

NRR-PMDAPEm Resource

From: Beltz, Terry
Sent: Wednesday, May 15, 2013 1:47 PM
To: 'Loeffler, Richard A.'
Cc: 'Kissinger, Peter W.'; Waig, Gerald
Subject: FW: Monticello TSTF-501 Review (TAC No. ME9601)
Attachments: Monticello TSTF-501 RAI Response ML13074A810.pdf

Mr. Loeffler:

Please review the NRC staff question listed below associated with their review of the TSTF-501 license amendment request.

Please let me know if NSPM can provide a relatively straightforward response (i.e., either provide a copy of the referenced ASTM Standards to the staff or provide a statement to correct the erroneous references).

Sincerely,

*Terry A. Beltz, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation
(301) 415-3049
Terry.Beltz@nrc.gov*

From: Waig, Gerald
Sent: Wednesday, May 15, 2013 12:47 PM
To: Beltz, Terry
Cc: Wong, Emma; Wolfgang, Robert
Subject: FW: Monticello TSTF-501

Terry,

The licensee's RAI response dated March 12, 2013, includes a supplement to the proposed LAR TS Bases which maintains retention of certain CLB ASTM fuel oil testing standards not identified in RG 1.137, Revision 1. However, the TS Bases references certain ASTM Standards (Reference 5) that the staff cannot confirm to be valid ASTM Standards.

The TS Bases (Reference 5) refers to the following ASTM Standards:

"5. ASTM Standards: 04057-88; D287-92; D445-96; D93-97; 01796-90; D975-91; DI 552-95; D6217-98."

The NRC staff has questions regarding four of the above TS Bases referenced ASTM Standards:

1. D4057-88 – do you mean -81e2?
2. D445-96 – do you mean -97
3. D93-97 – do you mean -94
4. D1796-90 – should be cited as D1796-83(1990)e1

Licensee Action(s)

If the four questionable ASTM Standards are editorial/typographical errors, please provide a statement regarding correction in accordance with the TS Bases Control Program.

If any of the four questionable ASTM Standard are determined to be accurately identified in the TS Bases, please provide a copy of the ASTM Standard.

Gerry

Gerald M. Waig

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Monticello Nuclear Generating Plant
2807 W County Road 75
Monticello, MN 55362

March 12, 2013

L-MT-13-009
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Monticello Nuclear Generating Plant
Docket 50-263
Renewed Facility Operating License No. DPR-22

Response to a Request for Additional Information for License Amendment Request for TSTF-501, Revision 1, Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control (TAC No. ME9601)

- References: 1) NSPM to NRC, "License Amendment Request: Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-501, Revision 1, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control," (L-MT-12-071) dated September 18, 2012. (ADAMS Accession No. ML122630070)
- 2) NRC e-mail to NSPM, "Monticello Nuclear Generating Plant – Draft Request for Additional Information for License Amendment Request re: TSTF-501 (TAC No. ME9601)," dated December 13, 2012.

On September 18, 2012, in accordance with 10 CFR 50.90, the Northern States Power Company – Minnesota (NSPM), doing business as Xcel Energy, Inc., submitted License Amendment Request (LAR) (Reference 1) that proposed changes to the Technical Specifications (TS) for the Monticello Nuclear Generating Plant (MNGP). The proposed changes would revise TS 3.8.3, "Diesel Fuel Oil, Lube Oil and Starting Air," consistent with Technical Specification Task Force (TSTF) Traveler TSTF-501, Revision 1, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control."

On December 13, 2012, the U.S. Nuclear Regulatory Commission (NRC) requested additional information (RAI) from NSPM (Reference 2) to identify the specific revision of Regulatory Guide (RG) 1.137 used to calculate the specific volume of diesel generator fuel oil equivalent to a 7-day and 6-day supply. Enclosure 1 provides the requested information. Enclosure 2 provides a mark-up of the proposed change to the TS Bases specifying the RG 1.137 revision number as requested. The proposed TS Bases changes provided in Enclosure 2 replace in its entirety the proposed TS Bases changes previously submitted in Reference 1, Enclosure 3.

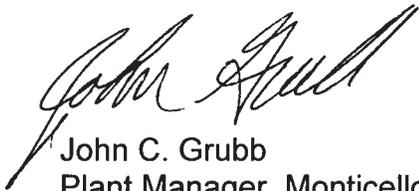
A001
NRC

In accordance with 10 CFR 50.91, a copy of this response, with enclosures, is being provided to the designated Minnesota Official.

Summary of Commitments

This letter proposes no new commitments and does not revise any existing commitments.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on March 12, 2013.



John C. Grubb
Plant Manager, Monticello Nuclear Generating Plant
Northern States Power Company – Minnesota

Enclosures (2)

cc: Administrator, Region III, USNRC
Project Manager, Monticello, USNRC
Resident Inspector, Monticello, USNRC
Minnesota Department of Commerce

ENCLOSURE 1

MONTICELLO NUCLEAR GENERATING PLANT

RESPONSE TO A REQUEST FOR ADDITIONAL INFORMATION

**LICENSE AMENDMENT REQUEST FOR TSTF - 501, REVISION 1, "RELOCATE
STORED FUEL OIL AND LUBE OIL VOLUME VALUES TO LICENSEE CONTROL"**

(2 pages follow)

RESPONSE TO A REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST FOR TSTF - 501, REVISION 1, "RELOCATE STORED FUEL OIL AND LUBE OIL VOLUME VALUES TO LICENSEE CONTROL"

On September 18, 2012, Northern States Power Company – Minnesota submitted a license amendment request (LAR) (Reference 1) proposing a change to Monticello Nuclear Generating Plant (MNGP) Technical Specification (TS) 3.8.3, "Diesel Fuel Oil, Lube Oil and Starting Air." This LAR proposed to adopt Technical Specification Task Force (TSTF) Traveler TSTF-501, Revision 1, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control." On December 13, 2012, the U. S. Nuclear Regulatory Commission (NRC) requested additional information (Reference 2) with respect to the revision of Regulatory Guide (RG) 1.137 used to calculate the specific volume of diesel generator fuel oil.

Request for Additional Information

Please identify the RG 1.137 revision number used to calculate the specific volume of diesel generator fuel oil equivalent to a 7-day and 6-day supply and include the revision number in the proposed TS Bases currently identified as "Reference 2."

If a revision other than RG 1.137, Revision 1, is used, provide justification for this deviation from the TSTF-501 Notice of Availability as published in the Federal Register on May 26, 2010 [75 FR 25988].

Response to Request for Additional Information

The specific volume of Emergency Diesel Generator (EDG) fuel oil equivalent to a 7-day and 6-day supply is calculated using Section 5.4 of ANSI Standard N195 - 1976, "Fuel Oil Systems for Standby Diesel-Generators," and is based on the assumption that the EDG is operated continuously at rated capacity. This methodology is in accordance with Regulatory Guide (RG) 1.137, Revision 1, "Fuel-Oil Systems for Standby Diesel Generators", Regulatory Position C.1.c. The revision number "Revision 1" to Regulatory Guide 1.137 has been added to the proposed TS Bases currently identified as "Reference 2."

The ASTM Standards in place at the time of the conversion from the "custom" TS to the Improved Standard TS were retained with the conversion. As a clarification, the "Background" Section of the TS 3.8.3 Bases concerning the "quality" of the fuel oil has been additionally revised to refer to the American Society for Testing and Materials (ASTM) Standards listed under Reference 5, as discussed in SR 3.8.3.3, since they reflect the later versions of the standards than those discussed in either Revision 0 or Revision 1 of RG 1.137.

Enclosure 2 provides the TS 3.8.3 Bases pages marked up to reflect the statement of the revision number of RG 1.137 and the clarification discussed above.

They replace in its entirety the proposed TS Bases changes previously submitted in Reference 1, Enclosure 3.

REFERENCES

1. NSPM to NRC, "License Amendment Request: Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-501, Revision 1, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control," (L-MT-12-071) dated September 18, 2012. (ADAMS Accession No. ML122630070)
2. NRC e-mail to NSPM, "Monticello Nuclear Generating Plant – Draft Request for Additional Information for License Amendment Request re: TSTF-501 (TAC No. ME9601)," dated December 13, 2012.

ENCLOSURE 2

MONTICELLO NUCLEAR GENERATING PLANT

RESPONSE TO A REQUEST FOR ADDITIONAL INFORMATION

**LICENSE AMENDMENT REQUEST FOR TSTF - 501, REVISION 1, "RELOCATE
STORED FUEL OIL AND LUBE OIL VOLUME VALUES TO LICENSEE CONTROL"**

MARKED-UP TECHNICAL SPECIFICATION BASES PAGES

(10 Pages Follow)

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

BASES

BACKGROUND

The emergency diesel generators (EDGs) are provided with a common storage tank having a fuel oil capacity sufficient to operate one EDG for a period of 7 days while the EDG is supplying full load (2500 kW) as discussed in USAR, Section 8.4.1.1 (Ref. 1). This onsite fuel oil capacity is sufficient to operate the EDGs for longer than the time to replenish the onsite supply from outside sources.

and Regulatory Guide 1.137 (Ref. 2)

Fuel oil is transferred from storage tank to day tanks by either the diesel oil service pump or transfer pump. Redundancy of pumps and piping precludes the failure of one pump, or the rupture of any pipe or valve to result in the loss of more than one EDG. The outside fuel oil storage tank and piping are located underground. The pumps are located in the pump house.

For proper operation of the standby EDGs, it is necessary to ensure the proper quality of the fuel oil. Regulatory Guide 1.137 (Ref. 2) addresses the recommended fuel oil practices as supplemented by ANSI N195 (Ref. 3). The fuel oil properties governed by these SRs are the water and sediment content, API gravity, and impurity level.

and the ASTM Standards provided in Reference 5

The EDG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated EDG under all loading conditions. The system is required to circulate the lube oil to the diesel engine working surfaces and to remove excess heat generated by friction during operation. Each engine oil sump contains an inventory capable of supporting a minimum of 7 days of operation. This supply is sufficient to allow the operator to replenish lube oil from outside sources.

Each EDG includes two independent air start subsystems. Each EDG air start subsystem has adequate capacity with air receiver pressure at ≥ 165 psig for two successive start attempts on the EDG without recharging the air start receivers. Each EDG air start subsystem includes three starting air receivers. The automatic start logic for each EDG will provide a cranking sequence to ensure two start attempts from each subsystem staggered such that there are a total of three start attempts on the EDG. The first attempt will use the selected air start subsystem, the second attempt will use both air start subsystems, while the third attempt will use the air start subsystem that is not selected or not used on the first attempt. The third start attempt may not occur within enough time for the engine to be ready to accept load within 10 seconds of a demand requirement.

BASES

APPLICABLE
SAFETY
ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in USAR, Chapter 14 (Ref. 4), assume Engineered Safety Feature (ESF) systems are OPERABLE. The EDGs 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. These limits are discussed in more detail in the Bases for Section 3.2, Power Distribution Limits; Section 3.5, Emergency Core Cooling Systems (ECCS) and Reactor Core Isolation Cooling (RCIC) System; and Section 3.6, Containment Systems.

Since Diesel Fuel Oil, Lube Oil, and Starting Air supports the operation of the standby AC power sources, it satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

LCO

Stored diesel fuel oil is required to have sufficient supply for 7 days of full load operation for one EDG. It is also required to meet specific standards for quality. Additionally, sufficient lube oil supply must be available to ensure the capability to operate both EDGs at full load for 7 days. This requirement, in conjunction with an ability to obtain replacement supplies within 7 days, supports the availability of EDGs required to shut down the reactor and to maintain it in a safe condition for an anticipated operational occurrence (AOO) or a postulated DBA with loss of offsite power. EDG fuel oil transfer capability from the storage tank to the day tank and from the day tank to the base tank are addressed in LCO 3.8.1, "AC Sources - Operating," and LCO 3.8.2, "AC Sources - Shutdown."

Each starting air subsystem is required to have a minimum capacity for two successive EDG start attempts without recharging the air start receivers.

APPLICABILITY

The AC sources (LCO 3.8.1 and LCO 3.8.2) are required to ensure the availability of the required power to shut down the reactor and maintain it in a safe shutdown condition after an AOO or a postulated DBA. Because stored diesel fuel oil, lube oil, and starting air subsystem support LCO 3.8.1 and LCO 3.8.2, stored diesel fuel oil, lube oil, and starting air are required to be within limits when the associated EDG is required to be OPERABLE.

ACTIONS

The ACTIONS Table is modified by a Note indicating that separate Condition entry is allowed for each EDG. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable EDG subsystem. Complying with the Required Actions for one inoperable EDG subsystem may allow for continued operation, and subsequent inoperable EDG subsystem(s) governed by separate Condition entry and application of associated Required Actions.

*No Changes
For Information*

BASES

ACTIONS (continued)

A.1

In this Condition, the 7 day fuel oil supply for an EDG is not available. However, the Condition is restricted to fuel oil level reductions that maintain at least a 6 day supply. These circumstances may be caused by events such as either:

Insert 1

- a. Full load operation required for an inadvertent start while at minimum required level; or
- b. Feed and bleed operations that may be necessitated by increasing particulate levels or any number of other oil quality degradations.

This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of the fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring both EDGs inoperable. This period is acceptable based on the remaining capacity (> 6 days), the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

In this condition, the 7-day

B.1

i.e.,

Insert 2

is

With lube oil inventory ← 165 gal, sufficient lube oil to support 7 days of continuous EDG operation at full load conditions may not be available. However, the Condition is restricted to lube oil volume reductions that maintain at least a 6 day supply. This restriction allows sufficient time for obtaining the requisite replacement volume. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the EDG inoperable. This period is acceptable based on the remaining capacity (> 6 days), the low rate of usage, the fact that procedures will be initiated to obtain replenishment, and the low probability of an event during this brief period.

C.1

This Condition is entered as a result of a failure to meet the acceptance criterion for particulates. Normally, trending of particulate levels allows sufficient time to correct high particulate levels prior to reaching the limit of acceptability. Poor sample procedures (bottom sampling), contaminated sampling equipment, and errors in laboratory analysis can produce failures that do not follow a trend. Since the presence of particulates does not mean failure of the fuel oil to burn properly in the

Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-501,
Revision 1, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee
Control"

TS Bases 3.8.3 Diesel Fuel Oil, Lube Oil, and Starting Air

Insert 1 (A.1)

The fuel oil level equivalent to a 6-day supply is 33,600 gallons.

Insert 2 (B.1)

The lube oil volume equivalent to a 6-day supply is 142 gallons for each EDG.

BASES

ACTIONS (continued)

diesel engine, since particulate concentration is unlikely to change significantly between Surveillance Frequency intervals, and since proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated EDG inoperable. The 7 day Completion Time allows for further evaluation, resampling, and re-analysis of the EDG fuel oil.

D.1

With the new fuel oil properties defined in the Bases for SR 3.8.3.3 not within the required limits, a period of 30 days is allowed for restoring the stored fuel oil properties. This period provides sufficient time to test the stored fuel oil to determine that the new fuel oil, when mixed with previously stored fuel oil, remains acceptable, or to restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combination of these procedures. Even if a EDG start and load was required during this time interval and the fuel oil properties were outside limits, there is high likelihood that the EDG would still be capable of performing its intended function.

No Changes
For Information

E.1

With starting air receiver pressure < 165 psig in one air starting subsystem, sufficient capacity for three successive EDG start attempts does not exist. However, as long as the other starting air receiver subsystem pressure is \geq 165 psig, there is adequate capacity for two start attempts, and the EDG can be considered OPERABLE while the air receiver pressure is restored to the required limit. A period of 7 days is considered sufficient to complete restoration to the required pressure prior to declaring the EDG inoperable. This period is acceptable based on the remaining air start capacity in the other starting air subsystem, the fact that most EDG starts are accomplished on the first attempt, and the low probability of an event during the 7 day period.

F.1

With starting air receiver pressure < 165 psig in both starting air subsystems, sufficient capacity for three successive EDG start attempts does not exist. However, as long as the receiver pressure is > 125 psig in at least one starting air subsystem, there is adequate capacity for at least one start attempt, and the EDG can be considered OPERABLE while the

BASES

ACTIONS (continued)

air receiver pressure is restored to the required limit. A period of 48 hours is considered sufficient to complete restoration to the required pressure prior to declaring the EDG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most EDG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

G.1

With a Required Action and associated Completion Time not met, or the stored diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than addressed by Conditions A through F, the associated EDG may be incapable of performing its intended function and must be immediately declared inoperable.

SURVEILLANCE
REQUIREMENTS

SR 3.8.3.1

Insert 3

This SR provides verification that there is an adequate inventory of fuel oil in the storage tank to support one EDG's operation for 7 days at full load. The 7 day period is sufficient time to place the unit in a safe shutdown condition and to bring in replenishment fuel from an offsite location.

The 31 day Frequency is adequate to ensure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

Insert 4

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 EDG. ~~The 165-gal requirement~~ is based on the EDG manufacturer's consumption values for the run time of the EDG. Implicit in this SR is the requirement to verify the capability to transfer the lube oil from its storage location to the EDG, if the EDG 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 EDG starts and run time are closely monitored by the plant staff.

Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-501, Revision 1, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control"

Insert 3 (SR 3.8.3.1)

The fuel oil level equivalent to a 7 day supply is 38,300 gallons when calculated in accordance with RG 1.137 (Ref. 2) and ANSI N195 (Ref. 3). The required fuel storage volume is determined using the most limiting energy content of the stored fuel that meets the plant design basis requirements. Using the most limiting energy content as verified by direct energy content measurement or the known correlation of diesel fuel oil absolute specific gravity or API gravity to energy content, the required diesel generator output, and the corresponding fuel consumption rate, the onsite fuel storage volume required for 7 days of operation can be determined. SR 3.8.3.3 requires that new and stored fuel oil properties are verified and maintained within the limits of the Diesel Fuel Oil Testing Program.

Insert 4 (SR 3.8.3.2)

The lube oil volume equivalent to a 7-day supply is 165 gallons and

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.3.3

The tests of new fuel oil prior to addition to the storage tank 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 tank. These tests are to be conducted prior to adding the new fuel that is in the diesel oil receiving tank to the storage tank. The tests, limits, and applicable ASTM Standards are as follows:

- a. Sample the new fuel oil:
- 1) in accordance with ASTM D4057-88 (Ref. 5); or
 - 2) by recirculating fuel oil to avoid tank stratification and allowing a single point representative sample;
- b. Verify that the new fuel oil sample has: (1) an API gravity at 60°F of ≥ 28 and ≤ 38 when tested in accordance with ASTM D287-92 (Ref. 5); (2) a saybolt viscosity at 100°F of ≥ 32.6 and ≤ 40.1 seconds universal when tested in accordance with ASTM D445-96 (Ref. 5); and (3) a flash point of $\geq 125^\circ\text{F}$ when tested in accordance with ASTM D93-97 (Ref. 5); and
- c. Verify water and sediment content within limits when tested in accordance with ASTM D1796-90 (Ref. 5).

No Changes
For Information

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.

Following the initial analysis of the new fuel oil sample, further analysis is completed prior to or within 31 days following addition of the new fuel oil to the fuel oil storage tank to establish that the other properties specified in Table 1 of ASTM D975-91 (Ref. 5) are met for new fuel oil when tested in accordance with ASTM D975-91 (Ref. 5), except that the analysis for sulfur may be performed in accordance with ASTM D1552-95 (Ref. 5). 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 EDG operation. This Surveillance ensures the availability of high quality fuel oil for the EDGs.

Fuel oil degradation during long term storage shows up as an increase in particulate, mostly due to oxidation. The presence of particulate does not

BASES

SURVEILLANCE REQUIREMENTS (continued)

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 should be determined in accordance with ASTM D6217-98 (Ref. 5). 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.

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 EDG is available. The system design requirements provide for a minimum of three engine start cycles without recharging. A start cycle is up to three seconds of cranking. The pressure specified in this SR is intended to reflect the lowest value at which the three 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 EDG operation. Water may come from any of several sources, including condensation, ground water, rain water, 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

No Changes
For Information

BASES

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.

REFERENCES

1. USAR, Section 8.4.1.1
 2. Regulatory Guide 1.137. *A, Revision 1*
 3. ANSI N195, 1976.
 4. USAR, Chapter 14.
 5. ASTM Standards: D4057-88; D287-92; D445-96; D93-97; D1796-90; D975-91; D1552-95; D6217-98.
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