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March 5, 1985

United States Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Mr. George W. Knighton, Chief
Licensing Branch 3
Office of Nuclear Reactor Regulation

SUBJECT: Beaver Valley Power Station - Unit No. 2
Docket No. 50-412
PSB Mechanical Responses

Gentlemen:

This letter forwards revised PSB Mechanical responses which were accepted at a meeting held or February 11, 1985, and an informal meeting held on February 28, 1985. FSAR changes described in these revised responses will be incorporated in an upcoming amendment. The following responses are attached: 430.25, 430.55, 430.59, 430.107, 430.117, 430.122, 430.123, 430.125, 430.126, and GDC 5 for communications systems.

Please note, the response to question 430.25 is being revised in response to question 430.54.

DUQUESNE LIGHT COMPANY

By E. F. Kurtz Jr. for
E. J. Woolever
Vice President

GHO/wjs
Attachment

cc: Mr. B. K. Singh, Project Manager (w/a)
Mr. G. Walton, NRC Resident Inspector (w/a)

SUBSCRIBED AND SWORN TO BEFORE ME THIS 5th DAY OF March, 1985.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

B001 /1

COMMONWEALTH OF PENNSYLVANIA)
) SS:
COUNTY OF ALLEGHENY)

The Manager, Regulatory Affairs, Eugene F. Kurtz, Jr., being first duly sworn, deposes, and says: that he is the Manager, Regulatory Affairs, Nuclear Construction Division, of Duquesne Light Company; with legal authority to sign official correspondence on behalf of the Vice President - Nuclear Construction Division, Earl J. Woolever, in relation to licensing for Beaver Valley Power Station, Unit 2 and therefore authorized to submit the foregoing on behalf of the applicant.

3-5-85
Date

E. F. Kurtz Jr
Manager, Regulatory Affairs

Sworn and subscribed before me, this 5th day of March, 1985.

Anita Elaine Reiter
Notary Public

ANITA ELAINE REITER, NOTARY PUBLIC
ROBINSON TOWNSHIP, ALLEGHENY COUNTY
MY COMMISSION EXPIRES OCTOBER 20, 1986

NRC Letter: August 31, 1983

Question 430.25 (SRP 8.3.1)

Section 6.4.2 of IEEE Standard 387-1977 requires, in part, that the load acceptance test consider the potential effects on load acceptance after prolonged no load or light load operation of the diesel generator. Provide the results of load acceptance tests or analysis that demonstrate the capability of the diesel generator to accept the design accident load sequence after prolonged no load operation. This capability should be demonstrated over the full range of ambient air temperatures that may exist at the diesel engine air intake. If this capability cannot be demonstrated for minimum ambient air temperature, conditions, describe design provision that will assure an acceptable engine air intake temperature during no load operation.

Response:

In accordance with Section 8.3.1.1.15, the emergency diesel generator is capable of operating for 24 hours at rated speed, no load, without any deterioration in its load acceptance or load carrying capability. The emergency diesel generator manufacturer (Colt Industries) has performed an analysis which confirms that the only limitation to prolonged (greater than 24 hours) operation, at no load or light load (less than 20 percent of rated load) with the combustion air ambient temperature range of -17°F to 102°F, is the accumulation of combustion and lubrication products in the exhaust system.

The manufacturer recommends that the engine be run at or above 50-percent load for at least one hour in each 24 hour period to minimize the accumulations and has included statements to cover this extended operation as indicated above in their operation instruction manuals. As stated in the response provided for Question 430.54, routine testing of the emergency diesel generator is not performed at less than 25 percent of rated load. This is ensured by the appropriate station operating procedures.

(INCLUDING TROUBLE SHOOTING)

NRC Letter: September 19, 1983

Question 430.55 (Section 8.3)

The availability on demand of an emergency diesel generator is dependent upon, among other things, the proper functioning of its controls and monitoring instrumentation. This equipment is generally panel mounted and in some instances the panels are mounted directly on the diesel generator skid. Major diesel engine damage has occurred at some operating plants from vibration induced wear on skid mounted control and monitoring instrumentation. This sensitive instrumentation is not made to withstand and function accurately for prolonged periods under continuous vibrational stresses normally encountered with internal combustion engines. Operation of sensitive instrumentation under this environment rapidly deteriorates calibration, accuracy and control signal output.

Therefore, except for sensors and other equipment that must be directly mounted on the engine or associated piping, the controls and monitoring instrumentation should be installed on a free standing floor mounted panel separate from the engine skids, and located on a vibration free floor area. If the floor is not vibration free, the panel shall be equipped with vibration mounts.

Confirm your compliance with the above requirement or provide justification for noncompliance (SRP 8.3.1, Parts II and III).

Response:

Controls and monitoring equipment, which are not required to be directly mounted on the engine or associated piping, will have their vibration levels monitored during the diesel generator testing period prior to plant operation to ascertain if these vibration level values are within the acceptable vibration level values furnished by the vendor.

Should these vibration values exceed the vendor's recommended values, then the subject equipment will be removed from the engine skid and mounted in a free-standing or wall-mounted seimsically qualified configuration that yields acceptable vibration levels for the equipment. The vibration levels for relocated equipment will be measured to confirm that acceptable values have been achieved.

NRC Letter: September 19, 1983

Question 430.59 (SRP 9.5.2)

In Section 9.5.2.2.1.? of the FSAR, you state that during emergency or accident conditions the calibration jack "...system can be used as an alternate means to relay messages between different areas of the plant." Decribe how the relaying or messages using the calibration jack system will be accomplished for those areas specified in Request 430.57 above. The description should include the maximum number of plant personnel needed to relay the messages, the procedures, if any, that will be used in setting-up and using the relay, and assurances that adequate station personnel will be onsite in the event that the relay system must be used (SRP 9.5.2, Part II).

Response:

The calibration jack system is an installed network of phone jacks and cabling with power supplies provided across the voice circuits. Two voice circuits are available at each jack station. Headset/amplifier units can be connected to the network at any jack location, enabling communications to take place between two or more jack station locations.

In the event of an emergency, the jack system could be called upon as an additional or alternate means of communicating between preselected locations in the plant. For example, if a fire situation occurred in a plant building, a convenient jack station at the fire brigade staging area could be designated and an individual dispatched to the location to establish a direct communication link to the main control room or emergency shutdown panel area. It is not envisioned that this would be the primary means of communication, but could be used in addition to or in place of page party, radio, or telephone.

Section 9.5.2.2.1.2, which states that during emergency or accident conditions the calibration jack "...system can be used as an alternate means to relay messages between different areas of the plant," has been revised to, "...system can be used as an alternate means of communications between two or more areas of the plant." SRP 9.5.2 is devoted to the design of communications systems and provides no criteria for such items as staffing.

NO CHANGES THIS PAGE
FOR INFO ONLY

NRC Letter: September 19, 1983

Question 430.107 (Section 9.5.6)

You state in Section 9.5.6.1 of the FSAR that "Each independent starting system is designed to be capable of starting the engine five times from a low alarm setpoint without recharging the starting air tanks. No information has been provided on system pressure alarms, compressor cut-in or cut-out. Provide the following:

1. Expand Section 9.5.6 of your FSAR to clarify the statement regarding the capability of the air start system of five starting cycles without recharging the air receivers. A successful diesel generator start is defined as the ability of the air start system to crank the diesel engine to the manufacturer's recommended RPM, to enable the generator to reach voltage and frequency and begin load sequencing in 10 seconds or less. With the receiver at low pressure alarm set point and without recharging provide a tabulation of receiver pressure and diesel engine starting times for each of the five consecutive starts. In addition, describe the sequence of events when an emergency start signal exists. State whether the diesel engine cranks until all compressed air is exhausted, or cranking stops after a preset time to conserve the diesel starting air supply. Describe the electrical features (including interlocks) of this system in Section 8.0 of the FSAR (in the appropriate subsection).

2. Provide the pressures at which the following alarms and controls actuate: low pressure alarm, low low pressure alarm, and high pressure alarm, and air compressor cut-in and cut-out pressures (SRP 9.5.6, Part III).

Response:

Refer to revised Sections 9.5.6.1 and 9.5.6.2, Amendment 4.

For sequence of events when an emergency start signal exists, refer to revised Section 9.5.6.5, Amendment 4. Cranking of the diesel is set for 10 seconds upon receipt of a start signal If the engine fails to start within this time, the start failure reset pushbutton must be depressed locally in an attempt to start the diesel again. The diesel starting air system is capable of providing a minimum of five starting attempts with the diesel starting air receiver pressure at 425 psig.

The NRC requested clarification of the starting air tank low pressure alarm setpoint with regard to the capability to start the diesel once a low pressure alarm condition exists. This concern was raised at a meeting between the NRC (Power Systems Branch), DLC, and SWEC on March 6, 1984.

Refer to revised Tables 9.5-10 and 9.5-11, Amendment 7, for low pressure alarm setpoints, diesel starting times, and associated system pressures.

The low pressure alarm setpoint is 375 psig. Based on the data presented in Table 9.5-11, one receiver can start the diesel four times (in less than 10 seconds) after it has reached its alarm setpoint. For two receivers in service, the starting capability would be enhanced such that more starts would be available.

The low pressure alarm setpoint is 375 psig for each air receiver; in the case of a compressor failure or a system leak causing the low pressure alarm point to be reached for ONE air receiver, the OTHER air receiver for that diesel generator would still be at normal pressure (395 - 425 psig). Based on the data presented in Table 9.5-11, one receiver can start the diesel five times (in less than 10 seconds) from the low point in its normal operating range. For two receivers in service, the starting capability would be enhanced such that more starts would be available.

NRC Letter: September 19, 1983

Question 430.117 (Section 9.5.7)

You state in Section 9.5.7.1 of the FSAR under "specific design criteria" that "the temperature of the lubricating oil is automatically maintained above a minimum value by means of an independent recirculation loop including its own pump and heater, to enhance first try starting reliability of the engine in the standby condition." The rocker arm lubrication system is an independent subsystem of the diesel lube oil system which is connected to the main system by a float valve in the rocker arm oil reservoir. From the information available it appears that the lube oil in the rocker arm lubrication system will never be preheated unless the oil level is low enough to open the float valve. If this is the case what means have you provided for preheating the rocker arm lubricating oil or justify why preheating is unnecessary. (Refer to Question 430.128 for conditions when preheating may be necessary.) (SRP 9.5.7, Parts II and III).

Response:

The rocker arm lubrication system is not preheated. The first-try starting reliability of the diesel engine without rocker arm lube oil preheating has been demonstrated by the test program described in Section 8.3.1.1.15.

Because of the large total surface area of crankshaft and connecting rod journal bearings, when compared to the small total surface area of rocker arm bushings, it is evident that rocker arm resistance is an insignificant contributor to cranking resistance and that heating of crankcase oil alone is sufficient. SRP 9.5.7 recognizes the insignificance of rocker arm lube oil heating by stating that the design should contain "an independent circulation loop to maintain the temperature of the crankcase oil above a minimum value during the standby mode." The BVPS-2 diesel generator buildings are heated to provide favorable ambient temperature conditions, which further assures proper rocker arm oil ~~viscosity~~ temperature for reliable starting (refer to the response to question 430.127)

The emergency diesel generator engines are designed for building ambient temperatures as low as +10°F. In accordance with this design criterion, the engine manufacturer's instructions specify that the engine be lubricated with SAE 30 oil. (Specifications of SAE 30 oil require a maximum pour point temperature of 0°F.)

NRC Letter: September 19, 1983

Question 430.122 (Section 9.5.8)

Provide the results of an analysis that demonstrates that the function of your diesel engine air intake and exhaust system design will not be degraded to an extent which prevents developing full engine rated power or cause engine shutdown as a consequence of any meteorological or accident condition. Include in your discussion the potential and effect of fire extinguishing (gaseous) medium, recirculation of diesel combustion products, or other gases including products of combustion due to a fire that may intentionally or accidentally be released on site, on the performance of the diesel generator (SRP 9.5.8, Parts II and III).

Response:

The effect of fire extinguishing (CO_2) medium released in the diesel generator building will be addressed in the responses to Questions 430.124 and 430.129. The effects of products of combustion due to a fire will be addressed in the response to Question 430.126.

INSERT A PAGE 430.122-1A

An analysis has been performed to evaluate the effects of accidental releases of gases stored onsite and the recirculation of diesel exhaust gases on the function of the emergency diesel generators.

The accidental release of gases or liquids capable of producing a gaseous cloud on the BVPS-2 site was evaluated in terms of their potential to reduce the oxygen content of the diesel intake air below acceptable levels. The onsite stored chemicals and their quantities are shown in Table 2.2-9 and their locations are indicated on Figure 6.4-5. Since the carbon dioxide tanks are stored inside the auxiliary building (two 10-ton tanks) and the turbine building (7.5-ton tank), any accidental releases will be confined within the buildings and released over a period of time through the normal ventilation system from rooftop vent. Therefore, the effects of carbon dioxide releases from these sources on diesel generator performance is not significant. The remaining onsite chemicals were analyzed by calculating the maximum concentration expected to occur at the diesel air intakes using the conservative methodology outlined in NUREG-0570, "Toxic Vapor Concentrations in the Control Room Following a Postulated Accidental Release" (Section 2.2.3.1.2).

In a postulated accident the entire contents of the largest single storage container are released, resulting in a vapor cloud or plume which is conservatively assumed to be transported by the wind directly toward the diesel generator air intakes. The most conservative meteorological condition is assumed for the calculation, which consists of Pasquill Class G stability, a wind speed of 0.5 m/sec, and an ambient temperature of 40°C. It is further assumed that the release point and diesel air intakes are both at ground

INSERT A

The effects of products of combustion due to a fire in one diesel generator cubicle is addressed in the response to ~~[illegible]~~ Question 430.124. The effects of products of combustion ~~from~~ due to a fire in station service transformer 2A, in the oil storage laydown area or in oil separator no. 22 are addressed in the response to Question 430.126. The effects of products of combustion due to fires in all other areas are less severe than those considered in Questions 430.124 and 430.126. Buildings north of the diesel generators (containment and safeguards) have no ventilation openings from which smoke could escape. The ~~service~~ buildings south and west of the diesel generators (service, ~~aux~~ turbine and south office and shops) have no ventilation openings which are closer to the diesel combustion air intake than the diesel generator ventilation exhaust vent addressed in Q 430.124. ~~[illegible]~~ Smoke escaping from ventilation openings in these buildings would be more greatly dispersed and therefore would have a less severe effect than the case addressed in Q 430.124.

level and that the puff or plume centerline directly impacts the intake. Only the outside air concentration of each chemical is calculated with no further dilution of the chemical inside the diesel generator building being considered. In the case of nitrogen and hydrogen releases, the presence of the turbine building directly in the path of the puff (see Figure 6.4-5) is accounted for by using the expression for building wake effect from Regulatory Guide 1.145:

$$\chi/Q = \frac{1}{\bar{u}\,(\pi\sigma_y\sigma_z + A/2)} \qquad (430.122\text{-}1)$$

where χ is concentration (g/m^3), Q is emission rate (g/sec), $\bar{u}$ is mean wind speed (m/sec), σ_y and σ_z are lateral and vertical dispersion coefficients (m), and A is the building cross-sectional area normal to the wind direction. This expression, combined with the dispersion equation without building wake effect, included ($\chi/Q = 1/\bar{u}\pi\sigma_y\sigma_z$) and yields the correction factor $(1 + A/2\pi\sigma_y\sigma_z)^{-1}$ to the concentration calculated by the NUREG-0570 methodology which does not consider building wake effects. A building area of 1519 m^2 was used in the calculation.

The result of the analysis is shown in Table 430.122-1, which indicates the maximum chemical concentrations at the diesel air intake in g/m^3 and percent by volume, and the corresponding oxygen concentrations of the intake air assuming an ambient air oxygen content of 21 percent by volume. Based on a lower limit of 17.5 percent oxygen by volume in the intake air for full engine rated power to be achieved, accidental releases of gases stored onsite will not degrade the intake air to an extent that diesel operation will be adversely affected.

Likewise, an analysis of the recirculation of diesel exhaust from the roof in the lee of the diesel generator building indicates no impairment of the diesel generator operation. The analysis estimates diesel exhaust concentrations at the air intakes on the downwind side of the diesel generator building based on wind tunnel tests performed by Wilson (1976) which produced K isopleths for three different building shapes and several roof exhaust locations, where $K = C\bar{u}L^2/Q$, and where C = concentration, $\bar{u}$ = wind speed, L = length scale, and Q = emission rate. The K isopleths represent the case of no plume rise, which is the most conservative case. Even though the diesel exhaust is directed downward toward the roof, the exhaust temperature of 1,000°F will most likely result in some buoyancy-induced plume rise, which leads to added conservatism of the analysis. The wind tunnel boundary layer is typical of a suburban or lightly built-up urban area which is reasonably representative of the BVPS-2 site area.

Based on the K isopleths for the building shape and exhaust vent locations most representative of the diesel generator building exhaust and intake design (Figure 7 in Wilson, 1976), a K value of 1 was conservatively chosen for the analysis. The concentration of diesel exhaust (C) at the air intakes is then C = Q/UA, where $A = L^2$ (building area normal to the wind). Based on a design exhaust flow of 42 m^3/sec (Q), a building area of 319 m^2 (A), and an assumed 10 m/sec wind speed (U) for downwash conditions, the diesel exhaust concentration at the air intakes is 1.3 percent by volume. This concentration translates to a 20.7 percent oxygen content of the intake air, which is well above the minimum percentage of 17.5.

Reference for Question 430.122

Wilson, D.J. 1976. Contamination of Air Intakes from Roof Exhaust Vents. ASHRAE Transactions 82, Part 1, 1024.

IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6″

IMAGE EVALUATION TEST TARGET (MT-3)

150mm

6"

TABLE 430.122-1

ESTIMATED CHEMICAL CONCENTRATIONS AT DIESEL GENERATOR AIR INTAKES

Chemical	Diesel Intake Concentration (g/m^3)	Diesel Intake Concentration (% by Volume)	Oxygen Content (% by Volume)
Ammonium hydroxide	24.8	1.8	20.6
Nitrogen	171.9	15.8	17.7
Hydrogen	4.5	5.8	19.8
Chlorine	201.7	7.3	19.5
Hydrazine	0.1	0.01	21.0
Morpholine	0.1	1.5×10^{-3}	21.0
Sulfuric acid	2.4×10^{-5}	6.3×10^{-7}	21.0

NRC Letter: September 19, 1983 1.9

Question 430.123 (Section 9.5.8) 1.13

Discuss the provisions made in your design of the diesel engine 1.14
combustion air intake and exhaust system to prevent possible 1.15
clogging, during standby and in operation, from abnormal climatic
conditions (heavy rain, freezing rain, dust storms, ice and snow 1.16
drifts, and snow) that could prevent operation of the diesel
generator on demand (SRP 9.5.8, Parts II and III). 1.17

Response: 1.18

Abnormal climatic conditions to be considered at BVPS-2 would include 1.19
heavy rain, freezing rain, ice and snow drifts, and snow. Heavy 1.21
rain, freezing rain, and snow cannot impair the functioning of diesel
intakes and exhausts because of the downward facing openings of the 1.22
labyrinths which are designed to protect the exhausts and intakes
from tornado missiles. Drifting snow cannot restrict intakes due to 1.24
their elevation, which is greater than 25 ft. above the ground (refer
to Figure 3.8-43). Blockage of diesel exhausts by drifting snow is 1.26
prevented by the location and configuration of the concrete hoods
(refer to Figure 3.8-43). Since each hood has two downward facing 1.28
openings, one on the north side of the center supporting pedestal and
one on the south side of the pedestal, blowing snow from the north or 1.29
south will not significantly drift at least one opening on each 1.30
diesel exhaust because of shielding by the pedestals and/or the
adjacent diesel exhaust hood. Snow blown from the east or west will 1.31
not drift significantly because the north opening of the "B" diesel
exhaust and the south opening of the "A" diesel exhaust permit 1.32
blowing snow to freely pass under the overhanging openings. In 1.33
addition, the area of the openings (over 50 ft²) far exceeds the area
of the exhaust pipe (less than 8 ft²) and would permit significant 1.34
screen blockage before diesel performance would be impacted. Snow 1.35
depth can reach 51 inches average at the diesel exhausts and still
maintain the 8 ft² total opening area, assuming the exhaust flow does 1.36
not blow or melt nearby snow (which it certainly would).

430.123-1

IT CAN EASILY BE SEEN FROM FIGURE 430.123-1 THAT WINDS FROM OTHER DIRECTIONS ALLOW CONSIDERATION OF A COMBINATION OF THE CHARACTERISTICS WHICH PREVENT SIGNIFICANT NORTH-SOUTH OR EAST-WEST DRIFTING.

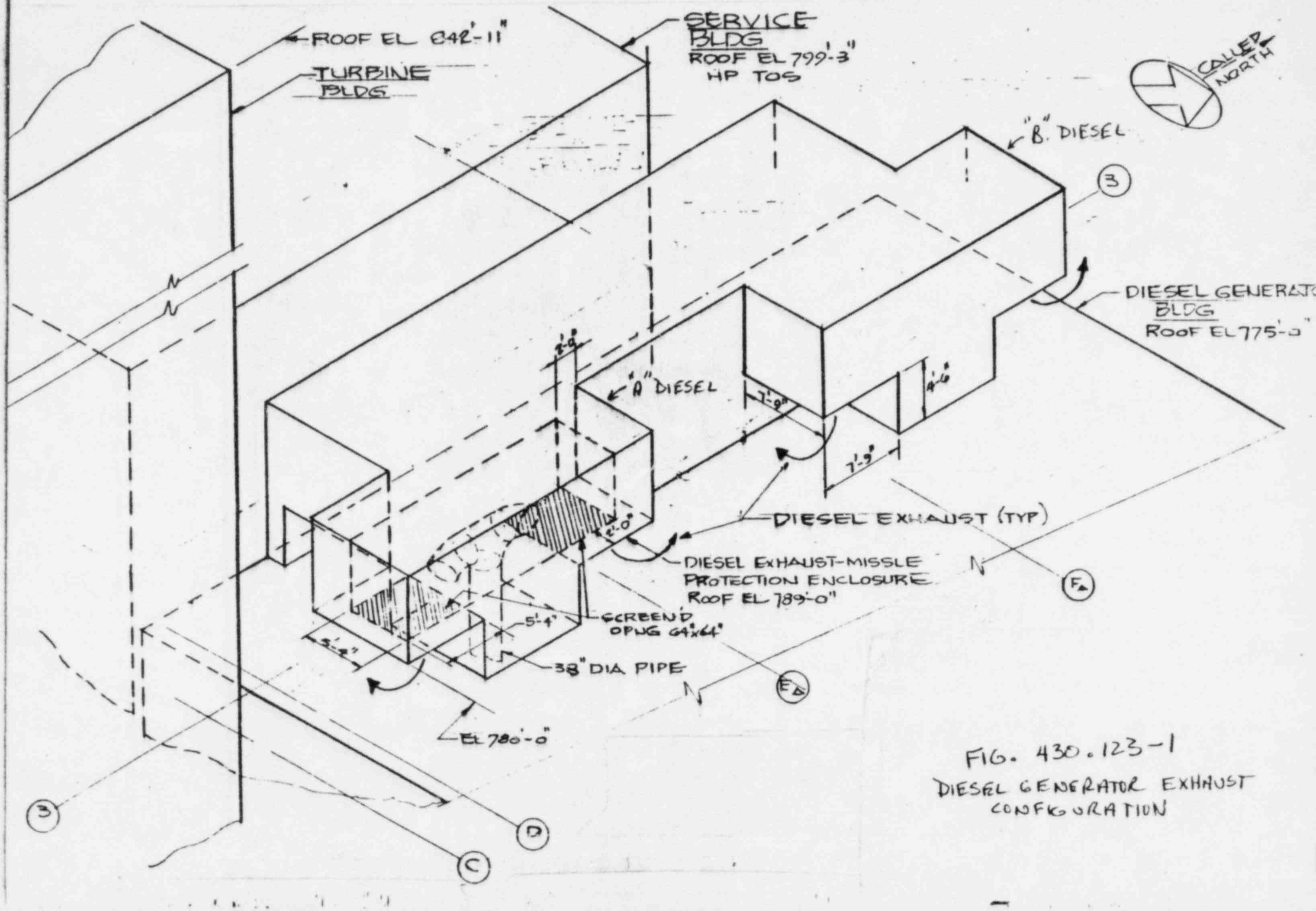

FIG. 430.123-1

DIESEL GENERATOR EXHAUST CONFIGURATION

NRC Letter: September 19, 1983

Question 430.125 (Section 9.5.8)

Experience at some operating plants has shown that diesel engines have failed to start due to accumulation of dust and other deleterious material on electrical equipment associated with starting of the diesel generators (e.g., auxiliary relay contacts, control switches, etc.). Describe the provisions that have been made in your diesel generator building design, electrical starting system, and combustion air and ventilation air intake design(s) to preclude this condition to assure availability of the diesel generator on demand.

Also describe under normal plant operation what procedure(s) will be used to minimize accumulation of dust in the diesel generator room; specifically address concrete dust control (SRP 9.5.8, Parts II and III).

Response:

NEMA Type 12 enclosures are used for all diesel generator electrical panels and are designed to protect the enclosed equipment against dirt and dust.

ADD THIS

The current in-place station administrative procedures require that a housekeeping program exist to ensure that the quality of safety-related items is not degraded as a result of housekeeping practices. A senior supervisor, along with other plant supervisory personnel, the station housekeeping committee, and employees, are responsible to ensure housekeeping requirements are properly implemented. This program is in accordance with Regulatory Guide 1.39.

To minimize the entry of airborne particulate material from the outside, the bottoms of the ventilation air intakes for the diesel generator rooms are located 27 feet above grade elevation (paragraph III.4 of SRP 9.4.5 specifies a minimum of 20 feet for this distance).

Concrete is proportioned, placed, and cured such that the existence of loose concrete dust on formed and floor surfaces is prevented. Personnel foot traffic into the diesel generator building is expected to introduce small amounts of mud, dirt and dust originating from other areas, principally the yard area. This debris, in conjunction with normal foot traffic, will act as an abrasive, thus loosening a small quantity of additional dust from concrete floor surfaces. The total dust produced, however, will be adequately addressed by the housekeeping program and other measures described herein.

Finally, NEMA Type 12 enclosures are used for all diesel generator electrical panels and are designed to protect the enclosed equipment against dirt and dust.

NRC Letter: September 19, 1983

Question 430.126 (Section 9.5.8)

Figure 1.2-2 of the FSAR shows system station service transformer 2A located near the diesel generator building . A transformer fire with the right meteorological conditions could degrade engine operation by the products of combustion being drawn into the D/G ventilation system and D/G combustion air intake system. The same conditions apply for the oil storage laydown area and oil separator no. 22, located in the immediate area of the diesel generator building. Discuss the provisions of your design (site characteristics, ventilation system and building design, etc) which preclude this event from occurring (SRP 9.5.8, Parts II and III).

Response:

Provisions in BVPS-2 design which preclude degradation of diesel performance because of combustion product intake include:

1. A heat detector-actuated, automatic water spray deluge system and backup fire suppression capability provided by a yard fire hydrant for system station service transformer 2A.

2. The oil storage laydown area is used only to hold the oil drained from station service transformer 2A during maintenance. This type of maintenance can only be done during a plant shutdown condition.

3. Oil separator No. 22 is buried and its vent is supplied with a flame arrestor. ANY OVERFLOW FROM THE OIL SEPARATOR GOES TO THE STORM SEWER SYSTEM WHERE IT WOULD NOT CONSTITUTE A FIRE HAZARD.

1. The ~~Station Service Transformers~~ SYSTEM station service transformers are used to bring offsite power into the plant and would not be transmitting power during normal ~~plant conditions~~ POWER OPERATION. In the unlikely event of a fire in SYSTEM station service transformer 2A, plant auxiliary power could be supplied by either the main generator or offsite power via the redundant SYSTEM station service transformer 2B (located on the northwest side of the plant). DURING NORMAL POWER OPERATION, LOSS OF STATION SERVICE TRANSFORMER 2A WOULD NOT RESULT IN A DIESEL START SIGNAL. In addition, a heat detector-actuated, automatic water spray deluge system and backup fire suppression capability from a yard fire hydrant are provided for SYSTEM station service transformer 2A.

GDC 5

Question (Provided Informally):

The information submitted by the applicant in Amendment 4 to the FSAR indicates that the communication systems, in particular the page party system, the radio system, the microwave system, and telephone systems, are shared, interconnected in some manner, or can be connected to their counterpart systems in Beaver Valley Unit 1. From the information submitted, the staff cannot determine if the communication systems are designed to meet the requirements of GDC 5.

Response:

As clearly stated in the standard review plan, there are no general design criteria which apply to communications systems. Therefore, GDC 5 was not considered as a design basis for BVPS communications systems. Regardless of the review criteria being applied here, experience in designing communications systems has resulted in certain independence of communications systems between BVPS-1 and BVPS-2 where it makes engineering sense to do so. The following discussions attempt to answer the reviewer's concern.

The page party systems for BVPS-1 and BVPS-2 normally operate as two independent systems. The handsets and speakers for each system are located only in areas of their respective unit so that messages pertaining to one unit will not be monitored on the other unit. The page party systems of the two units can be combined if desired. This is accomplished by use of "merge-isolate" switches located at the communications panel in the main control room, at the auxiliary shutdown panel of BVPS-1, and at the alternate shutdown panel of BVPS-2. These switches are normally in the "isolate" position, which allows for independent operation of each unit's system. The "merge-isolate" switches are provided for the purpose of making emergency announcements at both units simultaneously and are returned to the "isolate" mode following use. This will maximize the number of channels available at each unit and will not interfere with plant shutdown.

The radio system consists of several separate elements. Base stations and hand-held units communicate through either of two selected radios (VHF high band and VHF low band) located in the Radio Building. In addition, the control room is provided with a third radio (VHF high band) and a roof mounted antenna should the others be inoperative. These multible radio systems assure that loss of all radio communications is unlikely.

The private automatic exchange (PAX) telephone system is shared between the two units. The telephone lines from the switchboard to various parts of the two units are fed radially and are in separate conduits. This modular construction assures that the loss of a local line does not cause the loss of the entire system or affect other incoming or outgoing calls.

The microwave system is no longer used for voice communications at BVPS and was never intended to be used for onsite communications. A revised response to Question 430.58 will address deletion of this system.

Based upon the diversity of communications systems provided for BVPS and the design features of each system described above, it can be concluded that failure of a communications system at one plant cannot affect safety at the other.