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Robert L. Mittl General Manager
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June 20, 1984

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Bethesda, Maryland 20814

Attention: Mr. Albert Schwencer, Chief
Licensing Branch 2
Division of Licensing

Gentlemen:

HOPE CREEK GENERATING STATION
DOCKET NO. 50-354
FSAR COMMITMENT STATUS THROUGH MAY 1984

Public Service Electric and Gas Company presently does not plan to issue Amendment No. 6 to the Hope Creek Generating Station Final Safety Analysis Report before July 1984. Accordingly, this letter is provided to document the status of Hope Creek Generating Station responses to NRC requests for additional information which were forecasted to be responded to by May 1984.

Attachment I is a tabulation of the Hope Creek Generating Station Final Safety Analysis Report commitments for May 1984, and the corresponding resolution for each commitment. Attachments II through XI provide the responses to the questions forecasted to be responded to in May 1984, which will be included in Amendment No. 6.

Should you have any questions in this regard, please contact us.

Very truly yours,

R L Mittl



B001 1/1

Attachment I - Hope Creek Generating Station - FSAR Commitment Status through May 1984

Attachment II - Response to Question 430.22
Attachment III - Response to Question 430.83
Attachment IV - Response to Question 430.108
Attachment V - Response to Question 430.109
Attachment VI - Response to Question 430.131
Attachment VII - Response to Question 430.135
Attachment VIII - Response to Question 430.136
Attachment IX - Response to Question 430.138
Attachment X - Response to Question 430.145
Attachment XI - Response to Question 460.3

C D. H. Wagner (w/attach)
USNRC Licensing Project Manager

W. H. Bateman (w/attach)
USNRC Senior Resident Inspector

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ATTACHMENT I
HOPE CREEK GENERATING STATION
FSAR COMMITMENT STATUS THROUGH MAY 1984

| | FSAR Commitment Location | Commitment Resolution |
|---|---|---|
| 1. | Question/Response Appendix: Question 421.13 | This commitment concerns testing in accordance with IEEE-Std. 472-1974 to ensure adequate protection for isolation system for ERFDAS. This information will be provided in July 1984. |
| 2. | Question/Response Appendix: Question 430.22 | This commitment concerns providing results of DG lead acceptance test. The response to this question is provided in Attachment II and will be included in Amendment 6 to the HCGS FSAR. |
| 3. | Question/Response Appendix: Question 430.81 | This commitment concerns the use of Carboline Carbo Zinc II in Diesel Fuel Oil Storage Tank. This information will be provided in July 1984. |
| 4. | Question/Response Appendix: Question 430.83 | This commitment concerns the Seismic Category of DG. The response to this question is provided in Attachment III and will be included in Amendment 6 to the HCGS FSAR. |
| 5. | Question/Response Appendix: Question 430.108 | This commitment concerns tube leaks in DG Jacket Cooling Heat Exchanger. The response to this question is provided in Attachment IV and will be included in Amendment 6 to the HCGS FSAR. |

| FSAR Commitment Location | Commitment Resolution |
|---|---|
| 6. Question/Response Appendix: Question 430.109 | This commitment concerns the DG heat removal capacity. The response to this question is provided in Attachment V and will be included in Amendment 6 to the HCGS FSAR. |
| 7. Question/Response Appendix: Question 430.131 | This commitment concerns the DG lube oil system. The response to this question is provided in Attachment VI and will be included in Amendment 6 to the HCGS FSAR. |
| 8. Question/Response Appendix: Question 430.135 | This commitment concerns entry of deleterious materials into DG lube oil system. The response to this question is provided in Attachment VII and will be included in Amendment 6 to the HCGS FSAR. |
| 9. Question/Response Appendix: Question 430.136 | This commitment concerns DG lube oil cooling. The response to this question is provided in Attachment VIII and will be included in Amendment 6 to the HCGS FSAR. |
| 10. Question/Response Appendix: Question 430.138 | This commitment concerns DG lube oil level alarm. The response to this question is provided in Attachment IX and will be included in Amendment 6 of the HCGS FSAR. |
| 11. Question/Response Appendix: Question 430.145 | This commitment concerns environmental service conditions for DG. The response to this question is provided in Attachment X and will be included in Amendment 6 to the HCGS FSAR. |

| FSAR Commitment Location | Commitment Resolution |
|---|---|
| 12. Question/Response Appendix: Question 440.21 | This commitment concerns adding drain lines to FSAR Figure 5.4-13. This information will be provided in July 1984. |
| 13. Question/Response Appendix: Question 460.3 | This commitment concerns providing outstanding information in FSAR Table 11.5-1. The response to this question is provided in Attachment XI and will be included in Amendment 6 to the HCGS FSAR. |
| 14. Supplementary Request for Additional Information (1) C.12 | This commitment concerns TMI Item II.K.3.16. This information will be provided in July 1984. |

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IB 31 3/5

QUESTION 430.22 (SECTION 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 demonstrates 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.

BLP 15723
PLB 6908

RESPONSE

See reponse to Question 430.111 and 430.145 for the information requested above.

QUESTION 430.83 (SECTION 3.2)

The FSAR text and Table 3.2-1 indicates that the components and piping systems for the diesel generator auxiliaries (fuel oil system, cooling water, lubrication, air starting, and intake and combustion system) that are mounted on the auxiliary skids are designed seismic Category I and are ASME Section III, Class 3. The engine mounted components and piping and certain other components listed in the various Sections of 9.5 and Table 3.2-1 are designed and manufactured to DEMA standards and/or manufacturer's standards and are seismic Category I. This is not in accordance with Regulatory Guide 1.26 which requires the entire diesel generator auxiliary systems be designed to ASME Section III Class 3 or Quality Group C. You also state that the figures in Section 9.5 show where quality group classification changes are. The figures do not provide this information. Provide the following: (a) the industry standards that were used in the design, manufacture, and inspection of the engine mounted piping and components, (b) show on the appropriate P&ID's where the Quality Group Classification changes from Quality Group C, and where the Seismic Category I portions of the system are located. Sections 9.5.4 through 9.5.8 and Table 3.2-1 define certain pumps, filters, strainers, valves, and subsystems in the diesel generator auxiliary systems as Quality Group D or not applicable with regards to Quality Group Classification. It is our position that all components and piping in the diesel generator auxiliary systems be designed to Seismic Category I ASME Section III Class 3 requirements. Comply with this position or justify noncompliance. (SRPs 9.5.4 - 9.5.8, Part III)

BLP15723
PLB 6816

RESPONSE

a. The engine mounted piping systems (such as the lube oil headers, water headers, cylinder heads, etc) are manufactured to the manufacturer's proprietary design requirements which do not necessarily meet the requirements of ASME Section III or ANSI B.31. The components used are pressure tested and the manufacturing processes are monitored as part of the supplier's approved QA program. The major components are included in the seismic analysis.

   (It should be noted that the DEMA standard is not a design specification, but gives guidance as to what should be included in a performance type specification.)

b. The figure in Section 9.5 can be used to determine quality group classification and seismic boundaries. The diesel engine auxiliary system P&IDs (Figures 9.5-22, 25, and 28) indicate the piping line classes and the piping specification changes as defined on Figure 1.13-1, sheet 1 (P&ID legend). The third letter of the three-letter piping

BLP 15723
PLB 6816

line class code indicates the code to which the piping and components are built. Tables 3.2-2 and 3.2-3 can then be used to determine the quality group classification based on the applicable code. The Seismic Category I boundaries are indicated by the Q-flags as indicated in Section 3.2.1.

Section 1.8.1.26 has been revised to include a clarification of Regulatory Guide 1.26, Revision 3, Position C.2.b with regard to engine-mounted components and piping.

The following concerns will be addressed by July, 1984:

a. The EDG air start system is a high energy system. All portions of the system which are high energy during standby and operations need to be ASME III, Class 3.b.

b. Verify or analyze that a pipe break in the air start system does not damage any other piping on the engine (of equal or less diameter).

c. Analysis or justification for parts that are not ASME is required.

d. Engine mounted piping generally meets the requirements of ANSI B31.1.

e. Verify compliance or indicate why equivalent.

QUESTION 430.108 (SECTION 9.5.5)

Recent licensee event reports have shown that tube leaks are being experienced in the heat exchangers of diesel engine jacket cooling water systems with resultant engine failure to start on demand. Provide a discussion of the means used to detect tube leakage and the corrective measures that will be taken. Include jacket water leakage into the lube oil system (standby mode), lube oil leakage into the jacket water (operating mode), jacket water leakage into the engine air intake and governor system (operating or standby mode). Provide the permissable inleakage or outleakage in each of the above conditions which can be tolerated without degrading engine performance or causing engine failure. The discussion should also include the effects of jacjet water/service water systems leakage. (SRP 9.5.5, Parts II & III)

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RESPONSE

The heat exchangers are procured to ASME Section III design and quality requirements, and are seismically qualified.

Leaks at tubes in heat exchange equipment are very difficult to discern by any means short of removing the heat exchanger from the system and subjecting it to hydrostatic testing. Instruments to determine lube oil in water or water in lube oil are generally not reliable. Monitoring of the lube oil level or the cooling water level is not reliable in all cases in as much as there are so many influences other than the heat exchange equipment.

The cooling water systems will be analyzed regularly in accordance with plant operating procedures.

Generally, lube oil in the water system has no detrimental effect on the engine. However, water in the lube oil is of concern. High enough concentrations can definitely affect lubrication and lead to premature component failure. The diesel engine lube oil will be monitored and analyzed in accordance with lube oil suppliers recommendations and diesel manufacturers operation and maintenance procedures. A discussion of water contamination of lube oil is included in response to Question 430.125.

The rocker arm lubrication system is separated from the main lubrication system because of the proximity of the rocker system to sources of water (cylinder heads, rocker assemblies, etc). Addition of water to that system, due to leakage, would be detected by the high rocker arm tank level alarm.

The following concerns will be addressed by July, 1984:

a. Define "regularly" and "high concentrations".

b. Address leakages for the intercooler and governor.

c. Specify what leak rates can be tolerated.

QUESTION 430.109 (SECTION 9.5.5)

Proper operation of the standby diesel generator during accident and transient conditions requires that heat removal capability is restored before the diesel engine exceeds its operating design temperature limits. In Figure 9.5-23 of the FSAR you show a control valve on the standby diesel generator intercooler and injector cooling system heat exchanger, but you do not state in the FSAR the time period between engine start and valve opening. Provide the following:

a. The time interval between the diesel engine start and the opening of service water inlet valve or service water pump restart (assuming loss of offsite power) whichever is longer.

b. Results of an analysis which shows that cooling will be restored to the diesel engine before it overheats. (SRP 9.5.5, Part II and III)

RESPONSE

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The referenced valve is an air operated butterfly valve (shown on Figure 9.2-5) which opens within 9 seconds after starting of the diesel generator. The actual location of this valve is downstream of the lube oil heat exchanger. Figures 9.2-23 and 9.2-27 have been revised to depict the actual location of this valve.

As explained in Section 9.2.2, the cooling to the diesel generator coolers (e.g., combustion air cooler, jacket water cooler and lube oil cooler) is provided by an intermediate cooling water system; safety auxiliaries cooling system (SACS) which in turn is cooled by the station service water system (SSWS) (Section 9.2.1). As described in Table 8.3-1 the SACS pumps and SSWS pumps start 45 and 55 seconds, respectively, after starting of the diesel engine. The heat sink available within the jacket water and lube oil circulating systems, and in the intercooler water circuit, is such that the unit could be operated for a period of up to 3 minutes at rated output before the engine would be in any danger of setting off system high temperature alarms or doing any damage to the equipment. Therefore the 45 to 55 second time interval is sufficient to establish adequate cooling water flow to the diesel engines before high temperature limits are exceeded.

<u>QUESTION 430.131</u> (SECTION 9.5.7)

You state in Section 9.5.7 of the FSAR that the lube oil used to lubricate the engine is stored in a lube oil sump tank and a 250 gallon make-up lube oil tank. During diesel engine operation a certain amount of lube oil is consumed as part of the combustion process. Since the diesel generator may be required to operate for a minimum seven days during a loss of offsite power or accident condition, sufficient lube oil should be stored in the sump and/or site to preclude diesel generator unavailability due to lack of lube oil. You state that the sump and its make-up tank contains an adequate supply of lube oil for the diesel generator to operate for a minimum of 7 days at maximum rated load. Provide the following:

a. Provide the normal lube oil usage rate for each diesel engine under full load conditions. Also provide the lube oil usage rates which would be considered excessive.

b. Show with the lube oil in the sump and the make-up tank at the minimum recommended level (low level alarm settings) that the diesel engine can operate wityout refilling the lube oil sump and make-up tank for a minimum of seven days at maximum rated load. If the sump and make-up tank capacity is insufficient for this condition, show that adequate lube oil will be stored onsite for each engine to assure seven days of operation at rated load.

c. Show with the lube oil in the sump at the minimum recommended level (low level alarm setting) and assuming a failure (in the closed position) of the solenoid operated valve between the make-up tank and the sump, that the diesel engine can operate without refilling the lube oil sump for a minimum of seven days at maximum rated load. If the sump capacity is insufficient for this condition, show that adequate lube oil will be stored on site for each engine to assure seven days of operation at rated load. Discuss operator action on failure of the solenoid valve to assure continued engine operation and how fuel would be added to the engine sump under this condition.

d. If the lube oil consumption rate becomes excessive, discuss the provisions for determining when to overhaul the engine. The discussion should include the procedures used and the quality of operator training provided to enable determination of excessive L.O. consumption rate. (Refer to requests 430.62.3 and 430.61 for additional requirements on procedures and training). (SRP 9.5.7, Parts II & III)

BLP15723
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RESPONSE

a. The lube oil consumption rate for the standby diesel generator at the rated 4430 KW (6186 BHP) is 1.12 to 1.55 gallons per hour. The engine manufacturer, Colt Industries, indicates that the lube oil consumption rate does not vary appreciably with the engine load level.

The engine manufacturer indicates that a lube oil consumption rate of 3 gallons per hour would be considered excessive and should be investigated and remedied.

b. The diesel engine manufacturer recommends that the diesel engine sump be kept "topped off" in the standby condition and not allowed to be at the "minimum level" condition so that it is always ready to operate for the maximum duration required.

To raise the lube oil level in the diesel engine sump from the minimum level to the full running depth, approximatly 220 gallons of lube oil is required, which is the capacity of four 55 gallon storage drums of oil. At a consumption rate of 1.55 gallons per hour the engine can operate for 142 hours. To operate for 168 hours, an average consumption rate of 1.31 gallons per hour should not be exceeded, which is in the expected consumption range. The lube oil make up tank contains 250 gallons of oil, therefore, the make up tank can raise the sump level from minimum level to full with an additional 30 gallon in reserve. The lube oil make up tank can therefore maintain the diesel engine in the operating lube oil range for 161 hours at a consumption rate of 1.55 gallons per hour.

On site lube oil storage, for the diesel generators, will consist of twenty 55 gallon drums, which will be sufficient to maintain the diesel engines lube oil sump in the operating range for 7 days at rated power.

c. Operator action on failure of the solenoid valve to provide adequate engine lube oil sump makeup capability will be specified in the appropriate alarm response procedure. This procedure shall also provide direction to the operator as to the alternate methods of adding lube oil to the engine sump. The preferred method of alternate engine sump lube oil addition is currently being evaluated through discussions between PSE&G and the engine manufacturer. Further details will be provided by July 1984. Refer to response (b) above for

BLP15723
PLB684

lube oil on site storage and vendor recommended standby lube oil levels.

d. If during the course of routine SDG operation, it becomes apparent that the lube oil consumption rate is excessive, engineering and vendor services will be drawn-on to assist in identifying and correcting the abnormal condition.

Operating department shift reading sheets will require the visual verification and logging of the SDG lube oil make-up tank levels on a daily basis when the SDG is in "standby" condition. Additionally, SDG periodic test procedures will require the visual verification of lube oil make-up tank level(s), both before and after such testing is performed. Upon completion of testing, the findings will be compared against the previous months test results and the normal oil usage rates (as defined in responst to item "a"). In this manner, any appreciable changes in engine performance will be immediately identified and corrective measures taken as necessary.

Plant operator training, and subsequent requalification training, adequately stress the importance of proper equipment lubrication, logkeeping and systems training. This training, combined with "in-house" plant experience, suffices to alert operators to any abnormal diesel generator condition.

BLP1572
PLB 684

In addition, the following concerns will be addressed by July, 1984:

a. Assure that a 7 day supply of lube oil is available assuming the initial level is at the low level alarm and the maximum consumption rate, or

b. Assurance that there is a 7 day supply of lube oil on site if the diesel engine does not have sufficient lube oil to operate for 7 days at the maximum consumption rate, at the low level alarm.

c. Assurance that the lube oil sump can be filled assuming a failure of the solenoid operated makeup valve and no makeup tank available.

QUESTION 430.135 (SECTION 9.5.7)

You state in Section 9.5.7.2 of the FSAR and shown in Figure 9.5-27 that lube oil is added to the diesel generator lubricating oil system from a 250 gallon lube oil make-up tank. Provide a discussion on the measures that have been taken to prevent entry of deleterious materials in the lube oil make-up tank. Also discuss what measures have been taken to prevent entry of deleterious materials into the lube oil make-up tank due to operator error during filling operation.

In addition address the following:

a. Discuss the means for detecting or preventing growth of algae in the lube oil make-up tank. If it were detected, describe the methods to be provided for cleaning the affected storage tank.

b. Provide an explicit description of proposed corrosion protection for the lube oil make-up tank. Where corrosion protective coatings are being considered for the piping and tanks (both external and internal) include the industry standards which will be used in their application.

c. Figure 9.5-27 of the FSAR shows that the diesel generator lube oil make-up tank is provided with an individual fill, vent, and emergency pressure relief vent lines. Indicate where these lines are located (indoor or outdoor) and the height these lines are terminated above finished ground grade. If these lines are located outdoors discuss the provisions made in your design to prevent entrance of water into the make-up tank during adverse environmental conditions, and the tornado missile protection provided.

d. Assume an unlikely event has occurred requiring operation of a diesel generator for a prolonged period that would require replenishment of lube oil in the sump without interruping operation of the diesel generator. What provisions have been made in the lube oil transfer system design from the lube oil make-up tank to the engine sump to prevent carryover of sediment, water, and scale that may accumulate in the clean lube oil storage tank. What provisions have been made for the removal of accumulated sediment, water, and other deleterious material that may collect at the bottom of the storage tank. (SRP 9.5.7, Parts II & III)

BLP 1572; PLB 684;

RESPONSE

a. The 250 gallon lube oil make-up tank is provided with inspection ports, one upper and one lower. If algae growth is detected in the lube oil make up tanks a lube oil addative can be added to eliminate the algae and to prevent further growth.

Inspections of the lube oil makeup tanks will be performed during each refueling outage.

b. The standby diesel generator lube oil make up tank material is carbon steel, SA 515 GR. 70. The exterior of the tank is coated using Colt Industries standard protection system. The system consists of a primer of Gordon Bartells 13409, yellow, and a finish coat of Gordon Bartells 14-811, suede grey, both applied according to the paint manufactures recommendations. The interior of the tank is not coated because the lube oil is non-corrosive and the tank is expected to be maintained in the full condition.

c. The vent and emergency pressure relief vent are terminated indoors, directly above the tank. The fill line is routed to the outside (west) of the auxiliary building at elevation 105 feet 0 inches, 3 feet above grade. The line is capped and has a normally closed isolation valve located in the building to prevent water from entering the line. It is not protected from missiles and tornadoes because it is not safety-related.

d. The lube oil makeup tank bottom is hemispherical. The line to the diesel generator sump is approximately 1.75 inches above the bottom of the dish. Should there be any carry over into the transfer line, it would be trapped in the strainer and/or filter before entering the engine sump.

A normally closed drain valve is provided at the low point of the tank, reference Figure 9.5-27. The drain valve will be opened in accordance with plant operating procedures deleterious to remove any sediment, water or other material that may accumulate in the bottom of the tank.

The following concerns will be addressed by July, 1984:

a. Description of corrosion protection

b. Effects of sedimentation

BLP1572
PLB684

c. Algae detection and control in the lube oil makeup tank.

QUESTION 430.136 (SECTION 7.5.5, 9.5.7)

You state in the FSAR that cooling to the diesel engine cooling water systems and the lube oil system is provided by the Safety Auxiliaries Cooling System (SACS). Figures 9.5-23, 95.-24 and 9.5-27 of the FSAR show the intercooler heater exchanger, the jacket water heat exchanger and the lube oil heat exchanger connected in series with the SACS providing cooling to the intercooler heater exchanger first and the lube oil heat exchanger last. Other plants with the same type of engine design have the lube oil heat exchanger cooled by the diesel engine jacket water system. Rather than cooled by a service water system or have a separate independing connection to the service water cooling system. Justify that your design of having the lube oil heat exchanger in series with the cooling water heat exchangers, will adequately cool and maintain lube oil temperature within manufacturer's specifications during engine operation. (SRP 9.5.7, Part I, II, and III)

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RESPONSE

It is the manufacturer's design to have the intercooler heat exchanger, the jacket water heat exchanger, and the lube oil heat exchanger cooled by the series arrangement shown in the referred drawings. We are committed to supply inlet cooling water to these diesel generator coolers in accordance with the manufacturer's requirements. These requirements are shown in Table 9.2-4.

Colt confirms that 95°F inlet temperature of cooling water is adequate for proper cooling of this unit. The series system as outlined (intercooler heat exchanger, jacket water heat exchanger, and finally, lube oil heat exchanger) is the manufacturer's proven standard design.

The following concerns will be addressed by July, 1984:

a. Conformation that with an initial temperature of 95°F, plus the incremental temperature increases across each of the succeeding heat exchangers, the inlet temperature to each succeeding heat exchanger is adequate.

BLP 1572
PLB 684

QUESTION 430.138 (SECTION 9.5.7)

In Sections 9.5.7.3 and 9.5.7.5 of the FSAR you discuss the level alarms associated with the lube oil system. You state that "the rocker arm lube oil reservoir level is monitored for high level and the level is maintained by a level control valve." No mention is made of a reservoir low level alarm. A failure of the level control valve to maintain lube oil level in the rocker arm reservoir could result in inadequate or no lubricating oil for the rocker arms, leading to diesel generator unavailability and/or failure. This is an unacceptable condition. Provide a low level alarm for the rocker arm lube oil reservoir. (SRP 9.5.7, Part III)

RESPONSE

The rocker arm lubrication system is also monitored by a rocker arm lube oil pressure low switch (KPLA), which would initiate an alarm in the event that insufficient pressure is available in the rocker arm lube oil system due to any of the following causes:

a. the filters are plugged,

b. the system has run low on oil level due to malfunction of the automatic level fill valve,

c. the engine driven pump (or its drive) has failed.

Upon the alarm, the motor driven rocker arm lube oil pump is also started. If the problem was caused by a or b, the operator must take appropriate action.

The function of the high level alarm switch is to alert personnel that:

a. Fluids other than oil, such as a fuel oil leak at an injector, or a water leak in the cylinder head (between the jacket water system and rocker arm lube oil drain system) have entered the rocker arm lube oil system.

b. The lube oil supply valve (float valve) has malfunctioned (open).

In either case, the operator must investigate and remedy the problem.

Therefore a low level alarm for the rocker arm lube oil reservoir is not required.

The following concerns will be addressed by July, 1984:

a. Identify "appropriate" operator actions.

BLP15772
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b. Provide the time the engine can operate after a low pressure alarm.

QUESTION 430.145 (SECTION 8.3.1, 9.5.6)

Diesel generators for nuclear power plants should be capable of operating at maximum rated output under various service conditions. Under no load and light load operations, the diesel generator may not be capable of operating for extended periods of time under extreme service conditions or weather disturbances without serious degradation of the engine performance. This could result in the inability of the diesel engine to accept full load or fail to perform on demand. Provide the following:

a. The environmental service conditions for which your diesel generator is designed to deliver rated load including the following:

   Service Conditions

   (a) ambient air intake temperature range-°F

   (b) humidity, max-%

b. Assurance that the diesel generator can provide full rated load under the following weather disturbances:

   (1) A tornado pressure transient causing an atmospheric pressure reduction of 3 psi in 1.5 seconds followed by a rise to normal pressure in 1.5 seconds.

   (2) A low pressure storm such as a hurricane resulting in ambient pressure of not less than 26 inches Hg for a minimum duration of two (2) hours followed by a pressure of no less than 26 to 27 inches Hg for an extended period of time (approximately 12 hours).

c. In light of recent weather conditions (subzero temperatures), discuss the effects low ambient temperature will have on engine standby and operation and effect on its output particularly at no load and light load operation. Will air preheating be required to maintain engine performance? Provide curve or table which shows, performance verses ambient temperature for your diesel generator at normal rated load, light load, and no load conditions. Also provide assurance that the engine jacket water and lube oil preheat systems has the capacity to maintain the diesel engine at manufacturer's recommended standby temperatures with minimum expected ambient conditions. If the engine jacket water and lube oil preheat systems' capacity is not sufficient to do the above, discuss how this

equipment will be maintained at ready stand-by status with minimum ambient temperature.

d. Provide the manufacturer's design data for ambient pressure vs engine derating.

e. Discuss the effects of any other service and weather conditions will have on engine operation and output, i.e., dust storm, air restruction, etc. (SRP 8.3.1, Parts II & III; SRP 9.5.5, Part III, SRP 9.5.7, Parts II & III; and SRP 9.5.8, Parts II & III)

BLP15723
PLB 6816

RESPONSE

a. The environmental service conditions are:

(a) Ambient air intake range: outdoor

| | | | |
|---|---|---|---|
| winter | -4°F | RH | 25 to 95% |
| summer | +102°F | RH | 25 to 95% |

(b) The diesel engine is not sensitive to humidity. The unit will tolerate, with no effect on load capability or rating, any relative humidity from 0 to 100%.

b. 1&2, & c. Engine Rating/Capability During Adverse Weather Conditions

Engines are rated on a basis of the long term effects on the life of the engine due to altitude, ambient temperatures, and so forth. Hurricanes and tornadoes are considered short term conditions and are of no consequence to the rating or capability of these units.

The diesels are designed to operate over the full range of operating loads under the environmental conditions described in part a.(a) & (b).

d. A curve of the 12CR.PC2 class engine derating for ambient pressure (altitude) is attached (Figure 430.145-1). It should be noted that this curve is applicable on the long term basis - altitude derating - and is not applicable to short term phenomena such as tornadoes, hurricanes, tropical storms, or other weather depresssions.

e. The diesel engine manufacturer confirms that as long as the unit is adequately maintained (air intake filters kept cleaned, etc), there are no other conditions adverse to the engine.

BLP1572
PLB6816

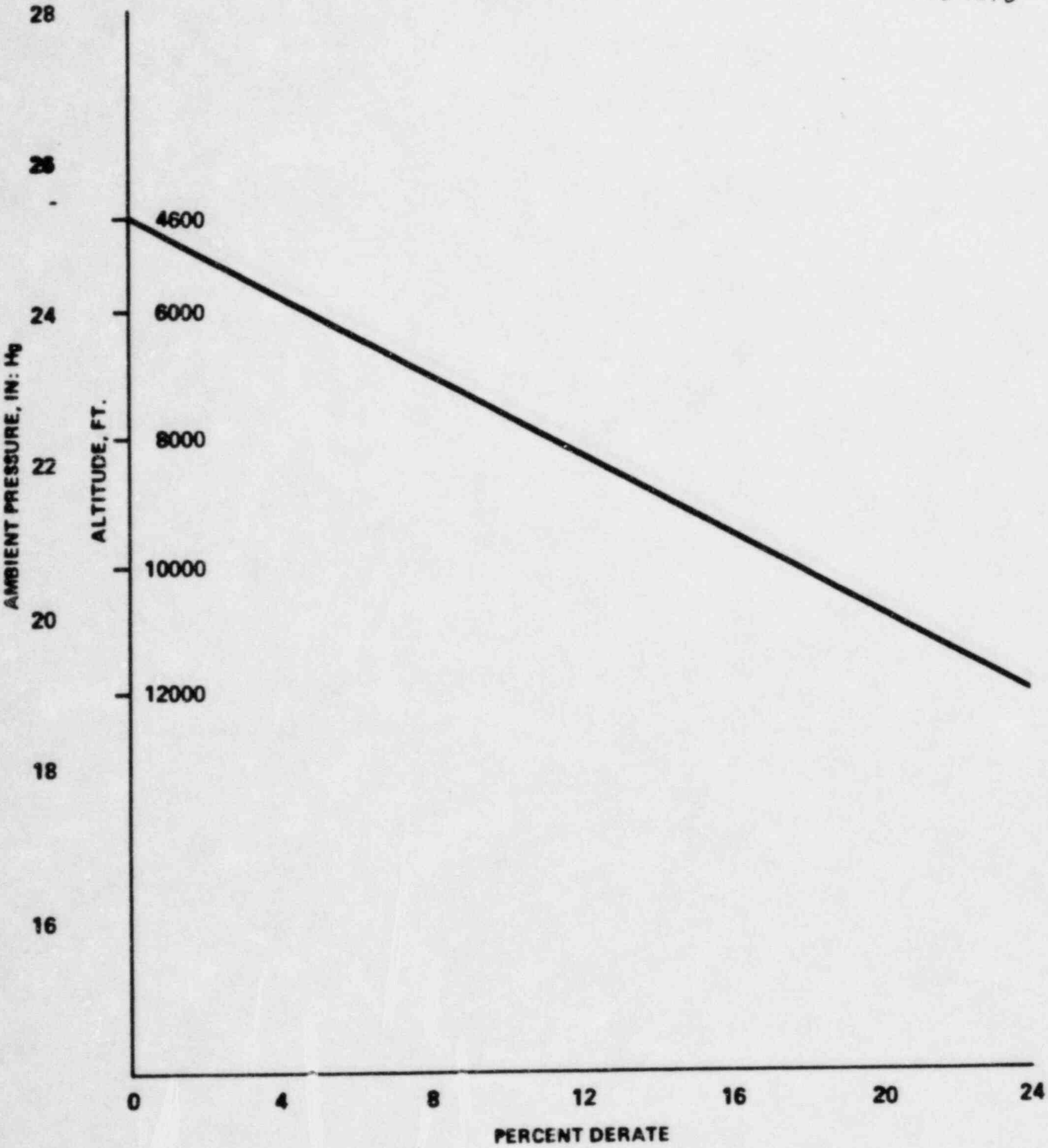
The following concerns will be addressed by July, 1984:

a. Confirmation from Colt that low temperature operation at no load has no effect on EDG availability.

b. Determine if the circumstances referred to in Question 430.145, (failure of the EDG HVAC, with a loss of heaters to the HVAC system) with no preheat will endanger operation.

c. Determine if the existing preheat for the lube oil and jacket water system is adequate with the failure of the HVAC system.

BCP15723
PLB 6816




HOPE CREEK
GENERATING STATION
FINAL SAFETY ANALYSIS REPORT

12 CYL. PC2 (4238KW AT 514 RPM)
AMBIENT PRESSURE VS.
PERCENT DERATE

FIGURE 430.145-1 AMENDMENT 6, 06/84

QUESTION 460.3 (SECTION 11.5)

Table 11.5-1 indicates some information will be supplied later. Either provide this information or a schedule for its submittal.

RESPONSE

All of the "laters" on Table 11.5-1 were provided in Amendment 2 (10/83).

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