

5.5 Programs and Manuals

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5.5.13 Diesel Fuel Oil Testing Program (continued)

3. a clear and bright appearance with proper color or a water and sediment content within limits;
- b. Other properties for ASTM 2D fuel oil are within limits within 31 days following sampling and addition to storage tanks; and
- c. Total particulate concentration of the fuel oil is  $\leq 10$  mg/l when tested every 31 days.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Diesel Fuel Oil Testing Program test frequencies.

5.5.14 Technical Specifications (TS) Bases Control Program

This program provides a means for processing changes to the Bases of these Technical Specifications.

- a. Changes to the Bases of the TS shall be made under appropriate administrative controls and reviews.
- b. Licensees may make changes to Bases without prior NRC approval provided the changes do not require either of the following:
  1. a change in the TS incorporated in the license; or
  2. a change to the updated FSAR or Bases that requires NRC approval pursuant to 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the UFSAR.
- d. Proposed changes that meet the criteria of Specification 5.5.14.b.1 or 5.5.14.b.2 above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without prior NRC approval shall be provided to the NRC on a frequency consistent with 10 CFR 50.71(e), with approved exemptions.

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(continued)

**SURVEILLANCE REQUIREMENTS (continued)**

<b>SURVEILLANCE</b>	<b>FREQUENCY</b>
SR 3.8.3.2 Verify lubricating oil inventory is $\geq$ 400 gal.	31 days
SR 3.8.3.3 Verify fuel oil properties of new and stored fuel oil are tested in accordance with, and maintained within the limits of, the Diesel Fuel Oil Testing Program.	In accordance with the Diesel Fuel Oil Testing Program
SR 3.8.3.4 Verify each DG air start receiver pressure is $\geq$ 210 psig.	31 days
SR 3.8.3.5 Check for and remove accumulated water from each fuel oil storage tank.	31 days

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**SURVEILLANCE REQUIREMENTS (continued)**

tests are to be conducted prior to adding the new fuel to the storage tank(s). The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM D4057 (Ref. 7);
- b. Verify in accordance with the tests specified in ASTM D975 (Ref. 7) that the sample has a kinematic viscosity at 40°C of  $\geq 1.9$  centistokes and  $\leq 4.1$  centistokes, and a flash point of  $\geq 125^\circ\text{F}$ ; and
- c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176 (Ref. 7) or a water and sediment content within limits when tested in accordance with ASTM D2709 or D1796 (Ref. 7); and
- d. Verify that the new fuel oil has an absolute specific gravity at 60/60°F of  $\geq 0.83$  and  $\leq 0.89$  when tested in accordance with ASTM D1298 or an API gravity at 60°F of  $\geq 27^\circ$  and  $\leq 39^\circ$  when tested in accordance with ASTM D287 (Ref. 7).

Failure to meet any of the above limits, except for clear and bright, is cause for rejecting the fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks. If the fuel oil fails on clear and bright, it may be accepted if it passes water and sediment. The specifications for water and sediment recognize that a small amount of water and sediment is acceptable. Thus, this test may be used after a clear and bright test to provide a more quantitative result.

Within 31 days following the initial new fuel oil sample, the fuel oil is analyzed to establish that the other properties specified in Table 1 of ASTM D975 (Ref. 7) are met for new fuel oil when tested in accordance with ASTM D975 (Ref. 7), except that the analysis for sulfur may be performed in accordance with ASTM D1552 (Ref. 7), D4294 (Ref. 7) or ASTM D2622 (Ref. 7). The 31 day period is acceptable because the fuel oil properties of interest, even if they were not within stated limits, would not have an immediate effect on DG operation. This Surveillance ensures the availability of high quality fuel oil for the DGs.

Fuel oil degradation during long term storage shows up as an increase in particulate, due mostly to oxidation. The presence of particulate does not mean the fuel oil will not burn properly in a diesel engine. The particulate can cause fouling of filters and fuel oil injection equipment, however, which can cause engine failure.

Particulate concentrations should be determined based on ASTM D6217 (Ref. 7). This test method is used for assessing the mass quantity of

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**SURVEILLANCE REQUIREMENTS (continued)**

particulates in middle distillate fuels, which includes 2-D diesel fuel. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. For those designs in which the total stored fuel oil volume is contained in two or more interconnected tanks, each tank must be considered and tested separately.

The Frequency of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Frequency intervals.

**SR 3.8.3.4**

This Surveillance ensures that, without the aid of the refill compressor, sufficient air start capacity for each DG is available. The system design requirements provide for a minimum of five engine start cycles without recharging. A start cycle is defined by the DG vendor, but usually is measured in terms of time (seconds of cranking) or engine cranking speed. The pressure specified in this SR is intended to reflect the lowest value at which the five starts can be accomplished.

The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources and other indications available in the control room, including alarms, to alert the operator to below normal air start pressure.

**SR 3.8.3.5**

Microbiological fouling is a major cause of fuel oil degradation. There are numerous bacteria that can grow in fuel oil and cause fouling, but all must have a water environment in order to survive. Removal of water from the fuel storage tanks once every 31 days eliminates the necessary environment for bacterial survival. This is the most effective means of controlling microbiological fouling. In addition, it eliminates the potential for water entrainment in the fuel oil during DG operation. Water may come from any of several sources, including condensation, ground water, rain water, and contaminated fuel oil, and from breakdown of the fuel oil by bacteria. Frequent checking for and removal of accumulated water minimizes fouling and provides data regarding the watertight integrity of the fuel oil system. The Surveillance Frequencies are established by

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**SURVEILLANCE REQUIREMENTS (continued)**

Regulatory Guide 1.137 (Ref. 2). This SR is for preventive maintenance. The presence of water does not necessarily represent failure of this SR, provided the accumulated water is removed during performance of the Surveillance.

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**REFERENCES**

1. UFSAR, Section 9.5.4.2.
2. Regulatory Guide 1.137.
3. ANSI N195-1976, Appendix B.
4. UFSAR, Chapter 6.
5. UFSAR, Chapter 15.
6. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).
7. ASTM Standards: D4057; D975; D1298; D4176; D2709; D4294; D6217; D1552; D2622; D1796; and D287.