



NUCLEAR ENERGY INSTITUTE

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April 27, 2001

Dr. William D. Beckner, Branch Chief
Technical Specifications Branch
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Forwarding of TSTF's

PROJECT NUMBER: 689

Dear Dr. Beckner:

Enclosed is technical specification traveler TSTF 474 for NRC review. It supersedes TSTF-120, therefore TSTF 120 is withdrawn. TSTF 474 has been assigned a "high" priority.

Please contact me at (202) 739-8081 or Mike Schoppman at (202) 739-8011 if you have any questions or desire further communication regarding these recommended changes.

Sincerely,

Anthony R. Pietrangelo

Enclosure

c: Leslie A. Hill, NRC
Stewart L. Magruder, NRR/DRPM
Donald Hoffman, Excel
Technical Specification Task Force

Industry/TSTF Standard Technical Specification Change Traveler

Revision to TS 5.5.13 and associated TS Bases for Diesel Fuel Oil

Classification: 1) Technical Change

Priority: 1) High

NUREGs Affected: ☒ 1430 ☒ 1431 ☒ 1432 ☒ 1433 ☒ 1434

Description:

The proposed changes revise TS 5.5.13, "Diesel Fuel Oil Testing Program" to relocate the specific American Society for Testing and Materials (ASTM) Standard references from the Administrative Controls Section of TS to a licensee-controlled document. In addition to the "clear and bright" test used to establish the acceptability of new fuel oil for use prior to addition to storage tanks, an option to allow alternate water and sediment content test to be performed to establish the acceptability of new fuel oil has been added. The TS Bases 3.8.3, "Diesel Fuel Oil," are revised to provide the current ASTM standards. The proposed change supersedes TSTF-120, "Simplify Fuel Oil Sampling."

Justification:**Background**

TS 5.5.13 implements required testing of both new fuel oil and stored fuel oil. The Diesel Fuel Oil Testing Program includes sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards.

The tests of fuel oil are a means of determining whether new fuel oil is of the appropriate grade (i.e., proper fuel oil quality) and of assuring it has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion (i.e., proper fuel oil quality).

The purpose of the Diesel Fuel Oil Program is to establish the following.

- Acceptability of new fuel oil for use prior to addition to storage tanks;
- Other properties of new fuel oil are within limits within 30 days following sampling and addition to storage tanks; and
- Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276 Method A-2 or A-3

4/20/2001

Need for Change

The proposed changes revise TS 5.5.13.c to relocate the specific American Society for Testing and Materials (ASTM) Standard references from the Administrative Controls Section of TS to a licensee-controlled document. In addition, the "clear and bright" test used to establish the acceptability of new fuel oil for use prior to addition to storage tanks (i.e., TS 5.5.13.a.3) has been expanded to allow a water and sediment content test to be performed to establish the acceptability of new fuel oil. The TS Bases 3.8.3, "Diesel Fuel Oil," are revised to provide the current ASTM standards.

The proposed changes to TS 5.5.13.c will provide the flexibility to maintain the capability to implement the required testing of both new fuel oil and stored fuel oil, including sampling and testing requirements, in accordance with applicable ASTM Standards whenever there are changes in Environmental Protection Agency (EPA) regulations for fuel oil or newer editions of the ASTM Standards. Currently, the use of a different ASTM Standard than specified in TS 5.5.13.c or a newer edition of the ASTM Standard is not permitted without an amendment to the TS. NUREG-1431, "Standard Technical Specifications Westinghouse Plants," Revision 1, previously relocated all references to ASTM Standards in TS to licensee-controlled documents, with the exception of TS 5.5.13.c.

TS 5.5.13.a.3 which requires performance of the "clear and bright" test, used to establish the acceptability of new fuel oil for use prior to addition to storage tanks, has been expanded to allow a water and sediment content test to be performed to establish the acceptability of new fuel oil. ASTM D4176-93, "Standard Test Method for Free Water and Particulate Contamination in Distillate Fuels (Visual Inspection Procedures)," verifies that the new fuel oil has a clear and bright appearance with proper color. The "clear and bright" test is only applicable to fuel oils that meet the ASTM D4176 color rating requirements (i.e., an ASTM D1500, "Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)," color rating of five or less). The "clear and bright" test is a qualitative test for determining free water and particulate contamination in distillate fuels and is, therefore, subject to human interpretation. For example, if an attempt is made to use the qualitative "clear and bright" test with darker colored fuels (e.g., for high sulfur fuel oil that has been dyed in accordance with EPA mandated requirements), the presence of free water or particulate could be obscured and missed by the viewer. Therefore, TS 5.5.13.a.3 has been expanded to allow a water and sediment content test. The water and sediment content test is a quantitative test using centrifuge methods. As discussed in ASTM D975-98 and ASTM D975-81, ASTM D2709, "Test Method for Water and Sediment in Distillate Fuels by Centrifuge," or ASTM D1796, "Standard Method for Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)," are acceptable standards for the water and sediment content test. The use of ASTM D1796-83 was endorsed by the NRC in Amendment No. 101 for the Wolf Creek Generating Station.

Proposed Change

The proposed changes revise TS 5.5.13 as follows.

- TS 5.5.13.a.3 currently states, "a clear and bright appearance with proper color;"
TS 5.5.13.a.3 has been revised to state, "a clear and bright appearance with proper color or a water and sediment content within limits;"
- TS 5.5.13.c currently states, "Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276 Method A-2 or A-3."
TS 5.5.13.c has been revised to state, "Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days."

The proposed changes revise Bases B 3.8.3 to reference the current specific ASTM Standards. The Bases for SR 3.8.3.3 is revised to indicate that the API gravity is tested in accordance with ASTM D1298 and to provide an additional method (ASTM D4294) for sulfur testing.

4/20/2001

Justification

The initial conditions of Design Basis Accident (DBA) and transient analyses assume Engineered Safety Feature (ESF) systems are OPERABLE. The DGs are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to ESF systems so that fuel, Reactor Coolant System, and containment design limits are not exceeded. For proper operation of the DGs, it is necessary to ensure the proper quality of the fuel oil. The DG fuel oil properties governed by the TS 5.5.13 are the water and sediment content, the kinematic viscosity, specific gravity or API gravity, and particulate level.

The Diesel Fuel Oil Testing Program requires fuel oil testing to be performed in accordance with applicable ASTM Standards. The ASTM develops and promulgates standards for sampling and analysis of fuel oils in the form of ASTM Standards, which are universally accepted throughout the United States as the best available practices to assure an acceptably low level of impurities and contaminants in fuel oil. Implementing the required testing specified in the Diesel Fuel Oil Program and the proposed TS and Bases changes will continue to ensure the use of current applicable ASTM Standards to evaluate the quality of both new fuel oil and stored fuel oil designated for use in the DGs. The TS will continue to assure that the applicable ASTM Standards are used.

Since relocating the specific ASTM Standard references from TS 5.5.13.c to a licensee-controlled document will not affect the fuel oil properties, the OPERABILITY of the DGs will be maintained. TS 3.8.3 requires fuel oil testing to be performed in accordance with the Diesel Fuel Oil Testing Program, and TS 5.5.13 provides the programmatic requirements for fuel oil testing. The proposed changes relocate the specific ASTM Standard references from TS 5.5.13.c to a licensee-controlled document. Changes to the licensee-controlled document are performed in accordance with the provisions of 10 CFR 50.59, "Changes, tests, and experiments." Thus, adequate control over changes to the licensee-controlled document (i.e., in particular changes to the applicable ASTM Standards) exist to allow relocation of the specific ASTM Standard references to a licensee-controlled document.

ASTM D2709-96e or ASTM D1796-83 are the same ASTM Standards used to verify the water and sediment content is within limits 30 days following sampling and addition to the storage tanks as required by TS 5.5.13.b. Therefore, since ASTM D2709 or ASTM D1796 are currently used to verify the acceptability of new fuel oil for use prior to addition to the storage tanks, the use of these quantitative methods (i.e., water and sediment content) in lieu of ASTM D4176 (i.e., "clear and bright" test) does not introduce a different method that requires further evaluation prior to implementation. The Bases for SR 3.8.3.3 are revised to include the option of water and sediment content. ASTM D2709 is bracketed in its entirety to allow the use of either ASTM D2709 or ASTM D1796.

SR 3.8.3.2 requires fuel oil testing to be performed in accordance with the Diesel Fuel Oil Testing Program, and TS 5.5.13 provides the programmatic requirements for fuel oil testing. As such, detail of the specific ASTM Standard reference (i.e., ASTM D-2276 Method A-2 or A-3) is not required to ensure adequate protection of the public health and safety. Therefore, in order to provide the flexibility, the proposed changes relocate the specific ASTM Standard references from TS 5.5.13.c to a licensee-controlled document. Relocation of the specific ASTM Standard references will provide the flexibility needed to maintain state-of-the-art technology in fuel oil sampling and analysis methodology. Changes to the licensee-controlled document are performed in accordance with the provisions of 10 CFR 50.59. Thus, adequate controls exist to allow relocation of the specific ASTM Standard references to a licensee-controlled document.

The Bases for SR 3.8.3.3 is clarified to indicate that the API gravity is tested in accordance with ASTM D1298 since ASTM D975 does not specifically address API gravity testing.

The Bases for SR 3.8.3.3 are revised to indicate that the analysis for sulfur in diesel can be performed by a test based on a non-dispersive X-ray fluorescence spectrometry (ASTM D4294). This is a more up-to-date method and would be helpful in monitoring sulfur content in diesel fuel oil. This method could yield results of a comparable accuracy to the other two methods. The use of this additional analysis method was approved in Amendment No. 101 for the Wolf Creek Generating Station.

The Bases for SR 3.8.3.3 is revised to change ASTM D2276 to ASTM D5452. ASTM D5452 supersedes ASTM D2276.

The proposed TS and Bases changes will continue to ensure the quality of both new fuel oil and stored fuel oil designated for use in the DGs. Therefore, the OPERABILITY of the DGs is unaffected.

4/20/2001

Determination of No Significant Hazards Considerations

A change is proposed to the Improved Standard Technical Specifications, NUREGs 1430 - 1434, TS 5.5.13, "Diesel Fuel Oil Testing Program," and Bases B 3.8.3, "Diesel Fuel Oil."

In accordance with the criteria set forth in 10 CFR 50.92, the Industry has evaluated these proposed Improved Standard Technical Specification changes and determined they do not represent a significant hazards consideration. The following is provided in support of this conclusion.

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes relocate the specific American Society for Testing and Materials (ASTM) Standard references from the Administrative Controls Section of Technical Specifications (TS) to a licensee-controlled document. Since any change to the licensee-controlled document will be evaluated pursuant to the requirements of 10 CFR 50.59, "Changes, tests and experiments," no increase in the probability or consequences of an accident previously evaluated is involved. In addition, the "clear and bright" test used to establish the acceptability of new fuel oil for use prior to addition to storage tanks has been expanded to allow a water and sediment content test to be performed to establish the acceptability of new fuel oil. The proposed changes revise Bases B 3.8.3 to reference the current specific ASTM Standards. The Bases for SR 3.8.3.3 is revised to indicate that the API gravity is tested in accordance with ASTM D1298 and to provide an additional method (ASTM D4294) for sulfur testing.

Relocating the specific ASTM Standard references from the TS to a licensee-controlled document, allowing a water and sediment content test to be performed to establish the acceptability of new fuel oil, and revising the TS Bases will not affect nor degrade the ability of the emergency diesel generators (DGs) to perform their specified safety function. Fuel oil quality will continue to meet ASTM requirements.

The proposed changes do not adversely affect accident initiators or precursors nor alter the design assumptions, conditions, and configuration of the facility or the manner in which the plant is operated and maintained. The proposed changes do not alter or prevent the ability of structures, systems, and components (SSCs) from performing their intended function to mitigate the consequences of an initiating event within the assumed acceptance limits. The proposed changes do not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. Further, the proposed changes do not increase the types and amounts of radioactive effluent that may be released offsite, nor significantly increase individual or cumulative occupational/public radiation exposures.

Therefore, the changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously analyzed?

The proposed changes relocate the specific ASTM Standard references from the Administrative Controls Section of TS to a licensee-controlled document. In addition, the "clear and bright" test used to establish the acceptability of new fuel oil for use prior to addition to storage tanks has been expanded to allow a water and sediment content test to be performed to establish the acceptability of new fuel oil. The proposed changes revise Bases B 3.8.3 to reference the current specific ASTM Standards. The Bases for SR 3.8.3.3 is revised to indicate that the API gravity is tested in accordance with ASTM D1298 and to provide an additional method (ASTM D4294) for sulfur testing.

The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any new or different requirements or eliminate any existing requirements. The changes do not alter assumptions made in the safety analysis and licensing basis. Therefore, the changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

4/20/2001

3. Does this change involve a significant reduction in the margin of safety?

The proposed changes relocate the specific ASTM Standard references from the Administrative Controls Section of TS to a licensee-controlled document. Instituting the proposed changes will continue to ensure the use of current applicable ASTM Standards to evaluate the quality of both new and stored fuel oil designated for use in the emergency DGs. The detail associated with the specific ASTM Standard references is not required to be in the TS to provide adequate protection of the public health and safety, since the TS still retain the requirement for compliance with the applicable ASTM Standard. Changes to the licensee-controlled document are performed in accordance with the provisions of 10 CFR 50.59. Should it be determined that future changes involve a potential reduction in a margin of safety, NRC review and approval would be necessary prior to implementation of the changes. This approach provides an effective level of regulatory control and provides for a more appropriate change control process.

The "clear and bright" test used to establish the acceptability of new fuel oil for use prior to addition to storage tanks has been expanded to allow a water and sediment content test to be performed to establish the acceptability of new fuel oil. The proposed changes revise Bases B 3.8.3 to reference the current specific ASTM Standards. The Bases for SR 3.8.3.3 is revised to indicate that the API gravity is tested in accordance with ASTM D1298 and to provide an additional method (ASTM D4294) for sulfur testing. The level of safety of facility operation is unaffected by the proposed changes since there is no change in the intent of the TS requirements of assuring fuel oil is of the appropriate quality for emergency DG use. The proposed changes provide the flexibility needed to maintain state-of-the-art technology in fuel oil sampling and analysis methodology.

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NRC Contact:	Tomlinson, Ed	301-415-3137	ebt@nrc.gov

Revision History

OG Revision 0

Revision Status: Closed

Revision Proposed by: WOG

Revision Description:
Original Issue

Owners Group Review Information

Date Originated by OG: 08-Dec-99

Owners Group Comments
(No Comments)

Owners Group Resolution: Superceeded Date:

OG Revision 1

Revision Status: Closed

Revision Proposed by: WOG

Revision Description:
Complete replacement of Revision 0.

4/20/2001

OG Revision 1**Revision Status: Closed****Owners Group Review Information**

Date Originated by OG: 21-Jun-00

Owners Group Comments**WOG Comments:**

Remove brackets from 5.5.13, #3 on page 5.0-16 and modify #3

Remove the brackets from SR 3.8.3.3 on page B 3.8-46

Develop the WOG and delete the specific ASTM standards and state "the applicable ASTMs". Millstone to provide SER to develop SER quality justification.

Replaced on 10/15/00.

Owners Group Resolution: Superseded Date: 01-Aug-00

OG Revision 2**Revision Status: Active****Next Action: NRC**

Revision Proposed by: WOG

Revision Description:

From the 8/1/00 Working Group meeting the action was to prepare the justification for the proposed Owners Group Traveler. Also, at this meeting, it was discussed and the action was to modify the Bases to only refer to the applicable ASTM Standards. Revision 2 maintains the applicable ASTM standards in the TS Bases since some plants may have a program document and others may not such that it would be appropriate to maintain the ASTM Standards in the TS Bases. Additionally, the use of either ASTM D2709 or ASTM D1796 for the water and sediment content test.

Owners Group Review Information

Date Originated by OG: 29-Nov-00

Owners Group Comments

(No Comments)

Owners Group Resolution: Approved Date: 29-Nov-00

TSTF Review Information

TSTF Received Date: 17-Jan-01

Date Distributed for Review 14-Feb-01

OG Review Completed: ☒ BWO ☒ WOG ☒ CEOG ☒ BWROG**TSTF Comments:**

Applicable to all NUREGs

TSTF to withdraw TSTF-120.

TSTF Resolution: Approved Date: 14-Feb-01

NRC Review Information

NRC Received Date: 24-Apr-01

NRC Comments:

(No Comments)

Final Resolution: NRC Action Pending

Final Resolution Date:

4/20/2001

OG Revision 2

Revision Status: Active

Next Action: NRC

Incorporation Into the NUREGs

File to BBS/LAN Date:

TSTF Informed Date:

TSTF Approved Date:

NUREG Rev Incorporated:

Affected Technical Specifications

Ref. 3.8.3 Bases	Diesel Fuel Oil, Lube Oil, and Starting Air	
SR 3.8.3.3 Bases	Diesel Fuel Oil, Lube Oil, and Starting Air	
5.5.13	Diesel Fuel Oil Testing Program	NUREG(s)- 1430 1431 1432 Only
5.5.10	Diesel Fuel Oil Testing Program	NUREG(s)- 1433 1434 Only

4/20/2001

Insert 1

or a water and sediment content within limits

Insert 2

when tested in accordance with ASTM D1298-[] (Ref. 6)

Insert 3

or a water and sediment content within limits when tested in accordance with
[ASTM D2709-[]]

Insert 4

, or ASTM D4294-[]

Insert 5

ASTM Standards: D4057-[]; D975-[]; D1298-[]; D4176-[]; [D2709-[];] D1552-[];
D2622-[]; D4294-[]; D5452-[].

5.5 Programs and Manuals

5.5.13 Diesel Fuel Oil Testing Program (continued)

2. a flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and
3. a clear and bright appearance with proper color; Insert 1
- b. Other properties for ASTM 2D fuel oil are within limits within 30 days following sampling and addition to storage tanks; and
- c. Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A-2 or A-3.

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 involve 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 involves an unreviewed safety question as defined in 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the FSAR.
- d. Proposed changes that meet the criteria of 5.5.14b 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).

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.8.3.2 (continued)

operation for each DG. The [500] gal requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM D4057-[] (Ref. 6);
- b. Verify in accordance with the tests specified in ASTM D975-[] (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 or an API gravity at 60°F of $\geq 27^\circ$ and $\leq 39^\circ$; a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 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. 6).

Insert 3

(continued)

BASES

SURVEILLANCE
REQUIREMENTSSR 3.8.3.3 (continued)

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

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. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1552-[] (Ref. 6) or ASTM D2622-[] (Ref. 6). 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.

Insert 4

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 in accordance with ASTM D2276 [] Method A (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. [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.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.8.3.6 (continued)

10 year intervals by Regulatory Guide 1.137 (Ref. 2), paragraph 2.f. This SR also requires the performance of the ASME Code, Section XI (Ref. 8), examinations of the tanks. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions, or their equivalent, rather than soap or detergents. This SR is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this SR, provided that accumulated sediment is removed during performance of the Surveillance.

REFERENCES

1. FSAR, Section [9.5.4.2].
 2. Regulatory Guide 1.137.
 3. ANSI N195-1976, Appendix B.
 4. FSAR, Chapter [6].
 5. FSAR, Chapter [15].
 6.

~~ASTM Standards: D4057-[] ; D975-[] ;
D4176-[] ; D1552-[] ; D2622-[] ;
D2276-[] , Method A.~~

Insert 5
 7. ASTM Standards, D975, Table 1. -[]
 8. ASME, Boiler and Pressure Vessel Code, Section XI.
-

5.5 Programs and Manuals

5.5.13 Diesel Fuel Oil Testing Program (continued)

2. a flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and
3. a clear and bright appearance with proper color; Insert 1
- 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 < 10 mg/l when tested every 31 days (in accordance with ASTM D-2276, Method A-2 or A-3)

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 involve 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 involves an unreviewed safety question as defined in 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the FSAR.
- d. Proposed changes that meet the criteria of Specification 5.5.14b 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).

(continued)

BASES

SURVEILLANCE
REQUIREMENTSSR 3.8.3.2 (continued)

operation for each DG. The [500] gal requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM D4057-[] (Ref. 6);
- b. Verify in accordance with the tests specified in ASTM D975-[] (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 or an API gravity at 60°F of $\geq 27^\circ$ and $\leq 39^\circ$, a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 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. 6).

Insert 2

Insert 3

(continued)

BASES

SURVEILLANCE
REQUIREMENTSSR 3.8.3.3 (continued)

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

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. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1552-[] (Ref. 6) or ASTM D2622-[] (Ref. 6). 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.

Insert 4

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 in accordance with ASTM D2276 [] Method A (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. [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.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)SR 3.8.3.6

Draining of the fuel oil stored in the supply tanks, removal of accumulated sediment, and tank cleaning are required at 10 year intervals by Regulatory Guide 1.137 (Ref. 2), paragraph 2.f. This SR also requires the performance of the ASME Code, Section XI (Ref. 8), examinations of the tanks. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions, or their equivalent, rather than soap or detergents. This SR is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this SR, provided that accumulated sediment is removed during performance of the Surveillance.

REFERENCES

1. FSAR, Section [9.5.4.2].
2. Regulatory Guide 1.137.
3. ANSI N195-1976, Appendix B.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. ASTM Standards: D4057-[]; D975-[]; D4176-[]; D1552-[]; D2622-[]; D2276, Method A.
7. ASTM Standards, D975, Table 1. -[]
8. ASME, Boiler and Presser Vessel Code, Section XI.

5.5 Programs and Manuals (continued)

5.5.13 Diesel Fuel Oil Testing Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:
 1. An API gravity or an absolute specific gravity within limits,
 2. A flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and
 3. A clear and bright appearance with proper color; Insert 1
- 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 ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A-2 or A-3

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 involve either of the following:

A change in the TS incorporated in the license; or

A change to the updated FSAR or Bases that involves an unreviewed safety question as defined in 10 CFR 50.59.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS

SR 3.8.3.2 (continued)

operation for each DG. The [500] gal requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the unit staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate, detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM D4057-[] (Ref. 6);
- b. Verify in accordance with the tests specified in ASTM D975-[] (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 , or an API gravity at 60°F of $> 27^\circ$ and $\leq 39^\circ$, a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point $\geq 125^\circ\text{F}$; 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. 6).

Insert 2

Insert 3

(continued)

BASES

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REQUIREMENTS

SR 3.8.3.3 (continued)

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

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. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1552-[]

~~(Ref. 6) or~~ ASTM D2622-[] (Ref. 6). 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.

Insert 4

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 in accordance with ASTM ~~D2276~~ [] ~~Method A~~ (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. [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.

(continued)

BASES

SURVEILLANCE
REQUIREMENTS
(continued)SR 3.8.3.6

Draining of the fuel oil stored in the supply tanks, removal of accumulated sediment, and tank cleaning are required at 10 year intervals by Regulatory Guide 1.137 (Ref. 2), paragraph 2.f. This also requires the performance of the ASME Code, Section XI (Ref. 8), examinations of the tanks. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions, or their equivalent, rather than soap or detergents. This SR is for preventative maintenance. The presence of sediment does not necessarily represent a failure of this SR, provided that accumulated sediment is removed during performance of the Surveillance.

REFERENCES

1. FSAR, Section [9.5.4.2].
2. Regulatory Guide 1.137.
3. ANSI N195-1976, Appendix B.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6. ~~ASTM Standards: D4057-[] ; D975-[] ;~~
~~D4175-[] ; D1552-[] ; D2622-[] ;~~
~~S2276, Method A.~~ Insert 5
7. ASTM Standards, D975, Table 1. -[3]
8. ASME, Boiler and Pressure Vessel Code, Section XI.

5.5 Programs and Manuals (continued)

5.5.10 Diesel Fuel Oil Testing Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

- a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:
 1. an API gravity or an absolute specific gravity within limits,
 2. a flash point and kinematic viscosity within limits for ASTM 2D fuel oil, and
 3. a clear and bright appearance with proper color; Insert 1
- 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 < 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A-2 or A-3.

5.5.11 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 involve 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 involves an unreviewed safety question as defined in 10 CFR 50.59.

(continued)

BASES

SURVEILLANCE
REQUIREMENTSSR 3.8.3.1 (continued)

provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 3.8.3.2

This Surveillance ensures that sufficient lubricating oil inventory is available to support at least 7 days of full load operation for each DG. The [500] gal requirement is based on the DG manufacturer's consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG, when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer's recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run time are closely monitored by the plant staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate detrimental impact on diesel engine combustion. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM D4057-[] (Ref. 6);
- b. Verify in accordance with the tests specified in ASTM D975-[] (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 or an API gravity at 60°F of $\geq 27^\circ$ and $\leq 39^\circ$, a kinematic

Insert 2

(continued)

BASES

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REQUIREMENTS

SR 3.8.3.3 (continued)

viscosity at 40°C of ≥ 1.9 centistokes and ≤ 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. 6). Insert 3

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO concern since the fuel oil is not added to the storage tanks.

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. 6) are met for new fuel oil when tested in accordance with ASTM D975-[] (Ref. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1552-[] (Ref. 6) or ASTM D2622-[] (Ref. 6). 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.

Insert 4

Fuel oil degradation during long term storage shows up as an increase in particulate, mostly due to oxidation. The presence of particulate does not mean that 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 05452 should be determined in accordance with ASTM D2276 [] (Ref. 6) Method A. This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. [For those designs in which the total volume of stored fuel oil 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

(continued)

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(continued)

SR 3.8.3.6

Draining of the fuel oil stored in the supply tanks, removal of accumulated sediment, and tank cleaning are required at 10 year intervals by Regulatory Guide 1.137 (Ref. 2), paragraph 2.f. This SR is typically performed in conjunction with ASME Boiler and Pressure Vessel Code, Section XI (Ref. 7), examinations of the tanks. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions or their equivalent, rather than soap or detergents. This SR is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this SR, provided that accumulated sediment is removed during performance of the Surveillance.

REFERENCES

1. FSAR, Section [9.5.2].
2. Regulatory Guide 1.137.
3. ANSI N195, 1976.
4. FSAR, Chapter [6].
5. FSAR, Chapter [15].
6.

ASTM Standards: D4057-[]; D975-[]; D4176-[];
D1552-[]; D2622-[]; and D2276-[]
7. ASME, Boiler and Pressure Vessel Code, Section XI.

Insert 5

5.5 Programs and Manuals

5.5.10 Diesel Fuel Oil Testing Program (continued)

- a. Acceptability of new fuel oil for use prior to addition to storage tanks by determining that the fuel oil has:
 - 1. an API gravity or an absolute specific gravity within limits,
 - 2. a flash point and kinematic viscosity within limits for ASTM 2D fuel oil,
 - 3. a clear and bright appearance with proper color; Insert 1
- 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 ≤ 10 mg/l when tested every 31 days in accordance with ASTM D-2276, Method A-2 or A-3.

5.5.11 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 involve 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 involves an unreviewed safety question as defined in 10 CFR 50.59.
- c. The Bases Control Program shall contain provisions to ensure that the Bases are maintained consistent with the FSAR.
- d. Proposed changes that meet the criteria of 5.5.11b above shall be reviewed and approved by the NRC prior to implementation. Changes to the Bases implemented without

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BASES

SURVEILLANCE
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SR 3.8.3.1 (continued)

provided and unit operators would be aware of any large uses of fuel oil during this period.

SR 3.8.3.2

This Surveillance ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG. The 500 gal requirement is based on the DG manufacturer's consumption values for the run time of the DG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the DG when the DG lube oil sump does not hold adequate inventory for 7 days of full load operation without the level reaching the manufacturer's recommended minimum level.

A 31 day Frequency is adequate to ensure that a sufficient lube oil supply is onsite, since DG starts and run times are closely monitored by the plant staff.

SR 3.8.3.3

The tests listed below are a means of determining whether new fuel oil is of the appropriate grade and has not been contaminated with substances that would have an immediate detrimental impact on diesel engine combustion and operation. If results from these tests are within acceptable limits, the fuel oil may be added to the storage tanks without concern for contaminating the entire volume of fuel oil in the storage tanks. These tests are to be conducted prior to adding the new fuel to the storage tank(s), but in no case is the time between receipt of new fuel and conducting the tests to exceed 31 days. The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil in accordance with ASTM D4057-[] (Ref. 6);
- b. Verify in accordance with the tests specified in ASTM D975-[] (Ref. 6) that the sample has an absolute specific gravity at 60/60°F of ≥ 0.83 and ≤ 0.89 ~~for~~ an API gravity at 60°F of $\geq 27^\circ$ and $\leq 39^\circ$, a

Insert 2

(continued)

BASES

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REQUIREMENTSSR 3.8.3.3 (continued)

kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 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. 6). Insert 3

Failure to meet any of the above limits is cause for rejecting the new fuel oil, but does not represent a failure to meet the LCO since the fuel oil is not added to the storage tanks.

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. 6) are met for new fuel oil when tested in accordance with ASTM D975-[] (Ref. 6), except that the analysis for sulfur may be performed in accordance with ASTM D1522-[] ¹ (Ref. 6) or ASTM D2622-[] (Ref. 6). The 31 day period Insert 4 is acceptable because the fuel oil properties of interest, even if 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, mostly due to oxidation. The presence of particulate does not mean that the fuel oil will not burn properly in a diesel engine. However, the particulate can cause fouling of filters and fuel oil injection equipment, which can cause engine failure. D5452

Particulate concentrations should be determined in accordance with ASTM D2276-[] Method A (Ref. 6). This method involves a gravimetric determination of total particulate concentration in the fuel oil and has a limit of 10 mg/l. It is acceptable to obtain a field sample for subsequent laboratory testing in lieu of field testing. [For those designs in which the total volume of stored fuel oil is contained in two or more interconnected tanks, each tank must be considered and tested separately.]

The Frequency of this Surveillance takes into consideration fuel oil degradation trends indicating that particulate

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(continued)

SR 3.8.3.6

Draining of the fuel oil stored in the supply tanks, removal of accumulated sediment, and tank cleaning are required at 10 year intervals by Regulatory Guide 1.137 (Ref. 2), paragraph 2.f. This SR is typically performed in conjunction with the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 7), examinations of the tanks. To preclude the introduction of surfactants in the fuel oil system, the cleaning should be accomplished using sodium hypochlorite solutions, or their equivalent, rather than soap or detergents. This SR is for preventive maintenance. The presence of sediment does not necessarily represent a failure of this SR provided that accumulated sediment is removed during performance of the Surveillance.

REFERENCES

1. FSAR, Section [9.5.4].
 2. Regulatory Guide 1.137.
 3. ANSI N195, Appendix B, 1976.
 4. FSAR, Chapter [6].
 5. FSAR, Chapter [15].
 6.

ASTM Standards: D4057-[]; D975-[]; D4176-[];
D975-[]; D1552-[]; D2622-[]; D2276-[].

Insert 5

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 7. ASME, Boiler and Pressure Vessel Code, Section XI.
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