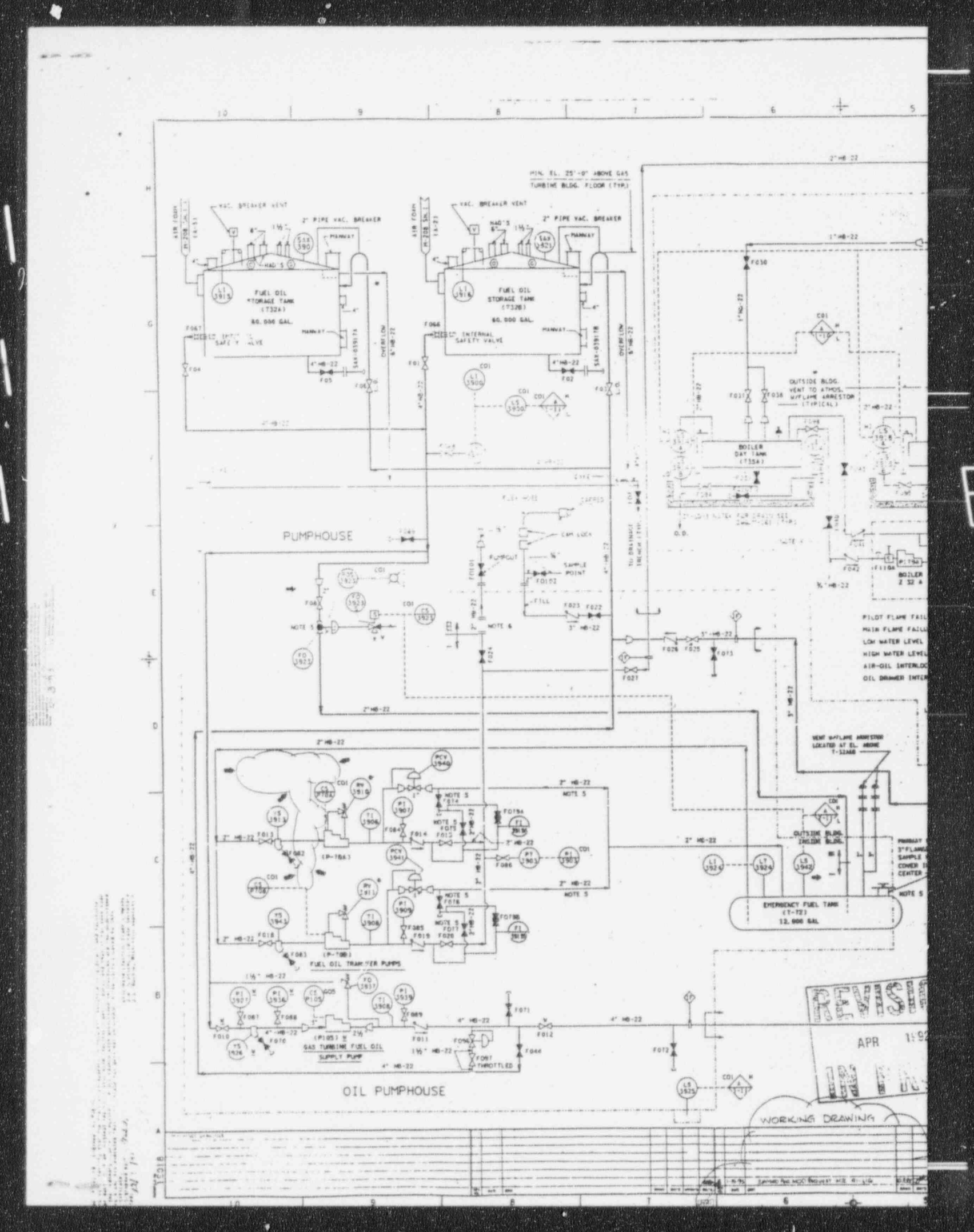
This design approach varies from typical fire protection guidelines provided in Appendix A to BTP APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," dated August 23, 1976 because of the expected type and severity of fires, size of the building, location of the building with respect to the main plant structure, entrances

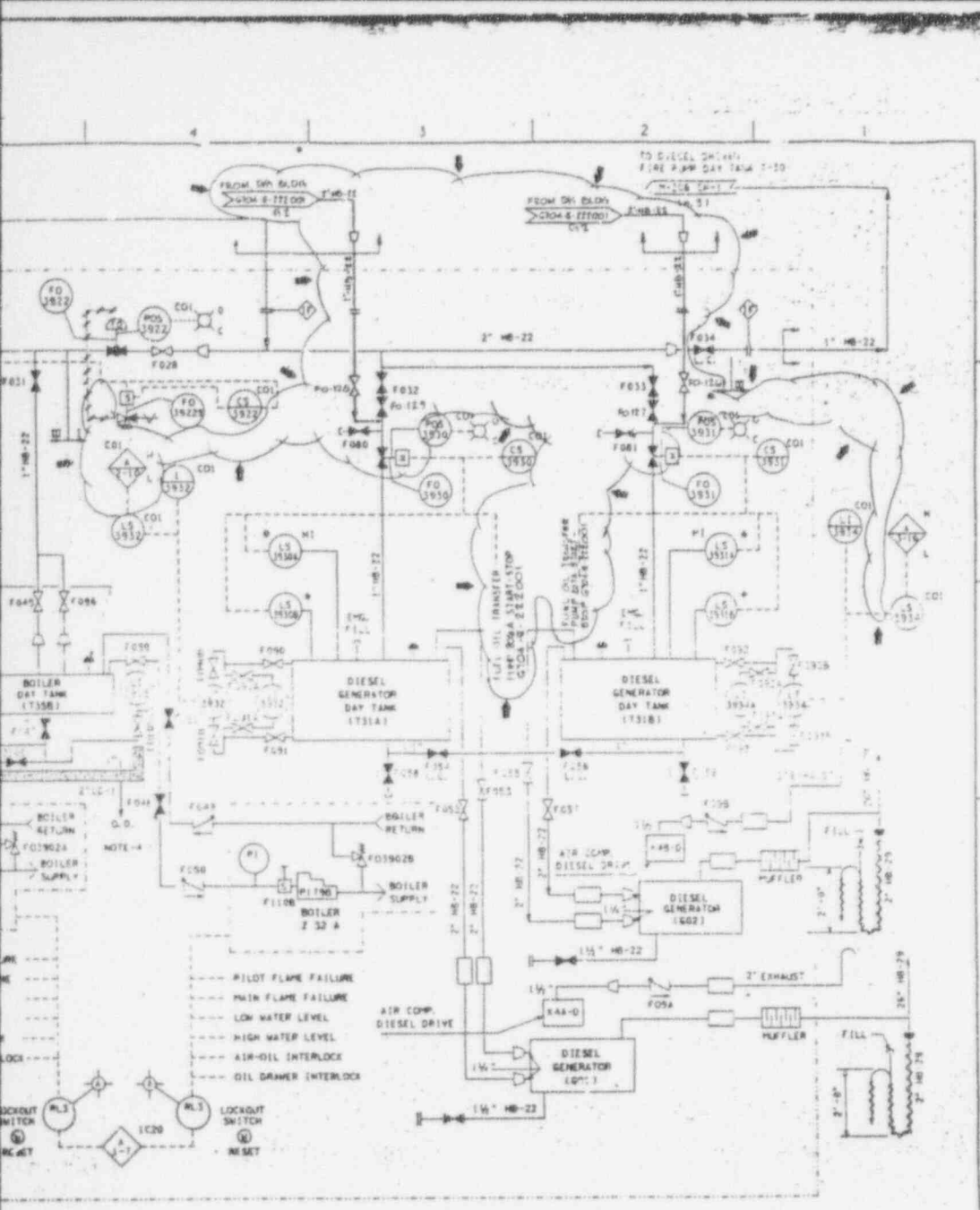
to the building and building layout. However, we have determined that this design best satisfies our fire fighting strategy for the building and intent of PBNP's fire protection commitments regarding provision for manual fire fighting capability covered under 10 CFR 50.48.

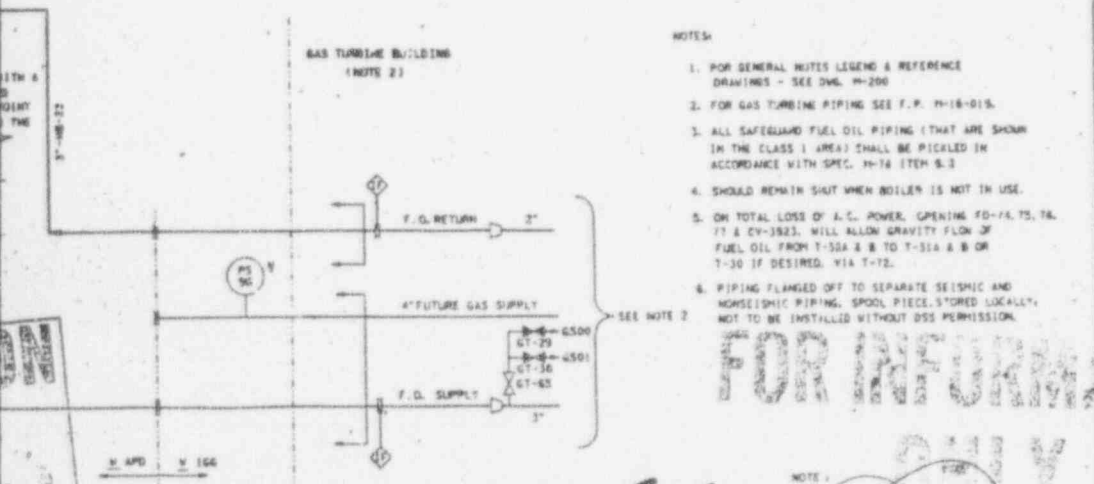
e. **Identify the standard used for the selection and spacing of portable fire extinguishers to be installed in the Diesel Generator Building (e.g., NFPA 10) and verify that extinguisher types and placements meet fire protection program commitments.**

NFPA 10-1990 was used in selecting the type and placement of portable fire extinguishers throughout the Diesel Generator Building. Ansul Model #A-20-E 10A/60BC (Foray) Multipurpose Dry Chemical Extinguishers will be located to provide extinguisher coverage throughout most of the building. Twenty pound carbon dioxide 10BC rated extinguishers will be provided for coverage of the switchgear rooms. Local hose stations will provide a portion of the A-Rated extinguishing capacity in accordance with Section 3-2.2 of NFPA 10.

This design meets the PBNP fire protection program commitments in accordance with 10 CFR 50.48.


FUEL OIL STORAGE TANK (T32A) 80,000 GAL.
FUEL OIL STORAGE TANK (T32B) 80,000 GAL.
2" PIPE VAC. BREAKER
VAC. BREAKER VENT
MANWAY
INTERNAL SAFETY VALVE
OVERFLOW
PUMPHOUSE
OIL PUMPHOUSE
BOILER DAY TANK (T35A)
OUTSIDE BLDG. VENT TO ATMOS. W/FLAME ARRESTOR (TYPICAL)
EMERGENCY FUEL TANK (T-72) 12,000 GAL
FUEL OIL TRANSFER PUMPS
GAS TURBINE FUEL OIL SUPPLY PUMP
THROTTLED
SAMPLE POINT
CAM LOCK
PUMPOUT
TO DRAINAGE TRENCH (TYP.)
VENT W/FLAME ARRESTER LOCATED AT EL. ABOVE T-32AB
MIN. EL. 25'-0" ABOVE GAS TURBINE BLDG. FLOOR (TYP.)
PILOT FLAME FAIL
MAIN FLAME FAIL
LOW WATER LEVEL
HIGH WATER LEVEL
AIR-OIL INTERLOC
OIL DRAWER INTER
APR
WORKING DRAWING





NOTES:

1. FOR GENERAL NOTES LEGEND & REFERENCE DRAWINGS - SEE DWG. M-200
2. FOR GAS TURBINE PIPING SEE F.P. M-16-015.
3. ALL SAFEGUARD FUEL OIL PIPING (THAT ARE SHOWN IN THE CLASS 1 AREA) SHALL BE PICKLED IN ACCORDANCE WITH SPEC. M-76 ITEM 6.3
4. SHOULD REMAIN SHUT WHEN BOILER IS NOT IN USE.
5. ON TOTAL LOSS OF A.C. POWER, OPENING FO-76, 75, 74, 77 & CV-3923, WILL ALLOW GRAVITY FLOW OF FUEL OIL FROM T-50A & B TO T-31A & B OR T-30 IF DESIRED. VIA T-72.
6. PIPING FLANGED OFF TO SEPARATE SEISMIC AND NONSEISMIC PIPING. SPOOL PIECE STORED LOCALLY, NOT TO BE INSTALLED WITHOUT DSS PERMISSION.

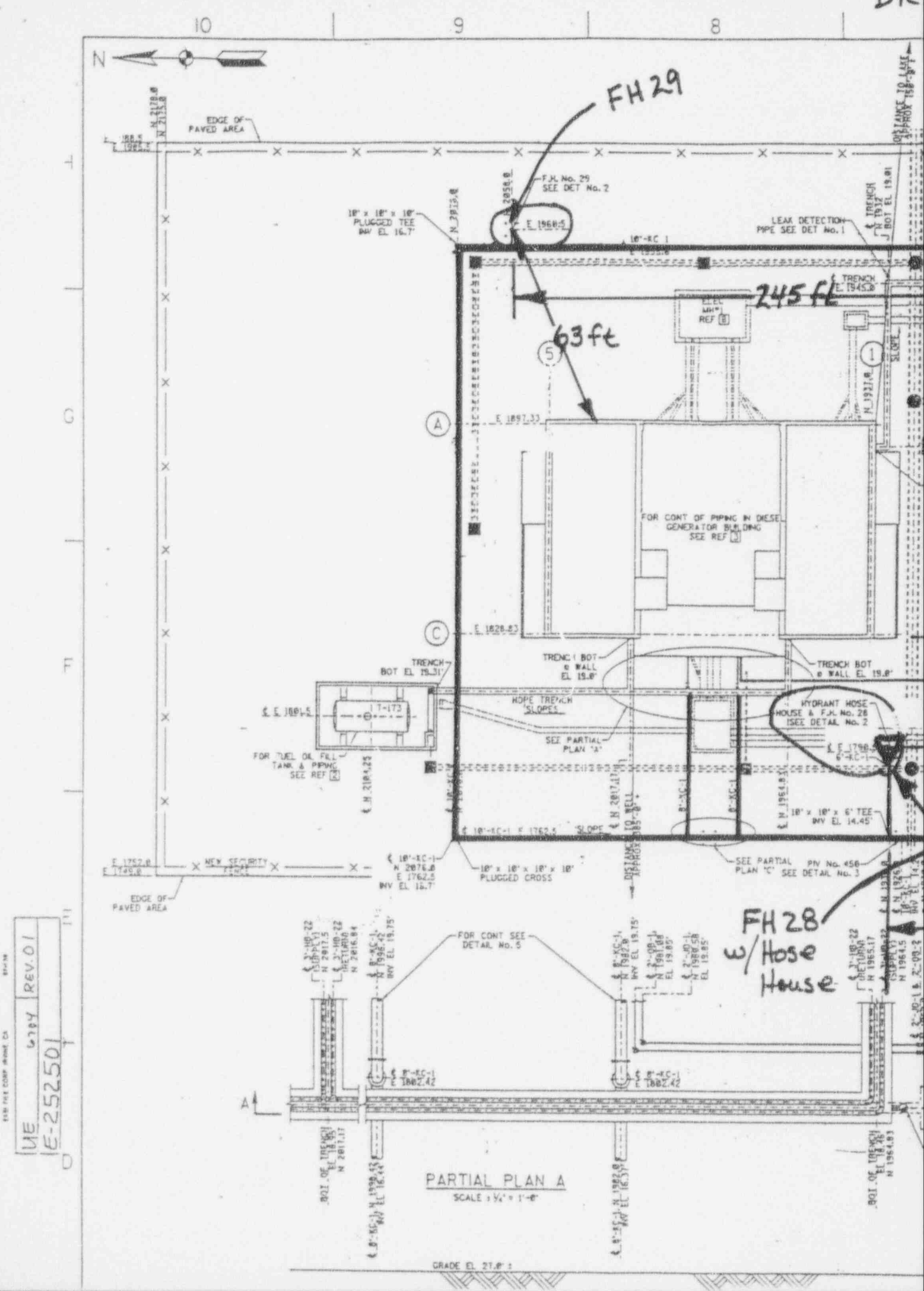
NOTE 1

THIS DRAWING REDRAWN FROM BECHTEL DRAWING NO. M-219 REV. 18 SHEET 1

9406240162-01

MICROFILM NO. 19018	WISCONSIN ELECTRIC	P & ID FUEL OIL SYSTEM POINT BEACH N.P. UNIT 1	A
C.A.D. FILE NO. 192			
E PB 01M FOK 00000124			

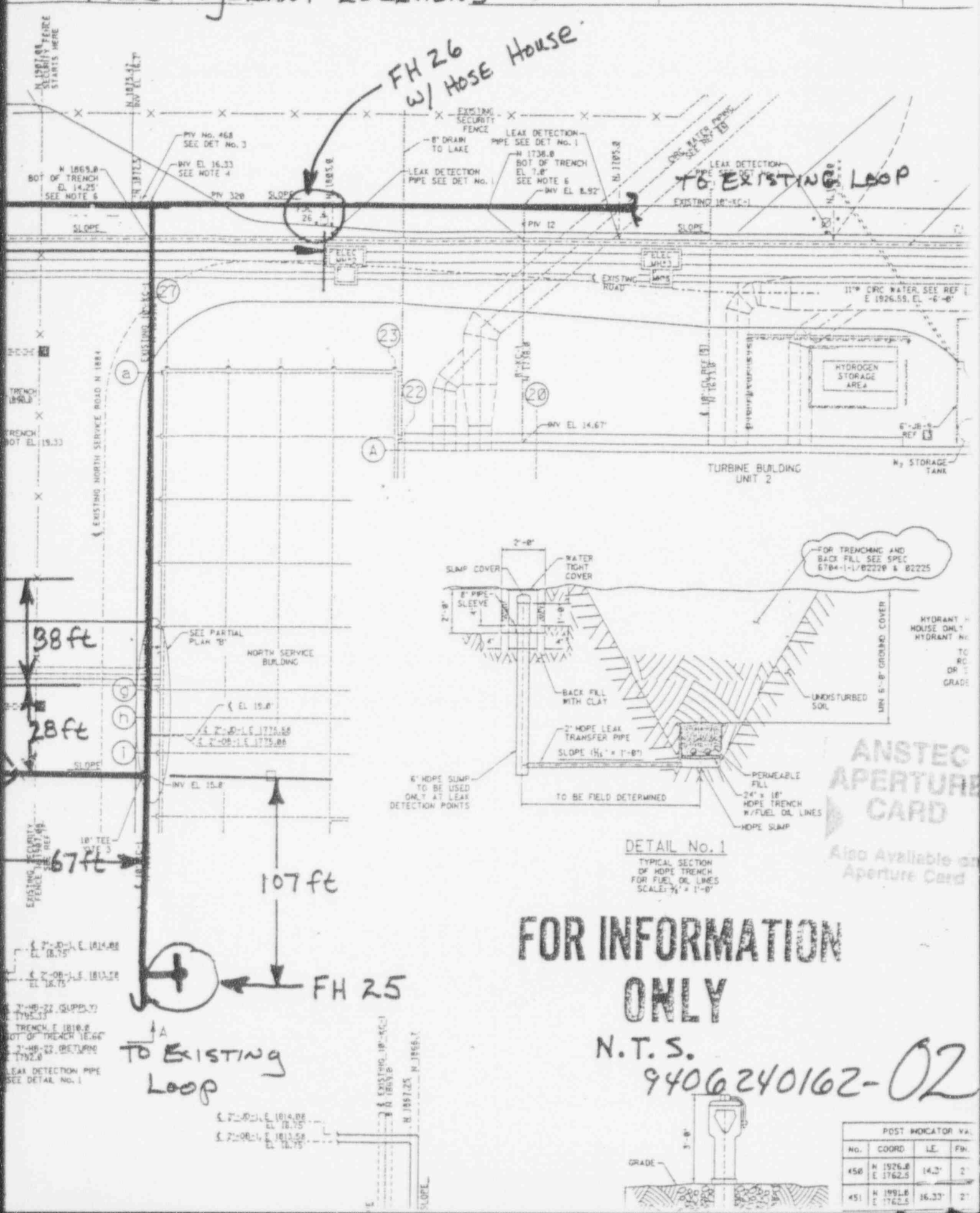
Die



10
9
8
N
FH29
FH 28 w/Hose House
245 ft
63 ft
EDGE OF PAVED AREA
F.H. No. 29 SEE DET No. 2
10" x 10" x 10" PLUGGED TEE INV EL 16.7'
LEAK DETECTION PIPE SEE DET No. 1
ELEC MH REF
FOR CONT OF PIPING IN DIESEL GENERATOR BUILDING SEE REF
TRENCH BOT EL 19.31'
HDPE TRENCH SLOPES
SEE PARTIAL PLAN 'A'
FOR FUEL OIL FILL TANK & PIPING SEE REF
T-173
HYDRANT HOSE HOUSE & F.H. No. 28 (SEE DETAIL No. 2
10" x 10" x 6" TEE INV EL 14.45'
NEW SECURITY FENCE
10" x 10" x 10" x 10" PLUGGED CROSS
SEE PARTIAL PLAN 'C'
PIV No. 456 SEE DETAIL No. 3
FOR CONT SEE DETAIL No. 5
PARTIAL PLAN A
SCALE : 1/4" = 1'-0"
GRADE EL 27.0' ±
UE
E-25250
REV. 01

Gen Generator Bldg

Fire Hydrant Locations



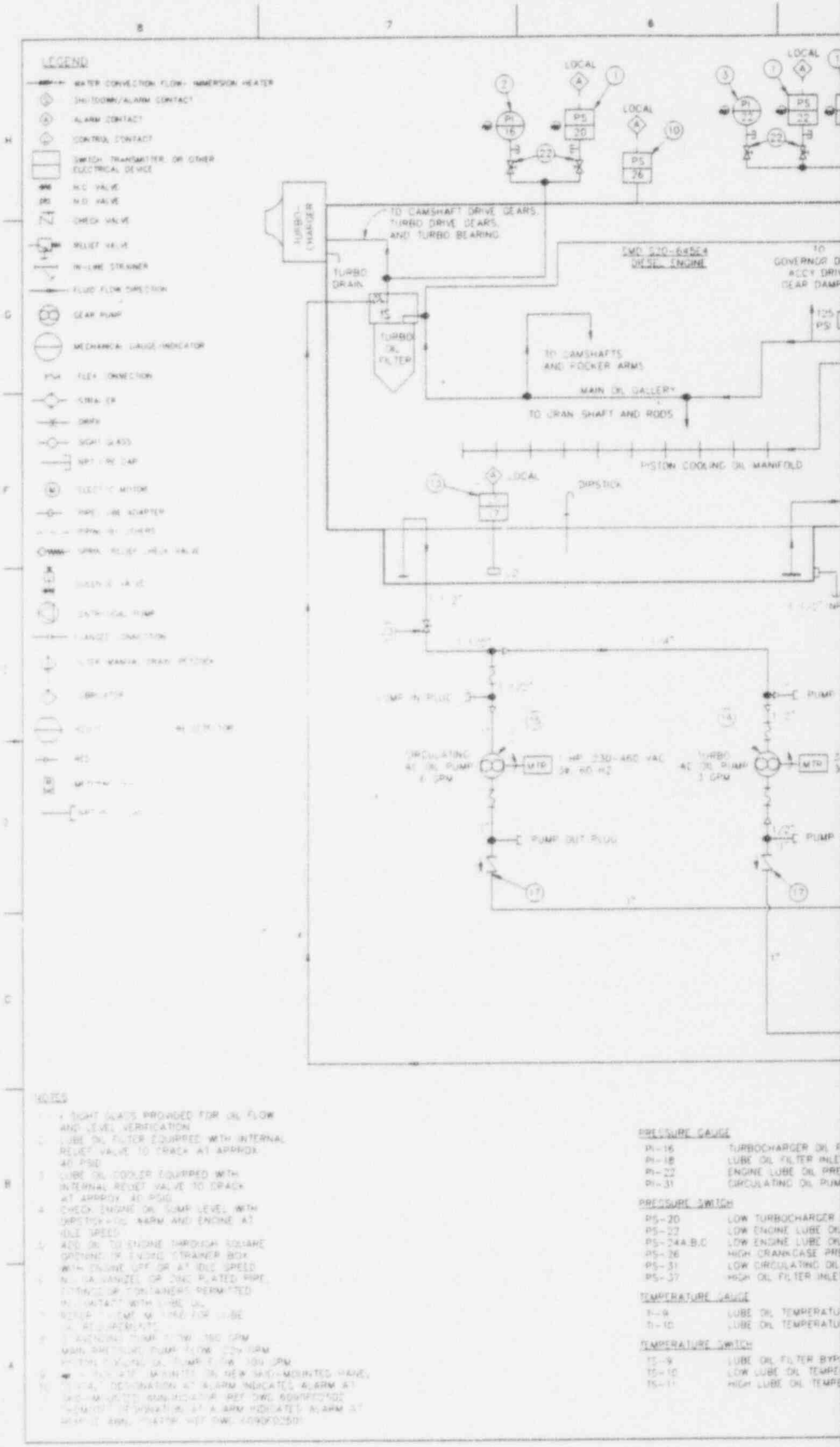
DETAIL No. 1
TYPICAL SECTION OF HDPE TRENCH FOR FUEL OIL LINES
SCALE: 3/4" = 1'-0"

FOR INFORMATION ONLY

N.T.S.

9406240162-02

POST INDICATOR VA			
No.	COORD	LE.	FIN
#50	N 1926.8 E 1762.5	14.3'	2'
#51	N 1991.8 E 1762.5	16.33'	2'

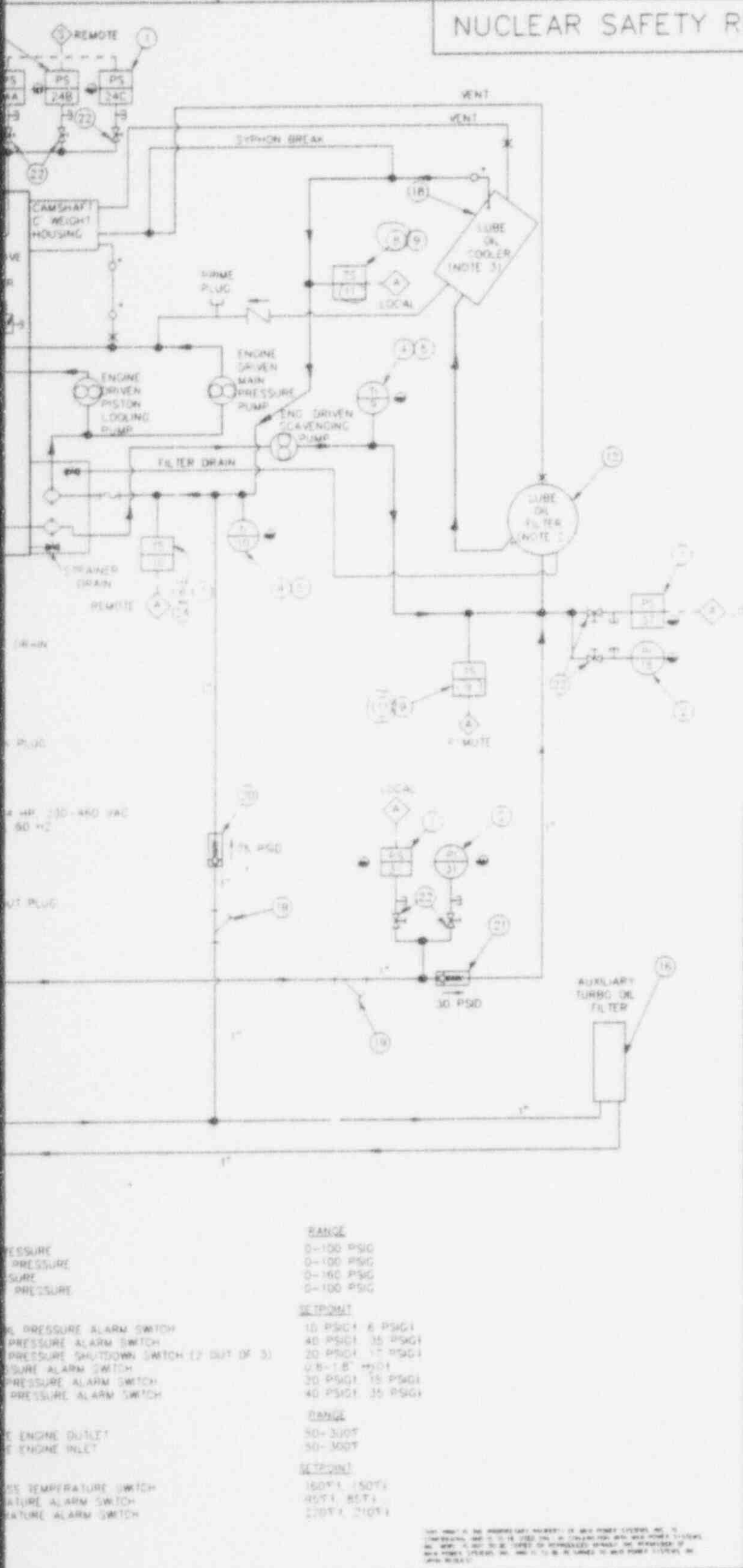


LEGEND
WATER CONVECTION FLOW- IMMERSION HEATER
SHUTDOWN/ALARM CONTACT
ALARM CONTACT
CONTROL CONTACT
SWITCH, TRANSMITTER, OR OTHER ELECTRICAL DEVICE
N.C. VALVE
N.O. VALVE
CHECK VALVE
RELIEF VALVE
IN-LINE STRAINER
FLUID FLOW DIRECTION
GEAR PUMP
MECHANICAL GAUGE-INDICATOR
FLEX CONNECTION
ORIFICE
SIGHT GLASS
ELECTRIC MOTOR
CENTRIFUGAL PUMP
LOCAL
TURBOCHARGER
TO CAMSHAFT DRIVE GEARS, TURBO DRIVE GEARS, AND TURBO BEARING
TURBO DRAIN
TURBO OIL FILTER
EMD 20-645E4 DIESEL ENGINE
TO CAMSHAFTS AND ROCKER ARMS
MAIN OIL GALLERY
TO CRANK SHAFT AND RODS
PISTON COOLING OIL MANIFOLD
DIPSTICK
PUMP IN PLUG
CIRCULATING AC OIL PUMP 6 GPM
1 HP, 230-460 VAC 3Ø, 60 HZ
TURBO AC OIL PUMP 3 GPM
PUMP OUT PLUG
NOTES
1. 4 SIGHT GLASS PROVIDED FOR OIL FLOW AND LEVEL VERIFICATION
2. LUBE OIL FILTER EQUIPPED WITH INTERNAL RELIEF VALVE TO CRACK AT APPROX 40 PSID
3. LUBE OIL COOLER EQUIPPED WITH INTERNAL RELIEF VALVE TO CRACK AT APPROX. 40 PSID
4. CHECK ENGINE OIL SUMP LEVEL WITH DIPSTICK-OIL WARM AND ENGINE AT IDLE SPEED
5. ADD OIL TO ENGINE THROUGH SQUARE OPENING OF ENGINE STRAINER BOX WITH ENGINE OFF OR AT IDLE SPEED
PRESSURE GAUGE
PI-16 TURBOCHARGER OIL P
PI-18 LUBE OIL FILTER INLET
PI-22 ENGINE LUBE OIL PRE
PI-31 CIRCULATING OIL PUMP
PRESSURE SWITCH
PS-20 LOW TURBOCHARGER
PS-22 LOW ENGINE LUBE OIL
PS-24A,B,C LOW ENGINE LUBE OIL
PS-26 HIGH CRANKCASE PRE
PS-31 LOW CIRCULATING OIL
PS-37 HIGH OIL FILTER INLET
TEMPERATURE GAUGE
TI-9 LUBE OIL TEMPERATUR
TI-10 LUBE OIL TEMPERATUR
TEMPERATURE SWITCH
TS-9 LUBE OIL FILTER BYPA
TS-10 LOW LUBE OIL TEMPE
TS-11 HIGH LUBE OIL TEMPE

E D C B

NUCLEAR SAFETY RELATED

REVISIONS				
4634	-	ORIGINAL ISSUE	05 APR 93	ABERNATHY
5041	A	REVISED AS NOTED	15 NOV 93	ABERNATHY
5174	B	REVISED AS NOTED	[illegible]	[illegible]



FOR INFORMATION ONLY

ANSTEC APERTURE CARD

Also Available on Aperture Card

24	406-F	FLANGE THERMOWELL		MKW/PS A02024	1
23	314	BALL VALVE 1 1/2" NPT		EMD 8463756	1
22	1104-12	ISOLATION VALVE 1/4"		WHITEY SS-42S4	11
21	316-1	30 PSID RELIEF CHECK VALVE		EMD 8470730	1
20	316-2	75 PSID RELIEF CHECK VALVE		EMD 9521844	1
19	318	WYE STRAINER		EMD 8280951	2
18		LUBE OIL COOLER		EMD 8437992	1
17	315-2	SWING CHECK VALVE		STOCKHAM B320B-1"	2
16		AUXILIARY TURBOCHARGER FILTER		EMD 8379120	1
15	310	CIRCULATING OIL PUMP ASSEMBLY		6076DC3006	1
14	312	SOAKBACK OIL PUMP ASSEMBLY		6076D03003	1
13		LOW OIL LEVEL SWITCH	LS-17	EMD 8445672	1
12		LUBE OIL FILTER		EMD 8362640	1
11	337-1	TEMPERATURE SWITCH	TS-9	SQ D 9025-GXW3-A6H10	1
10		CRANKCASE PRESSURE SWITCH	PS-26	EMD 8362040	1
9	406-5	TEMPERATURE SWITCH THERMOWELL, BRASS		SQ D 9049-A34	2
8	337-2	TEMPERATURE SWITCH	TS-11	SQ D 9025-GXW4-A6H10	1
7	406-4	TEMPERATURE SWITCH THERMOWELL, BRASS		SQ D 9049-A30	1
6	406-2	TEMPERATURE SWITCH	TS-10	SQ D 9025-GIW2-H10	1
5	1104-30	TEMPERATURE GAUGE THERMOWELL, BRASS		ASHCROFT [illegible]	2
4	1104-18	TEMPERATURE GAUGE, 50-300°F	TI-9,10	[illegible]	2
3	1104-16	PRESSURE GAUGE, 0-160 PSIG	PI-22	ASHCROFT [illegible]	1
2	1104-15	PRESSURE GAUGE, 0-100 PSIG	PI-16,18,31	ASHCROFT [illegible]	3
1	1104-13	PRESSURE SWITCH, DPDT	PS-[illegible]	SQ D 9012-GAW24	7
ITEM NO		NOMENCLATURE OR DESCRIPTION			

LIST OF MATERIAL OR PARTS LIST

WISCONSIN ELECTRIC POWER COMPANY
POINT BEACH NUCLEAR PLANT

MKW POWER SYSTEMS, inc.

LUBE OIL SYSTEM PIPING AND INSTRUMENTATION DIAGRAM

SIZE	CODE IDENT NO	DRAWING NO	REV
F	16505	6090F03001	B

FILE NAME 90030011

9406240162-03