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PWR Project Directorate #5
U. S. Nuclear Regulatory Commission
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
FSAR Update on Diesel Generators

Dear Mr. Noonan:

Enclosed are mark-ups of FSAR pages concerning diesel generators. The revisions shown are a result of an update and consistency check. These revisions will be incorporated into a future FSAR amendment. These pages are being provided to assist in the review of the South Texas Project's Draft Safety Evaluation Report.

If you should have any questions on this matter, please contact Mr. M. E. Powell at (713) 993-1328.

Very truly yours,

M. R. Wisenburg
Manager, Nuclear Licensing

REP/yd

Attachment: FSAR Section 3.9 and 9.5 pages

A001
1/1

L1/NRC/rp

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Revised 12/2/85

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TABLE 3.9-1.1

LIST OF ACTIVE COMPONENTS

Pump	System	ANS Safety Class	
Containment Spray Pump 1, 2, 3	CSS	2	
Boric Acid Transfer Pump 1, 2	CVCS	3	
Centrifugal Charging Pump 1, 2	CVCS	2	41
High-Head Safety Injection Pump 1, 2, 3	SIS	2	
Low-Head Safety Injection Pump 1, 2, 3	SIS	2	32
Spent Fuel Pool Pump 1, 2	SFPCCS	3	41
Auxiliary Feedwater Pump 1, 2, 3, 4	AFW	3*	
CCW Pump 1, 2, 3	CCW	3*	
ECW Pump 1, 2, 3	ECW	3*	
ECW Screen Wash Pump 1, 2, 3	ECW	3*	
ECW Traveling Water Screens 1,2,3	ECW	3*	41
Reactor Makeup Water Pump 1,2	RMWS	3*	
Essential Chilled Water Pumps 1,2,3	ESSCW	3*	41
ECW Self Cleaning Strainers 1,2,3	ECW	3*	

Insert A

*BOP scope of supply

INSERT A

Engine Driven Jacket Water Pump	DG	3
Engine Driven Lube Oil Pump	DG	3

TABLE 9.5.6-1

DIESEL GENERATOR STARTING SYSTEM

DESIGN DATA

Equipment	Quantity Per Unit	Data
*AC motor air compressor	6 (2 per diesel)	32.2 ft^3/min, 15 hp, 460 v, 3 phase, 60 Hz
Air receiver	6 (2 per diesel)	Volume: 83 ft^3, normal operating pressure ~~265~~ 250 psig.

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Q430.5

*Diesel Generator	Air Compressor No.	Power Source
11	11	MCC - 1A5
11	12	MCC - 1A5
12	13	MCC - 1B5
12	14	MCC - 1B5
13	15	MCC - 1C5
13	16	MCC - 1C5

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6. Once in storage, the DGFOST and the AFOST fuel oil is sampled periodially in accordance with ASTM D2276-78 and verified that particulate contamination is within limits. 41 Q40.20

Water removal and sampling for total particulates for the yard AFOST will be by administrative procedure at the same periodic interval as the DGFOSTs (i.e., at least every 31 days). Periodic removal of water from the DGFOST will be in accordance with the Technical Specifications. 52

9.5.4.5 Instrumentation Application. The three DGs are provided with independent fuel oil supply systems. Each fuel oil supply system is provided with its own instrumentation. Applicable portions of the fuel system instrumentation are designed to seismic Category I requirements, as defined in Section 3.2. 41

Each DGFOST is provided with level indication in the main control room at the DG local panel and locally at the tank. High-level, low-level and low-low-level alarms are provided for each tank. These alarms annunciate in the main control room (~~common trouble alarm~~ as high-low alarm and low-low alarm) and at the DG local panel (high-low only). 41

9.5.5 Diesel Generator Cooling Water System

9.5.5.1 Design Bases. The DG Cooling Water System (DGCWS) is designed to circulate sufficient quantities of cooling water to dissipate heat given off by the air coolers, lube oil coolers, and engine water jackets, under full load conditions. 29 Q430.49N

The DGCWS is designed to seismic Category I and SC 3 requirements. The engine mounted components are designed in accordance with the DEMA requirement and meets ANSI B31.1, ANSI N45.2, seismic Category I requirements, and 10CFR50 Appendix B QA (see Table 9.5.4-1). In addition, each DG and its associated Closed-Loop Cooling Water System are located in a physically separated tornado-, flood-, and missile-proof structure in the DGB, and are protected from the effects of moderate-energy line breaks. 52 29 Q430 49N

9.5.5.2 System Description. The DGCWS consists of a Closed-Loop Cooling Water System and an Open-Loop Cooling Water System. A schematic diagram for both systems is shown on Figure 9.5.5-1. Major components and design data are provided in Table 9.5.5-1. 41 29 Q430.49N

9.5.5.2.1 Closed-Loop Cooling Water System: A forced-circulation Jacket Closed-Loop Cooling Water System is furnished for each DG to provide cooling of the engine by means of a water jacket and to supply heat to the combustion air, if necessary, via two air heaters/intercoolers. 41

This system consists of the following components: 29 Q430.49N

1. Engine-driven jacket water pump
2. AC motor-driven jacket water standby pump
3. AC motor-driven circulation pump
4. Jacket water cooler
5. An automatic thermostatic valve

The equipment is located within the DG compartments and therefore is protected from tornado winds, external missiles, flooding, and the effects of moderate-energy line breaks (see Chapter 3).

9.5.7.2 System Description. The lubrication system of each engine includes a direct engine-driven lube oil pump, an ac motor-driven lube oil standby pump, an ac motor-driven circulation pump, lube oil filters and strainers, a lube oil cooler, a thermostatic valve, an electric lube oil heater, and all necessary valves, fittings, piping, and instrumentation. The standby pump and circulation pump motors are powered from 480 V Class 1E motor control centers. A schematic of the DG Lubrication System is shown on Figure 9.5.7-1. | 41 | 29 Q430. 54N

Table 9.5.7-1 lists the major components in the lubrication system and their design data.

The engine-driven lube oil pump has sufficient capacity to ensure adequate lubrication of all wearing parts as required. The ac motor-driven lube oil standby pump has sufficient capacity to replace the engine-driven pump should it fail. The lube oil pumps take oil from the lube oil sump through a strainer and deliver it to the thermostatic valve. This valve controls the lube oil temperature by bypassing a portion of the lube oil flow around the lube oil cooler. From the thermostatic valve and the lube oil cooler, the lube oil flows first through a full-flow oil filter and then through a duplex lube oil strainer. The lube oil then flows to the various engine components requiring lubrication and/or oil cooling and returns to the engine lube oil sump. | 41

Pressure relief valves are provided on the discharge of the oil pumps and on the engine supply header. A pressure regulator regulates oil pressure to the turbocharger. Oil flow is not monitored, while oil pressure and temperature are monitored. | 29 Q430 54N

Protective functions (including interlocks) for the DGs are discussed in Section 8.3.1. The low lube oil pressure protective function remains operational during periodic testing of the DGs. However, during operation of the DG this trip is automatically bypassed. The bypassed protective function is alarmed in the main control room. | 41 Q430. 54N

The oil strainer may be manually bypassed for cleaning during operation. If necessary for plant protection, the filter can be manually bypassed for a short duration. | 52

The system also includes a standby prelubricating and preheating system to keep the engine ready for quick starts. It consists of an ac motor-driven circulation pump, which takes suction from the engine lube oil sumps, and an electric heater which comes on when lube oil temperature is 120°F falling and turns off at 130°F rising, and an electric heater, which heats the lube oil to operating temperature. From the heater, the lube oil flows through the main oil filter and then to the various engine components requiring lubrication. This pump starts when the engine rpm falls below 280. | 41 | 41

Essential cooling water at a flowrate of 300 gal/min is the source of cooling water for the lube oil coolers. Normal inlet temprature for this water is 95°F while the normal outlet temperature is 115°F. Maximum inlet temperature is 115°F while the maximum outlet temperature is 135°F. Heat removal rate is | 29 Q430. 53N

approximately 2,960,000 Btu/hr for the above conditions which is technically compatible with the engine manufacturer recommendations.

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The engine is equipped with two low oil pressure shutdown switches to stop the engine, in the test mode, in case oil pressure drops to 30 psig, which could result from insufficient oil inventory. One of these switches is located in the main header and the other one is located downstream of the turbocharger pressure regulator. System leakage is routed to floor drains which are piped to individual sumps which are then pumped to the oily waste system for processing.

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A sample of the lube oil is taken prior to the initial fill for analysis. Subsequent samples are obtained from the prefilter drain or instrument bleeding connections. If the sample fails to meet specifications, the lube oil is drained through the permanent connections from the auxiliary skid routed outside the DGB to a truck via a fill station. A fill connection is also provided at this station. The initial frequency for sampling the diesel lube oil will be at least monthly. This frequency may be revised based on evaluations of factors such as plant operating experience, industry experience, and vendor recommendations. This sampling will be governed by plant procedures which will be in place prior to fuel load. The appropriate plant personnel will be trained in their use.

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9.5.7.3 System Evaluation. The lube oil system for each DG is completely independent of the lube oil systems of the other DGs. Therefore, failure of one lube oil system will result in loss of only one DG. The remaining DGs will be adequate to safely shut down the plant or mitigate the effects of a LOCA during LOOP conditions. A failure modes and effects analysis is provided in Table 9.5.5-2.

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9.5.7.4 Inspection and Testing Requirements. The DG Lubrication System will be inspected and tested during the regularly scheduled tests of the DGs. Inservice inspection shall be performed in accordance with the ASME B&PV Code, Section XI.

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9.5.7.5 Instrumentation. A common trouble alarm will be provided in the main control room and individual alarms in the local panel for low oil pressure, high and low oil temperature, high and low lube oil level, high filter and high strainer differential pressures. Indication is provided in the main control room and locally for oil pressure and oil temperature~~ at the inlet to the engine~~. Indication is also provided locally for lube oil level in the crank case. The Lube Oil System indications and alarms are summarized in Table 9.5.7-2.

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The initial calibration frequency for the instruments associated with the diesel lubrication system will be at least once every 18 months. This frequency may be revised based on evaluations of factors such as plant operating experience, industry experience, and vendor recommendations.

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The operator action required following alarm actuation will be specified in the annunciator response procedure which is currently under development.

These actions will be consistent with the manufacturer's guidelines. This procedure will be available for review prior to fuel load. Alarms are verified operable as described in Section 13.5.2.