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Dalwyn R. Davidson
VICE PRESIDENT
SYSTEM ENGINEERING AND CONSTRUCTION

April 29, 1982

Mr. A. Schwencer
Chief, Licensing Branch No. 2
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Response to Draft SER
Power Systems Branch

Dear Mr. Schwencer:

This letter and its attachment is submitted to provide revised responses to the concerns identified in the Draft SER for Power Systems.

It is our intention to incorporate these responses in a subsequent amendment to our Final Safety Analysis Report.

Very Truly Yours,

Dalwyn R. Davidson

Dalwyn R. Davidson
Vice President
System Engineering and Construction

DRD: mlb

cc: Jay Silberg
John Stefano
Max Gildner

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430.17 The FSAR text and Table 3.2-1 states that the components and piping
(3.2) systems for the diesel generator auxiliaries (fuel oil system,
(9.5.4) cooling water, lubrication, air starting, and intake and combustion
(9.5.5) system) that are mounted on the auxiliary skids are designed Seismic
(9.5.6) Category I and are ASME Section III Class 3 quality. The engine
(9.5.7) mounted components and piping are designed and manufactured to
(9.5.8) DEMA 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. Provide the industry standards that were used in the design, manufacture, and inspection of the engine mounted piping and components. Also show on the appropriate P&ID's where the Quality Group Classification changes from Quality Group C.

Response

Compliance with current regulations is reflected in revised Sections 9.5.4.3, 9.5.5.3, 9.5.6.3, 9.5.7.3, 9.5.8.1, and 9.5.9.3.

The industry standards applicable to the design, manufacture and inspection of the HPCS diesel generator are given in — . of NEDO 10905.

The P&ID's indicate the safety classification changes from Safety Class 3 (Quality Group C) to non-safety class. Refer to Figures 9.5-8, 9.5-9, 9.5-10, 9.5-11, and 9.5-12.

The design of the standby diesel generator engine mounted auxiliary system piping components and the HPCS diesel generator auxiliary systems piping and components, both engine mounted and auxiliary skid-mounted can be demonstrated equivalent to systems designed to ASME Section III Class 3 requirements with regard to system functional operability and inservice reliability.

This piping and components as part of the diesel engine package are seismically qualified to Category I requirements which provides assurance of operability for a design basis seismic event. The diesel engines are manufactured, and tested, and inspected in accordance with the quality

assurance program requirements of ANSI 45.2 "Quality Assurance Program Requirements for Nuclear Facilities". Qualification and periodic testing in accordance with the guidelines of Regulatory Guides 1.9, "Selection, Design, and Qualification of Diesel-Generator Units used as Standby(Onsite) Electric Power Systems at Nuclear Power Plants", and 1.108, "Periodic Testing of Diesel Generator Units used as Onsite Electric Power Systems at Nuclear Power Plants" provides further assurance of inservice reliability.

Additionally, an analysis of system stresses has been performed to show that the piping and associated components are designed with sufficient margin for the system application and working stresses are within the limits of ANSI Standard B31.a, "Code for Pressure Piping." The analysis considered the worst case combination of pipe material, largest diameter, minimum wall thickness, maximum system pressures and temperatures and piping support spacing for all the auxiliary systems. The analysis showed that under normal operating conditions stresses due to pressure,dead weight, and thermal loads are less than ten percent of the allowable stresses per ANSI Standard B31.1. Thus, the piping is intentionally overdesigned for these low working stresses and results in a high degree of assurance of system functional operability.

430.34 (9.5.5) Figure 9-5-16 shows an immersion heater in the diesel engine cooling water system attached directly to the lube oil cooler, and to the engine-driven pumps' suction and discharge lines. The FSAR in Section 9.5.9 does not provide a detailed description of how the diesel engine cooling water system operates during standby conditions nor does the design of this system seem to provide for preheating of the jacket water to enhance engine start capability. Provide a detailed description of how the diesel engine cooling water system operates on standby conditions.

Response

A detailed description of the diesel engine cooling water system operation on standby conditions is provided in revised Section 9.5.9.2.2.

The HPCS diesel engine specificiation requires the engine to operate at room temperatures ranging from 40° to 120°F. The diesel generator building HVAC systems are designed to maintain the required environmental conditions between the minimum and maximum ambient conditions specified. The design basis thus provides an ambient room temperature ranging from 40° to 120°F for outside temperature ranging from -5° dry bulb to 95°F. Engine low temperature condition will be annunciated in the control room through a low temperature alarm(85°F) in the lube oil return line to the strainer pump.

To address the NRC concern with HPCS diesel generator operation in room temperature below 65°F, CEI will demonstrate, during preoperational testing, the engine's capability to start and accept load within 10 seconds at an ambient room temperature of approximately 40°F. In addition, required monthly surveillance testing will demonstrate engine start tests over a range of room temperatures. Additional parameters that will be monitored prior to the monthly test include: room and engine block temperatures on the day before and day of the test, and temperatures of the lube oil and cooling water systems. An assessment of the impact of ambient temperatures on the diesel generator starting

performance will be made by identifying and trending the frequency of test failures at room temperatures below 65°F. Visual inspection for wear will be included in maintenance procedures when the unit is dismantled for overhaul. (NOTE: A failure of a D/G start test results in increased test frequency per R. G. 1.108 and will provide additional data points).

After 24 months, an evaluation of the D/G performance during monthly testing will be submitted to the NRC along with justification for continued operation or proposed design modifications to either the HPCS D/G room HVAC system or the engine cooling water system to assure the engine is suitably pre-heated and improve starting reliability.

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430.40 (3) Partial Describe the protective features provided to prevent unacceptable crankcase explosion and to mitigate the consequences of such an event.

Response

A crankcase pressure detector is provided for the HPCS diesel engine to detect change in the normally negative crankcase pressure to a positive pressure. If the crankcase pressure should become positive, the high crankcase pressure alarm annunciates. The oil relief valve is released and lube oil pressure to the oil pressure switch is relieved. Low lube oil pressure at the switch will initiate engine shutdown during the test mode of operation. During other modes of operation, the low lube oil pressure trip signal is bypassed as required by Regulatory Guide 1.9. A local high crankcase pressure alarm and a diesel generator trouble alarm in the control room are provided. In addition, relief ports will be provided prior to fuel load to relieve crankcase overpressure on the HPCS diesel engine.