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OPPD
Omaha Public Power District

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December 1, 2003
LIC-03-0077

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

Reference: 1) Docket No. 50-285
2) Regulatory Guide 1.137, Fuel-Oil Systems for Standby Diesel Generators, Revision 1, October 1979

SUBJECT: Fort Calhoun Station Unit No. 1 License Amendment Request, "Addition of Diesel Generator Fuel Oil, Diesel Generator Lubricating Oil, and Diesel Generator Starting Air Requirements"

Pursuant to 10 CFR 50.90, Omaha Public Power District (OPPD) hereby requests the following amendment to Fort Calhoun Station (FCS) Technical Specification (TS) 2.7, "Electrical Systems," TS Table 3-5, "Minimum Frequencies for Equipment Tests," and TS 5.0, "Administrative Controls." This proposed amendment modifies the requirements for Diesel Generator (DG) Fuel Oil for consistency with the Improved Standard Technical Specifications (ISTS) and adds requirements for DG Lubricating Oil, and DG Starting Air. The proposed changes will assure that required quality and quantity of DG Fuel Oil is maintained and also will assure that sufficient DG Lubricating Oil and DG Starting Air is maintained. This proposed amendment imposes limits on DG support system parameters to ensure the DGs will be able to perform their design function. This proposed amendment also brings the current TS on DG Fuel Oil into alignment with the ISTS. This amendment is modeled after the ISTS, Section 3.8.3.

This amendment also incorporates into the FCS TS improvements to ISTS Sections 3.8.3 and 5.5 consistent with those provided in Technical Specification Task Force (TSTF) travelers TSTF-254, Rev. 2 and TSTF-374, Rev. 0.

FCS also requests approval of reduction in commitments with respect to the FCS Quality Assurance (QA) Program associated with this License Amendment Request. This License Amendment Request adds a Surveillance [Table 3-5, Item 9c] stating that the DG Fuel Oil Properties are required to be verified within limits in accordance with the Diesel Fuel Oil Testing Program. 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. FCS conservatively considers that analysis of DG Fuel Oil 31 days following the initial fuel oil sample constitutes a reduction in commitment with respect to the FCS QA Program, since the guidance of Reference 2 specifies a 2 week period in which to complete the remaining tests. 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 activity is

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controlled by 10 CFR 50 Appendix B, Section XI and therefore there is no negative impact on the effectiveness of the overall FCS QA Program by the incorporation of this change.

Per 10 CFR 50.54(a)(4), changes to the QA Program description that reduce commitments must be submitted to the NRC and receive NRC approval prior to implementation. OPPD concludes that this revision to the FCS QA Program continues to satisfy the criteria of 10 CFR 50, Appendix B and the QA Program description commitments previously accepted by the NRC, since this change is consistent with the ISTS and DG Fuel Oil continues to be tested for quality. Required DG Fuel Oil testing is implemented in the FCS QA Plan; therefore, no pages of the FCS QA Program are affected.

Attachment 1 provides the No Significant Hazards Evaluation and the technical bases for this requested change to the TS. Attachment 2 contains a marked-up version reflecting the requested TS and Basis changes. Attachment 3 contains a clean version reflecting the proposed TS and Basis.

OPPD requests approval of the proposed amendment by August 31, 2004. Once approved, the amendment shall be implemented within 120 days. No commitments are made to the NRC in this letter.

I declare under penalty of perjury that the foregoing is true and correct. (Executed on November 25, 2003)

If you have any questions or require additional information, please contact Dr. R. L. Jaworski at (402) 533-6833.

Sincerely,

R. T. Ridenoure
Vice President

RTR/RRL/trb

Attachments:
1. Fort Calhoun Station's Evaluation
2. Markup of Technical Specification Pages
3. Proposed Technical Specification Pages

c: B. S. Mallett, NRC Regional Administrator, Region IV
A. B. Wang, NRC Project Manager
J. G. Kramer, NRC Senior Resident Inspector
Division Administrator - Public Health Assurance, State of Nebraska

ATTACHMENT 1

Fort Calhoun Station's Evaluation for Amendment of Operating License

Fort Calhoun Station's Evaluation for Amendment of Operating License

1.0 INTRODUCTION

This letter is a request to amend Operating License DPR-40 for Fort Calhoun Station (FCS) Unit No. 1.

The proposed change will revise Technical Specification (TS) 2.7, "Electrical Systems," TS Table 3-5, "Minimum Frequencies for Equipment Tests," and TS 5.0, "Administrative Controls." This proposed amendment modifies the requirements for Diesel Generator (DG) Fuel Oil for consistency with the Improved Standard Technical Specifications (ISTS) and adds requirements for DG Lubricating Oil, and DG Starting Air. The proposed changes will assure that the required quality and quantity of DG Fuel Oil is maintained and also will assure that sufficient DG Lubricating Oil and DG Starting Air is maintained. This proposed amendment imposes limits on DG support system parameters to ensure the DGs will be able to perform their design function. This proposed amendment also brings the current TS on DG Fuel Oil into alignment with the ISTS. This amendment is modeled after the ISTS.

This amendment also incorporates into the FCS TS improvements to ISTS Sections 3.8.3 and 5.5 consistent with those provided in Technical Specification Task Force (TSTF) travelers TSTF-254, Rev. 2 and TSTF-374, Rev. 0.

2.0 DESCRIPTION OF PROPOSED AMENDMENT

The proposed changes to TS Section 2.7 will add requirements for DG Lubricating Oil and DG Starting Air and their associated actions. Also, actions are added for DG Fuel Oil properties. The proposed changes to TS Table 3-5 add surveillance requirements for DG Fuel Oil properties, Fuel Oil Storage Tank accumulated water, DG Lubricating Oil and DG Starting Air. The Surveillance interval for DG Fuel Oil supply is being changed from daily to monthly. A requirement for a "Diesel Fuel Oil Testing Program" is being added to TS 5.0 as TS 5.22. The proposed changes will assure that required quality and quantity of DG Fuel Oil is maintained and also will assure that sufficient DG Lubricating Oil and DG Starting Air is maintained. Appropriate TS Bases updates are also being performed.

With regards to TSTF-254, Rev. 2, the proposed change updates the Surveillance interval for the added Surveillance to check for and remove accumulated water from the EDG fuel oil day tanks, base tanks, and underground storage tanks. The Surveillance interval is proposed to be decreased from once every 31 days to once every 92 days. The respective Bases are also modified to support this change.

With regards to TSTF-374, Rev. 0, the proposed change revises the proposed TS 5.22, Diesel Fuel Oil Testing Program," to relocate the specific ASTM standard references from the Administrative Controls section of the TS to a licensee-controlled document. In addition to the "clear and bright" test used to establish acceptability of new fuel oil for use prior to addition to storage tanks, an option to allow an alternate water and sediment content test to be performed to establish the acceptability of new fuel oil has been added. The TS Bases are also revised to provide the current ASTM standards.

3.0 BACKGROUND

The proposed changes to TS Section 2.7 add requirements for DG Lubricating Oil and DG Starting Air and their associated actions. Also, actions are added for DG Fuel Oil properties. The proposed changes to TS Table 3-5 add surveillance requirements for DG Fuel Oil properties, Fuel Oil Storage Tank accumulated water, DG Lubricating Oil and DG Starting Air. The Surveillance interval for DG Fuel Oil supply is being changed from daily to monthly. A requirement for a "Diesel Fuel Oil Testing Program" is being added to TS 5.0 as TS 5.22. The proposed changes will assure that required quality and quantity of DG Fuel Oil is maintained and also will assure that sufficient DG Lubricating Oil and DG Starting Air is maintained. The DGs are designed to provide sufficient capacity, capability, redundancy, and reliability to ensure the availability of necessary power to Engineered Safety Feature (ESF) systems so that fuel, Reactor Coolant System and containment design limits are not exceeded. Since DG Fuel Oil, DG Lubricating Oil, and the DG Starting Air subsystems support the operation of the standby AC power sources, they satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii) and should be included in the TS.

With regards to TSTF-254, Rev. 2, the proposed change updates the Surveillance interval for the added Surveillance to check for and remove accumulated water from the EDG fuel oil day tanks, base tanks, and underground storage tanks. The Surveillance interval is proposed to be decreased from once every 31 days to once every 92 days. This change is intended to limit costs and resources associated with fuel oil sampling requirements while maintaining a high confidence that the quality of the fuel oil will remain superior.

The DG fuel oil storage and transfer system consists of two underground storage tanks, and a day tank and base tank for each EDG. The tanks, associated piping, and

transfer pumps are Seismic Class 1 components. The required volumes of both tanks ensure a minimum of 7 days of DG operation at full load. The underground storage tanks may be replenished directly from fuel oil transported to the site. Transfer pumps take suction from the underground storage tanks to maintain required level in the associated DG fuel oil day tank.

The requirement to check for and remove accumulated water from the DG fuel oil storage tanks, base tanks, and day tanks is intended to ensure high quality fuel remains available at all times in support of EDG operation. Moisture intrusion into the fuel oil systems establishes a water environment where the growth of bacteria is enhanced. Such growth may eventually result in microbiological fouling within the fuel oil system and degraded flow and fuel oil quality to support DG operations. DGs may also be adversely affected by water being mixed with the fuel oil during periods when the DG is in operation. Therefore, satisfactory performance of the aforementioned moisture intrusion checks of the fuel oil system minimizes the likelihood that fouling or other adverse affects caused by the presence of water in the fuel oil will result.

The presence of water in the fuel oil storage tanks, base tanks, or day tanks may come from any of several sources, depending of plant specific design and physical conditions. These sources may include condensation, ground water, rain water, contaminated fuel oil, and from breakdown of the fuel oil by bacteria. However, the presence of water does not necessarily indicate that a significant detrimental impact on DG operation will result. As a preventative measure, therefore, a check is made to determine if water exists within the fuel oil tanks and action taken to remove water when found to be present. The current interval between checks is 31 days as recommended in Regulatory Guide (RG) 1.137 (Ref. 10.3).

With regards to TSTF-374, Rev. 0, the proposed changes revise TS 5.22 to relocate the 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 5.22.a.3) has been expanded to allow a water and sediment content test to be performed to establish the acceptability of new fuel oil. TS Bases Section 3.2 is also revised to provide the current ASTM standards.

The proposed changes to TS 5.22 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 5.22.c or a newer edition of the ASTM Standard is not permitted without an amendment Reference 1, previously relocated all

references to ASTM Standards in TS to licensee-controlled documents, with the exception of ISTS 5.5.13.c.

TS 5.22.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 5.22.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.

4.0 REGULATORY REQUIREMENTS & GUIDANCE

The changes to TS Section 2.7, TS Table 3-5 and TS 5.0 satisfies FCS Design Criterion 24, *Emergency Power for Protection Systems*, and FCS Design Criterion 39, *Emergency Power for Engineered Safety Features* which are similar to 10 CFR 50, Appendix A, General Design Criteria (GDC) 17, *Electric power systems*. FCS was issued a construction permit prior to May 21, 1971, and therefore the GDC is based upon the plant-specific design criterion documented in Appendix G of the FCS Updated Safety Analysis Report (Reference 10.4). These changes will ensure that proper limiting conditions for operation are entered for equipment or functional inoperability.

5.0 TECHNICAL ANALYSIS

The proposed changes to TS Section 2.7, TS Table 3-5 and TS 5.0 will assure operability of the DGs by imposing limits on DG Fuel Oil, DG Lubricating Oil, and

DG starting Air. These changes will assure that the required quality and quantity of DG Fuel Oil are maintained and also will assure that sufficient DG Lubricating Oil DG and Starting Air is maintained. The proposed change will assure that FCS continues to satisfy FCS Design Criterion 24, *Emergency Power for Protection Systems*, and FCS Design Criterion 39, *Emergency Power for Engineered Safety Features*. These proposed changes have no affect upon design basis.

6.0 REGULATORY ANALYSIS

The present TS contain no provisions for DG Lubricating Oil and DG Starting Air. The proposed changes to TS will clarify the scope, allowed outage times, and actions required for DG Lubricating Oil and DG Starting Air. The changes will assure that the required quality and quantity of DG Fuel Oil is maintained and also will assure that sufficient DG Lubricating Oil and DG Starting Air is maintained. These proposed changes have no affect upon design basis. The proposed clarification of the specifications and basis are consistent with those established in ISTS (References 10.1 and 10.2).

The following changes are proposed:

1. A new Limiting Condition for Operation (LCO), [2.7(1)n], stating, "Lubricating oil inventory is $\geq$ 500 gallons," is being added. This proposed change will assure that a 7 day supply of DG Lubricating Oil is maintained. The onsite storage in addition to the engine oil sump is sufficient to ensure 7 days of continuous operation. This is considered an acceptable change as this is a new and more restrictive requirement than presently contained in the FCS Technical Specifications. This change is consistent with ISTS 3.8.3.

2. A new LCO, [2.7(1)o], stating, "Each required starting air receiver bank pressure is $\geq$ 190 psig," is being added. This proposed change will assure that sufficient starting air for 5 successive DG start attempts without recharging the air receivers. This change is consistent with ISTS 3.8.3.

3. A new LCO [2.7(3)] has been created to address actions to restore DG Fuel Oil, DG Lubricating Oil and DG Starting Air. This LCO allows the minimum requirements for DG Fuel Oil, DG Lubricating Oil and DG Starting Air to be modified to the extent that any of the listed conditions will be allowed after the reactor coolant has been heated above 300°F. Additionally, LCO 2.7(1)k concerning required volumes of DG Fuel Oil has been moved to LCO 2.7(3)a for consistency with NUREG-1432

(Reference 10.1) and LCO 2.3(2). This change is consistent with ISTS 3.8.3.

4. A new LCO [2.7(3)b] stating, "If one or more diesel generators has lube oil inventory < 500 gallons and > 450 gallons, then restore the lube oil inventory to within limits within 48 hours," is being added. In this Condition, the 7 day lube oil supply for a DG is not available. However, the Condition is restricted to lube oil level reductions that maintain at least a 6 day supply. These circumstances may be caused by events such as full load operation required after an inadvertent start while at minimum required level; or feed and bleed operations, which 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. A period of 48 hours is considered sufficient to complete restoration of the required level prior to declaring the DG 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. This change is consistent with ISTS 3.8.3.

5. A new LCO [2.7(3)c] stating, "If the total particulates of fuel oil stored in FO-1 or FO-10 is not within limits, then restore fuel oil total particulates to within limits within 7 days," is being added. TS 2.7(3)c is entered as a result of a failure to meet the DG Fuel Oil acceptance criteria. 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 diesel engine, and particulate concentration is unlikely to change significantly between Surveillance intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, re-sampling, and re-analysis of the DG fuel oil.

6. A new LCO [2.7(3)d] stating, "If the properties of new fuel oil stored in FO-1 or FO-10 is not within limits, then restore stored fuel oil properties to within limits within 30 days," is being added. With the new fuel oil properties defined in the Bases 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 restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

7. A new LCO [2.7(3)e] stating, "If one or more diesel generators has the required starting air receiver with pressure < 190 psig and > 150 psig, then restore starting air receiver pressure to > 190 psig within 48 hours," is being added. Each DG has two starting air subsystems (primary and secondary), each with adequate capacity for five successive start attempts of the DG without recharging the air start receiver(s). Either subsystem can fulfill the function of starting the DG, however the requirements of TS 3.7(1)a.i must be met for the required starting air subsystem. With starting air receiver pressure < 190 psig, sufficient capacity for five successive DG start attempts does not exist. However, as long as the receiver pressure is > 150 psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the 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 DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

8. A new LCO [2.7(3)f] stating, "If the Required Action and associated Completion Time of a, b, c, d, or, e is not met for one or more diesel generators has diesel fuel oil, lube oil, or starting air subsystem not within limits for reasons other than a, b, c, d, or e, then declare the associated DG inoperable immediately," is being added. In this case, the associated DG may be incapable of performing its intended function, must be immediately declared inoperable.

9. The Surveillance interval the of Diesel Fuel Supply Surveillance [Table 3-5, Item 9 (changed to 9a)] is being changed from daily to monthly. This Surveillance provides verification that there is an adequate inventory of fuel oil in the storage tanks to support each DG'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 Surveillance interval is adequate to ensure that a sufficient supply of fuel oil is available, since unit operators would be aware of any large uses of fuel oil during this period.

10. A Surveillance [Table 3-5, Item 9b] stating that the Diesel Lubricating Oil Inventory is required to be verified within limits on a monthly Surveillance interval is being added. 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 gallon requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this SR is the requirement to assure the capability to transfer the lube oil from its storage location to the DG, since 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 Surveillance interval 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.

11. A Surveillance [Table 3-5, Item 9c] stating that the Diesel Fuel Oil Properties are required to be verified within limits in accordance with the Diesel Fuel Oil Testing Program is being added. Tests are performed as 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 Surveillance interval of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Surveillance intervals.

12. A Surveillance [Table 3-5, Item 9d] stating that the Diesel Generator Air Start Receiver Pressure is required to be verified within limits on a monthly Surveillance interval is being added. 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 as the cranking time required to accelerate the DG to firing 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 Surveillance interval 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.

13. A Surveillance [Table 3-5, Item 9d] to check for and remove accumulated water from each Fuel Oil Storage Tank on a 31 day Surveillance interval is being added. 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 Regulatory Guide 1.137. This Surveillance is for preventative maintenance. The presence of water does not necessarily represent failure of this Surveillance provided the accumulated water is removed during performance of the Surveillance.

    With regards to TSTF-254, Rev. 2, the proposed change is intended to decrease the specified Surveillance interval for sampling DG fuel oil for water content from 31 days to 92 days. Justification of this change is dependent on plant-specific experience, in-place programs, and the physical and design characteristics of the fuel oil systems, which must illustrate that the proposed Surveillance interval change will not result in a significant impact on DG operability.

    As described in the previous section, several possibilities exist regarding water intrusion into the fuel oil system. Many plants contain the underground storage tanks and piping within flood resistant vaults and pipe runs to protect the piping and tanks from direct contact with ground water sources or rain. If storage tanks are not contained within such a vault, the static head of the fuel oil is sufficient to significantly minimize, if not eliminate, water intrusion into the system from underground sources. Condensation within the tanks is the most likely source of moisture development, but its significance is offset by the short time periods between sampling intervals. Other TS fuel oil sampling requirements exist to help ensure that fuel oil purity is maintained, thus minimizing the impact of water formation from the breakdown of the fuel oil by bacteria. This leaves the possibility of water intrusion into the fuel oil from makeup sources such as from fuel oil supplied by offsite vendors.

The ISTS require a Diesel Fuel Oil Testing Program (being added in this license amendment request as TS 5.22). This program is intended to ensure that fuel oil is sampled and analyzed as a preventative measure against DG degradation, including any moisture intrusion into the DG fuel oil injection ports when the DG is running. Because the density of water is greater than that of the fuel oil, water contained within the system will migrate to the low point of the system (bottom of the tank). Fuel oil trucks brought onsite by vendors to replenish site fuel oil supplies are likewise sampled for water content prior to transferring the contents to any fuel oil storage tank. If water is detected, the fuel oil is not permitted to be transferred to the onsite tanks unless the problem can be resolved.

In summary, fuel oil sampling programs have historically provided ample protection against the undetected presence of water in the fuel oil systems required for DG operations. In addition, it is historically uncommon for any significant quantity of water to be detected in the TS-required underground storage tanks, base tanks, or fuel oil day tanks. If an unexpected amount of water is detected, an evaluation is performed in an attempt to locate the source of the water ingress and/or restore the system to normal operational status. This often includes administratively increasing the sample frequency until evidence of restoration is established (as is one intent of the Maintenance Rule under 10 CFR 50.65(a)(3)), even if TS limits have not yet been exceeded.

Also of significance is that the required sampling for water intrusion into the DG fuel oil system is a preventative measure intended to enhance the likelihood that future DG operation will not be prevented. In other words, the presence of small amounts of moisture in the fuel oil is not expected to present a noticeable degradation in DG performance. The sampling requirements or presence of moisture in the fuel oil system is also not considered in the safety analysis. Finally, the DG-required underground fuel oil tanks are flushed through filtering agents and sampled for overall purity at routine frequencies. Based on the protective measures established through onsite diesel fuel oil testing programs to detect moisture in fuel oil before it is added to TS-required fuel oil tanks, the low likelihood that significant moisture buildup will occur over short periods of time due to physical and design characteristics of the fuel oil systems, and that the presence of moisture within the fuel oil does not necessarily equate to significant DG degradation, extending the Surveillance interval for sampling the water content of the DG fuel oil storage tanks, base tanks, and day tanks from 31 days to 92 days is acceptable.

14. TS 5.22, Diesel Fuel Oil Testing Program, is being added. Technical Specification 5.22 covers both new and stored fuel oil and requires testing in accordance with applicable ASTM Standards. FCS has a Diesel Fuel Oil testing program which ensures proper fuel oil quality. This program includes purchasing, receipt testing of new fuel oil, and periodic analyses of the stored fuel oil. FCS is not committed to the fuel analysis portion of Regulatory Guide 1.137 or ANSI N195-1976; however, these standards were utilized as guidance in the development of the Diesel Fuel Oil testing program.

    With regards to TSTF-374, Rev. 0, the proposed changes revise TS 5.22 from ISTS 5.5.13 as follows.

    - ISTS 5.5.13.a.3 states, "a clear and bright appearance with proper color;"

      TS 5.22.a.3 has been revised to state, "a clear and bright appearance with proper color or a water and sediment content within limits;"

    - ISTS 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 5.22.c has been revised to state, "Total particulate concentration of the fuel oil is < 10 mg/l when tested every 31 days."

    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 5.22 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 5.22 to a licensee-controlled document will not affect the fuel oil properties, the OPERABILITY of the DGs will be maintained. TS 3.2 Table 3-5 requires fuel oil testing to be performed in accordance with the Diesel Fuel Oil Testing Program and TS 5.22 provides the programmatic requirements for fuel oil testing. The proposed changes relocate the specific ASTM Standard references from TS 5.22 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 D2709-96 or ASTM D1796-83 are the same ASTM Standards used to verify the water and sediment content is within limits 31 days following sampling and addition to the storage tanks as required by TS 5.22.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 TS 3.2 are revised to include the option of water and sediment content.

TS 3.2, Table 3-5, Item 9c requires fuel oil testing to be performed in accordance with the Diesel Fuel Oil Testing Program, and TS 5.22 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 5.22 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 TS 3.2 are clarified to indicate that the API gravity is tested in accordance with ASTM D287-82 since ASTM D975 does not specifically address API gravity testing.

The Bases for TS 3.2 are revised to change ASTM D2276 to ASTM 6217. ASTM 6217 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.

15. The Bases for these TS are also being changed/augmented to be consistent with ISTS. These changes replace the existing basis associated with this specification with a basis similar in format and content of the ISTS. These changes are being made, primarily, to help explain the new ISTS format and provide the operator with a better understanding of the limits, allowed outage time, completion time, and reason for the specifications. These proposed changes have no affect upon design basis. The proposed clarification of the basis is consistent with those established in the ISTS (Reference 10.1 and 10.2).

    Additionally, the proposed Bases for TS 3.2 specify that total particulate concentration of the fuel oil is $\leq$ 10 mg/l when tested every 31 days in accordance with ASTM 6217-98, with the exception that the filters specified in the ASTM method may have a nominal pore size of up to 3 microns. This variation from the ISTS regarding filter pore size is being incorporated since the FCS inline filters on the DGs are not designed to trap particulates less than 3 microns in size, as passage of such particulates through the fuel injectors has not been known to cause any degradation of engine performance.

    With regards to TSTF-374, Rev. 0, the proposed changes also revise Bases for Section 3.2 to reference the current specific ASTM Standards. Appropriate Bases changes are also being made consistent with TSTF-254, Rev. 2.

7.0 NO SIGNIFICANT HAZARDS CONSIDERATION

Omaha Public Power District has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

   Response: No.

   The proposed change will revise Technical Specification (TS) 2.7, "Electrical Systems," TS Table 3-5, "Minimum Frequencies for Equipment Tests," and TS 5.0, "Administrative Controls." This proposed amendment modifies the requirements for Diesel Generator (DG) Fuel Oil for consistency with the Improved Standard Technical Specifications (ISTS) and adds requirements for DG Lubricating Oil, and DG Starting Air. The Surveillance interval of Diesel Fuel Supply Surveillance [Table 3-5, Item 9 (changed to 9a)] is being changed from daily to monthly. The 31 day Surveillance interval 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. Therefore, this change does not significantly increase the probability of a previously analyzed accident. Further, an increase of the Surveillance interval will not affect the capability of the component or system to perform its function. Therefore, this change does not significantly increase the consequences of a previously analyzed accident. All other changes are more restrictive changes. The changes will ensure that proper Limiting Conditions for Operation are entered for equipment or functional inoperability. There are no physical alterations being made to the DGs or related systems.

   With regards to TSTF-254, Rev. 2, the proposed change does not require any physical change to any plant systems, structures, or components nor does it require any change in systems or plant operations. The proposed change does not require any change in safety analysis methods or results. The water content of the DG fuel oil system is not considered an accident initiator. The change to reduce the fuel oil sampling frequency for water content from 31 days to 92 days does not present a significant impact to DG operability or significantly degrade DG performance and, therefore, does not present a significant detrimental impact on structures, systems, or components that support accident recovery.

   With regards to TSTF-374, Rev. 0, the proposed changes relocate the specific ASTM Standard references from the Administrative Controls Section of 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 for TS 3.2 to reference the current specific ASTM Standards. The Bases for TS 3.2 are revised to indicate that the API gravity is tested in accordance with ASTM D287.

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

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

Response: No.

The proposed changes will not result in any physical alterations to the DGs, any plant configuration, systems, equipment, or operational characteristics. There will be no changes in operating modes, or safety limits, or instrument

limits. With the proposed changes in place, Technical Specifications will retain requirements for the DGs.

With regards to TSTF-254, Rev. 2, the accident analyses do not consider the water content of the EDG fuel oil systems. Failure of a DG to start and load upon accident initiation is considered in the accident analyses, but is not affected by the proposed change to the fuel oil sampling Surveillance intervals. The existing analyses remain unchanged and the proposed TS change does not affect any accident initiators that would create a new accident.

With regards to TSTF-374, Rev. 0, the proposed changes relocate the specific ASTM Standard references from the Administrative Controls Section of the 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 also revise the Bases of TS 3.2 to reference the current specific ASTM Standards. The Bases for TS 3.2 is revised to indicate that the API gravity is tested in accordance with ASTM D287.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No.

The proposed changes clarify the regulatory requirements for the DGs. The Completion Times and Frequencies established are within those invoked by the present Technical Specifications or equal to those previously reviewed and approved for use by the NRC. The proposed changes will not alter any physical or operational characteristics of the DGs and associated systems and equipment.

With regards to TSTF-254, Rev. 2, the proposed change does not require any change in accident analysis methods or results. The safety margin as established in the current license basis remains unchanged. Reducing the Surveillance interval for DG fuel oil sampling does not, in itself, result in a measurable impact on the operability of the DGs. The water content of the DG fuel oil systems will continue to be assessed and corrective action taken should any condition adverse to DG operability be detected.

With regards to TSTF-374, Rev. 0, The proposed changes relocate the specific ASTM Standard references from the Administrative Controls Section of THE 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 the Bases for TS 3.2 to reference the current specific ASTM Standards. The Bases for TS 3.2 is revised to indicate that the API gravity is tested in accordance with ASTM D287. 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.

Therefore, the proposed changes do not involve a reduction in a margin of safety.

Based on the above, Omaha Public Power District concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

8.0 ENVIRONMENTAL CONSIDERATION

Based on the above considerations, the proposed amendment does not involve and will not result in a condition which significantly alters the impact of Fort Calhoun Station on the environment. Thus, the proposed changes meet the eligibility criteria

for categorical exclusion set forth in 10 CFR Part 51.22(c)(9), and, pursuant to 10 CFR Part 51.22(b), no environmental assessment need be prepared.

9.0 PRECEDENCE

The proposed Technical Specifications are patterned after the Improved Standard Technical Specifications as described in NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants," Reference 10.1. The NRC has approved specifications very similar to these proposed changes for Palisades Nuclear Power Plant (ML993510369) and Calvert Cliffs Unit 1 and 2 (ML010520026). The only significant difference in these specifications and ISTS is that these proposed specifications are not in the ISTS recommended "tabular" format. This proposed amendment includes the limits as provided in the Improved Standard Technical Specifications. These proposed specifications are also similar to Standard Technical Specifications as described in NUREG-0212, "Standard Technical Specifications for Combustion Engineering Plants," Reference 10.2.

The exception in TS 5.22, Diesel Fuel Oil Testing Program regarding required filter pore size for measuring DG Fuel Oil particulate concentration has been previously approved for Peach Bottom Atomic Power Station Units 2 and 3 respectively in Amendments 131 and 134 (ML011380090).

The information in TSTF-254, Rev. 2 has been not been previously approved for any plant.

Information similar to that in TSTF-374, Rev. 0 has been approved for V. C. Summer Station in Amendment 121 dated November 29, 1994 (ML012280399). The information in TSTF-374 has been requested by Byron and Braidwood in a request for license amendment dated June 13, 2001 (ML011650363) and by Catawba and McGuire in a request for license amendment dated August 26, 2002 (ML022490020).

10.0 REFERENCES

10.1 NUREG-1432, "Standard Technical Specifications, Combustion Engineering Plants"
10.2 NUREG-0212, Revision 2, "Standard Technical Specifications for Combustion Engineering Pressurized Water Reactors"
10.3 Regulatory Guide 1.137, Fuel-Oil Systems for Standby Diesel Generators, Rev. 1
10.4 FCS USAR Appendix G

ATTACHMENT 2

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2.0 LIMITING CONDITIONS FOR OPERATION
2.7 Electrical Systems

Applicability

Applies to the availability of electrical power for the operation of plant components.

Objective

To define those conditions of electrical power availability necessary to provide for safe reactor operation and the continuing availability of engineered safety features.

Specifications

(1) Minimum Requirements

The reactor shall not be heated up or maintained at temperatures above 300°F unless the following electrical systems are operable:

a. Unit auxiliary power transformers TIA-1 or -2 (4,160 V).

b. House service transformers TIA-3 and 4 (4,160 V).

c. 4,160 V engineered safety feature buses 1A3 and 1A4.

d. 4,160 V/480 V Transformers TIB-3A, TIB-3B, TIB-3C, TIB-4A, TIB-4B, TIB-4C.

e. 480 V distribution buses 1B3A, 1B3A-4A, 1B4A, 1B3B, 1B3B-4B, 1B4B, 1B3C, 1B3C-4C, 1B4C.

f. MCC No. 3A1, 3B1, 3A2, 3C1, 3C2, 4A1, 4A2, 4C1 and 4C2.

g. 125 V d-c buses No. 1 and 2 (Panels EE-8F and EE-8G).

h. 125 V d-c distribution panels AI-41A and AI-41B.

i. 120V a-c instrument buses A, B, C, and D (Panels AI-40-A, B, C and D).

j. Inverters A, B, C, and D.

k. Station batteries No. 1 and 2 (EE-8A and EE-8B) including one battery charger on each 125V d-c bus No. 1 and 2 (EE-8F and EE-8G).

l. Two emergency diesel generators (DG-1 and DG-2).

m. One diesel fuel oil storage system containing a minimum volume of 16,000 gallons of diesel fuel in FO-1, and a minimum volume of 10,000 gallons of diesel fuel in FO-10.

n. Lubricating oil inventory for each DG is ≥ 500 gallons.

o. Each required starting air receiver bank pressure is ≥ 190 psig.

2.0 LIMITING CONDITIONS FOR OPERATION

2.7 Electrical Systems (Continued)

d. Either one of the 4.16kV engineered safeguards buses, 1A3 or 1A4 may be inoperable for up to 8 hours provided the operability of the diesel generator associated with the operable bus is demonstrated immediately and there are no inoperable required engineered safeguards components associated with the operable bus.

e. One of each group of 4160 V/480 V Transformers (T1B-3A or 4A), (T1B-3B or 4B), and (T1B-3C or 4C) may be inoperable for up to 8 hours provided there are no inoperable required engineered safeguards components which are redundant to components on the inoperable transformer.

f. One of the 480 V distribution buses connected to bus 1A3 or connected to bus 1A4 may be inoperable for up to 8 hours provided there are no inoperable required safeguards components which are redundant to components on the inoperable bus.

g. Either Group of MCC No.'s (3A1, 3B1, 3A2, 3C1, 3C2,) or (4A1, 4A2, 4C1, 4C2) may be inoperable for up to 8 hours provided there are no inoperable required safeguards components which are redundant to components on the inoperable MCC. MCC 3C1 may be inoperable in excess of 8 hours if battery chargers No. 1 and No. 2 are operable.

h. One of the four 120V a-c instrument buses (A, B, C or D) may be inoperable for 8 hours provided the reactor protective and engineered safeguards systems instrument channels supplied by the remaining three buses are all operable.

i. Two battery chargers may be inoperable for up to 8 hours provided battery charger No. 1 (EE-8C) or No. 2 (EE-8D) is operable.

j. Either one of the emergency diesel generators (DG-1 or DG-2) may be inoperable for up to seven days (total for both) during any month, provided there are no inoperable required engineered safeguards components associated with the operable diesel generator. If one diesel generator is inoperable, within 8 hours (regardless of when the inoperable diesel generator is restored to operability) EITHER:

(1) Start the other diesel generator to verify operability, OR

(2) Ensure the absence of common cause for the diesel generator inoperability for the other diesel generator.

k. Not used. ~~If the inventory of diesel fuel oil in FO-1 is less than 16,000 gallons and/or FO-10 is less than 10,000 gallons, but the combined inventory in FO-1 and FO-10 is greater than a 6-day supply (23,350 gallons), then restore the required inventory within 48 hours.~~

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.7 Electrical Systems (Continued)

l. Island buses 1B3A-4A, 1B3B-4B, and 1B3C-4C may be inoperable for up to 8 hours provided there are no inoperable required safeguards components which are redundant to components on the inoperable bus(es).

m. Either one of the 125V d-c buses No. 1 or 2 (Panels EE-8F or EE-8G) may be inoperable for up to 8 hours.

n. Either one of the 125V d-c distribution panels AI-41A or AI-41B may be inoperable for up to 8 hours.

o. One inverter (A, B, C, or D) may be inoperable for up to 24 hours provided the reactor protective and engineered safeguards systems instrument channels supplied by the remaining three inverters are all operable and the 120V a-c instrument bus associated with the inoperable inverter is powered from its bypass source.

(3) Modification on Minimum Requirements for Diesel Fuel Oil, Diesel Lube Oil, and Starting Air

The minimum requirements may be modified to the extent that any of the following conditions will be allowed after the reactor coolant has been heated above 300°F. However, the reactor shall not be made critical unless all minimum requirements are met.

a. If the inventory of diesel fuel oil in FO-1 is less than 16,000 gallons and/or FO-10 is less than 10,000 gallons, but the combined inventory in FO-1 and FO-10 is greater than a 6 day supply (23,350 gallons), then restore the required inventory within 48 hours.

b. If one or more diesel generators has lube oil inventory < 500 gallons and > 450 gallons, then restore the lube oil inventory to within limits within 48 hours.

c. If the total particulates of fuel oil stored in FO-1 or FO-10 is not within limits, then restore fuel oil total particulates to within limits within 7 days.

d. If the properties of new fuel oil stored in FO-1 or FO-10 is not within limits, then restore stored fuel oil properties to within limits within 30 days.

e. If one or more diesel generators has the required starting air receiver bank with pressure < 190 psig and > 150 psig, then restore starting air receiver bank pressure to > 190 psig within 48 hours.

f. If the Required Action and associated Completion Time of a, b, c, d, or e are not met or one or more diesel generators have diesel fuel oil, lube oil, or a required starting air subsystem not within limits for reasons other than a, b, c, d, or e, then declare the associated DG inoperable immediately.

Basis

The electrical system equipment is arranged so that no single failure can inactivate enough engineered safeguards to jeopardize the plant safety. The 480 V safeguards are arranged on nine bus sections. The 4.16 kV safeguards are supplied from two buses.

The normal source of auxiliary power with the plant at power for the safeguards buses is from the house service power transformers being fed from the 161 Kv incoming line with on-site emergency power from either one of two diesel generators and off-site standby power via the unit auxiliary transformers.(1) The loss of the 161kV incoming line renders the house service transformers (T1A-3 and T1A-4) inoperable in that the transformers cannot supply power to the 4.16kV safeguards buses 1A3 and 1A4. Inoperability of the house service transformer(s) or loss of the 161kV incoming line is not reportable pursuant to 10 CFR 50.72 criteria; however, the NRC will be promptly notified of these events via the NRC Operations Center.

The two emergency diesel generators on site do not require outside power for start up or operation.

Upon loss of normal and standby power sources, the 4.16 Kv buses 1A3 and 1A4 are energized from the diesel generators. Bus load shedding, transfer to the diesel generator and pickup of critical loads are carried out automatically.(2)

When the turbine generator is out of service for an extended period, the generator can be isolated by opening motor operated disconnect switch DS-T1 in the bus between the generator and the main transformer, allowing the main transformer and the unit auxiliary power transformers (T1A-1 and T1A-2) to be returned to service.(3) The auxiliary power transformers are not considered inoperable during these normal plant startup/shutdown realignments.

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.7 Electrical Systems (Continued)

plant shutdown as required by Specification 2.7(3). This period is acceptable based on the remaining capacity (more than 6 days), the fact that procedures are in place to obtain replenishment, and the low probability of an event during this brief period.

Additional supplies of diesel fuel oil are available in the Omaha area and from nearby terminals. Ample facilities exist to assure deliveries to the site within 24 hours.

One battery charger on each battery shall be operating so that the batteries will always be at full charge; this ensures that adequate d-c power will be available for all emergency uses. Each battery has one battery charger permanently connected with a third charger capable of being connected to either battery bus. The chargers are each rated for 400 amperes at 130 volts. Following a DBA the batteries and the chargers will handle all required loads. Each of the reactor protective channels instrumentation channels is supplied by one of the a-c instrument buses. The removal of one of the a-c instrument buses is permitted as the 2-of-4 logic may be manually changed to a 2-of-3 logic without compromising safety.

The engineered safeguards instrument channels use a-c instrument buses (one redundant bus for each channel) and d-c buses (one redundant bus for each logic circuit). The removal of one of the a-c instrument buses is permitted as the two of four logic automatically becomes a two of three logic.

Required engineered safeguards components, as described in Specification 2.7(2), refers to components required to be operable by other Limiting Conditions for Operation within these Technical Specifications. If no other LCO requires a particular ESF component to be operable, then its redundant component is also not required to be operable due to this specification. As an example, Specification 2.3 requires that safety injection pumps be operable prior to the reactor being made critical, and Specification 2.7 applies when the RCS is above 300°F. If the RCS is above 300°F but the reactor is not critical, then no safety injection pumps are required to be operable.

The DG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated DG 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. The onsite storage in addition to the engine oil sump is sufficient to ensure 7 days of continuous operation. This supply is sufficient supply to allow the operator to replenish lube oil from outside sources. With lube oil inventory < 500 gallons, sufficient lubricating oil to support 7 days of continuous DG 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 to obtain the requisite replacement volume. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the DG 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.

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. FCS has a Diesel Fuel Oil Testing Program which includes proper fuel oil quality. This program includes purchasing, receipt testing of new fuel oil, and periodic analyses of the stored fuel oil. FCS is not committed to the fuel analysis portion of Regulatory Guide 1.137 (Ref. 4) or ANSI N195-1976 (Ref. 5); however, these standards were utilized as guidance in the development of the Diesel Fuel

Oil testing program. The fuel oil properties governed by these Surveillance Requirements are the water and sediment content, the kinematic viscosity, specific gravity (or API gravity), and impurity level. TS 2.7(3)c is entered as a result of a failure to meet the acceptance criterion of Table 3-5, Item 9c. 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 diesel engine, and particulate concentration is unlikely to change significantly between Surveillance intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, resampling, and re-analysis of the DG fuel oil.

With the new fuel oil properties defined in the Bases for Table 3-5, Item 9c 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 restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

Each DG has two starting air subsystems, each with adequate capacity for five successive start attempts of the DG without recharging the air start receivers. Either subsystem can fulfill the function of starting the DG, however the requirements of TS 3.7(1)a.i must be met for the required starting air subsystem. With starting air receiver bank pressure < 190 psig, sufficient capacity for five successive DG start attempts does not exist. However, as long as the receiver bank pressure is > 150 psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver bank 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 DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

References

(1) USAR, Section 8.3.1.2
(2) USAR, Section 8.4.1
(3) USAR, Section 8.2.2
(4) Regulatory Guide 1.137
(5) ANSI N195-1976

3.0 SURVEILLANCE REQUIREMENTS

3.2 Equipment and Sampling Tests (continued)

The RCS water inventory balance must be performed with the reactor at stable operating conditions (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and Reactor Coolant Pump (RCP) seal leakoff flows). Therefore, a note is added allowing that this surveillance requirement is not required to be performed until after establishing normal operating temperature and pressure.

Stable operation is required to perform a proper water inventory balance since calculations during maneuvering are not useful. For RCS operational leakage determined by water inventory balance, stable operation is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal leakoff flows. The water inventory balance should be performed as soon as practical after stable conditions are met.

During Plant startup, a visual leak check is performed at normal system pressure prior to entering MODE 3. This verification is performed to ensure no RCPB leaks exist.

Table 3-5, Item 9b ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG. The 500 gallon requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this Surveillance Requirement is the requirement to assure the capability to transfer the lube oil from its storage location to the DG, since 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 Surveillance interval 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.

For Table 3-5, Item 9c, 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 D4057-95(2000) (Ref. 2),

b. Verify in accordance with the tests specified in ASTM D975-98b (Ref. 2) 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° and ≤ 39° when tested in accordance with ASTM D287-82 (Ref. 2), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point ≥ 125°F, and

c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-93 or a water and sediment content within limits when tested in accordance with ASTM D2709-96 (Ref. 2).

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 D975-98b (Ref. 3) are met for new fuel oil when tested in accordance with ASTM D975-98b (Ref. 2), except that the analysis for sulfur may be performed in accordance with ASTM D129-00 (Ref. 2) or ASTM D2622-87 (Ref. 2). 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 in accordance with ASTM 6217-98 (Ref. 2) with the exception that the filters specified in the ASTM method may have a nominal pore size of up to 3 microns. 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 Surveillance interval of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Surveillance intervals.

Table 3-5, Item 9d 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 as the cranking time required to accelerate the DG to firing speed. The pressure specified in this Surveillance Requirement is intended to reflect the lowest value at which the five starts can be accomplished. The 31 day Surveillance interval 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.

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 92 days per Table 3-5, Item 9e, 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 interval is established to ensure excessive water does not accumulate in the fuel oil system, which meets the intent of Regulatory Guide 1.137 (Ref. 4). This Surveillance Requirement is for preventative maintenance. The presence of water does not necessarily represent failure of this Surveillance Requirement provided the accumulated water is removed during performance of the Surveillance.

References

1) USAR, Section 9.10
2) ASTM D4057-95(2000), ASTM D975-98b, ASTM D4176-93, ASTM D129-00, ASTM D2622-87, ASTM D287-82, ASTM 6217-98, ASTM D2709-96
3) ASTM D975-98b, Table 1
4) Regulatory Guide 1.137

TABLE 3-5

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

		Test	Frequency	USAR Section Reference
1.	Control Element Assemblies	Drop times of all full-length CEA's	Prior to reactor criticality after each removal of the reactor vessel closure head	7.5.3
2.	Control Element Assemblies	Partial movement of all CEA's (Minimum of 6 in)	Q	7
3.	Pressurizer Safety Valves	Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be 2485 psig ±1% and 2530 psig ±1% respectively.	R	7
4.	Main Steam Safety Valves	Set Point	R	4
5.	DELETED			
6.	DELETED			
7.	DELETED			
8.	Reactor Coolant System Leakage	Evaluate	D*	4
9a.	Diesel Fuel Supply	Fuel Inventory	~~D~~ M	8.4
9b.	Diesel Lubricating Oil Inventory	Lube Oil Inventory	M	8.4
9c.	Diesel Fuel Oil Properties	Test Properties	In Accordance with the Diesel Fuel Oil Testing Program	8.4
9d.	Required Diesel Generator Air Start	Air Pressure	M	8.4

	Receiver Bank Pressure				
9e.	Check For and Remove Accumulated Water From Each Fuel Oil Storage Tank	Check For Water and Remove	Q		8.4
10a.	Charcoal and HEPA Filters for Control Room	1. <u>In-Place Testing**</u> Charcoal adsorbers and HEPA filter banks shall be leak tested and show ≥99.95% Freon (R-11 or R-112) and cold DOP particulates removal, respectively.	On a refueling frequency or every 720 hours of system operation or after each complete or partial replacement of the charcoal adsorber/HEPA filter banks, or after any major structural maintenance on the system housing or following significant painting, fire or chemical releases in a ventilation zone communicating with the system.		9.10

* Whenever the system is at or above operating temperature and pressure.
** Tests shall be performed in accordance with applicable section(s) of ANSI N510-1980.

5.0 ADMINISTRATIVE CONTROLS

5.20 Technical Specifications (TS) Bases Control Program (Continued)

1. A change in the TS incorporated in the license or

2. A change to the USAR 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 USAR.

d. Proposed changes that meet the criteria of 5.20.b 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).

5.21 Containment Tendon Testing Program

This program provides controls for monitoring any tendon degradation in prestressed concrete containments, including effectiveness of its corrosion protection medium, to ensure containment structural integrity. The program shall include baseline measurements prior to initial operations. The Containment Tendon Testing Program, inspection frequencies, and acceptance criteria shall be in accordance with Regulatory Guide 1.35, Revision 3, 1989.

The provisions of TS 3.0.1 and TS 3.0.5 are applicable to the Containment Tendon Testing Program inspection frequencies.

If the acceptance criteria are not met, an immediate investigation shall be made to determine the cause(s) and extent of the non-conformance to the criteria, and the results shall be reported to the Commission within 90 days via a special report in accordance with Technical Specification 5.9.3.

5.22 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, or a water and sediment content within limits;

b. Within 31 days following addition of the new fuel oil to storage tanks, verify that the properties of the new fuel oil, other than those addressed in a., above, are within limits for ASTM 2D fuel oil, and

c. Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days.

The provisions of TS 3.0.1 and TS 3.0.5 are applicable to the Diesel Fuel Oil Testing Program test frequencies.

ATTACHMENT 3

Proposed
Clean-Typed
Technical Specification Pages

TECHNICAL SPECIFICATIONS
2.0 **LIMITING CONDITIONS FOR OPERATION**
2.7 Electrical Systems

Applicability

Applies to the availability of electrical power for the operation of plant components.

Objective

To define those conditions of electrical power availability necessary to provide for safe reactor operation and the continuing availability of engineered safety features.

Specifications

(1) Minimum Requirements

The reactor shall not be heated up or maintained at temperatures above 300°F unless the following electrical systems are operable:

a. Unit auxiliary power transformers TIA-1 or -2 (4,160 V).

b. House service transformers TIA-3 and 4 (4,160 V).

c. 4,160 V engineered safety feature buses 1A3 and 1A4.

d. 4,160 V/480 V Transformers TIB-3A, TIB-3B, TIB-3C, TIB-4A, TIB-4B, TIB-4C.

e. 480 V distribution buses 1B3A, 1B3A-4A, 1B4A, 1B3B, 1B3B-4B, 1B4B, 1B3C, 1B3C-4C, 1B4C.

f. MCC No. 3A1, 3B1, 3A2, 3C1, 3C2, 4A1, 4A2, 4C1 and 4C2.

g. 125 V d-c buses No. 1 and 2 (Panels EE-8F and EE-8G).

h. 125 V d-c distribution panels AI-41A and AI-41B.

i. 120V a-c instrument buses A, B, C, and D (Panels AI-40-A, B, C and D).

j. Inverters A, B, C, and D.

k. Station batteries No. 1 and 2 (EE-8A and EE-8B) including one battery charger on each 125V d-c bus No. 1 and 2 (EE-8F and EE-8G).

l. Two emergency diesel generators (DG-1 and DG-2).

m. One diesel fuel oil storage system containing a minimum volume of 16,000 gallons of diesel fuel in FO-1, and a minimum volume of 10,000 gallons of diesel fuel in FO-10.

n. Lubricating oil inventory for each DG is ≥ 500 gallons.

o. Each required starting air receiver bank pressure is ≥ 190 psig.

d. Either one of the 4.16kV engineered safeguards buses, 1A3 or 1A4 may be inoperable for up to 8 hours provided the operability of the diesel generator associated with the operable bus is demonstrated immediately and there are no inoperable required engineered safeguards components associated with the operable bus.

e. One of each group of 4160 V/480 V Transformers (T1B-3A or 4A), (T1B-3B or 4B), and (T1B-3C or 4C) may be inoperable for up to 8 hours provided there are no inoperable required engineered safeguards components which are redundant to components on the inoperable transformer.

f. One of the 480 V distribution buses connected to bus 1A3 or connected to bus 1A4 may be inoperable for up to 8 hours provided there are no inoperable required safeguards components which are redundant to components on the inoperable bus.

g. Either Group of MCC No.'s (3A1, 3B1, 3A2, 3C1, 3C2,) or (4A1, 4A2, 4C1, 4C2) may be inoperable for up to 8 hours provided there are no inoperable required safeguards components which are redundant to components on the inoperable MCC. MCC 3C1 may be inoperable in excess of 8 hours if battery chargers No. 1 and No. 2 are operable.

h. One of the four 120V a-c instrument buses (A, B, C or D) may be inoperable for 8 hours provided the reactor protective and engineered safeguards systems instrument channels supplied by the remaining three buses are all operable.

i. Two battery chargers may be inoperable for up to 8 hours provided battery charger No. 1 (EE-8C) or No. 2 (EE-8D) is operable.

j. Either one of the emergency diesel generators (DG-1 or DG-2) may be inoperable for up to seven days (total for both) during any month, provided there are no inoperable required engineered safeguards components associated with the operable diesel generator. If one diesel generator is inoperable, within 8 hours (regardless of when the inoperable diesel generator is restored to operability) EITHER:

   (1) Start the other diesel generator to verify operability, OR

   (2) Ensure the absence of common cause for the diesel generator inoperability for the other diesel generator.

k. Not used

l. Island buses 1B3A-4A, 1B3B-4B, and 1B3C-4C may be inoperable for up to 8 hours provided there are no inoperable required safeguards components which are redundant to components on the inoperable bus(es).

m. Either one of the 125V d-c buses No. 1 or 2 (Panels EE-8F or EE-8G) may be inoperable for up to 8 hours.

n. Either one of the 125V d-c distribution panels AI-41A or AI-41B may be inoperable for up to 8 hours.

o. One inverter (A, B, C, or D) may be inoperable for up to 24 hours provided the reactor protective and engineered safeguards systems instrument channels supplied by the remaining three inverters are all operable and the 120V a-c instrument bus associated with the inoperable inverter is powered from its bypass source.

(3) Modification on Minimum Requirements for Diesel Fuel Oil, Diesel Lube Oil, and Starting Air

The minimum requirements may be modified to the extent that any of the following conditions will be allowed after the reactor coolant has been heated above 300°F. However, the reactor shall not be made critical unless all minimum requirements are met.

a. If the inventory of diesel fuel oil in FO-1 is less than 16,000 gallons and/or FO-10 is less than 10,000 gallons, but the combined inventory in FO-1 and FO-10 is greater than a 6 day supply (23,350 gallons), then restore the required inventory within 48 hours.

b. If one or more diesel generators has lube oil inventory < 500 gallons and > 450 gallons, then restore the lube oil inventory to within limits within 48 hours.

c. If the total particulates of fuel oil stored in FO-1 or FO-10 is not within limits, then restore fuel oil total particulates to within limits within 7 days.

d. If the properties of new fuel oil stored in FO-1 or FO-10 is not within limits, then restore stored fuel oil properties to within limits within 30 days.

e. If one or more diesel generators has the required starting air receiver bank with pressure < 190 psig and > 150 psig, then restore starting air receiver bank pressure to > 190 psig within 48 hours.

f. If the Required Action and associated Completion Time of a, b, c, d, or e are not met or one or more diesel generators have diesel fuel oil, lube oil, or a required starting air subsystem not within limits for reasons other than a, b, c, d, or e, then declare the associated DG inoperable immediately.

Basis

The electrical system equipment is arranged so that no single failure can inactivate enough engineered safeguards to jeopardize the plant safety. The 480 V safeguards are arranged on nine bus sections. The 4.16 kV safeguards are supplied from two buses.

The normal source of auxiliary power with the plant at power for the safeguards buses is from the house service power transformers being fed from the 161 Kv incoming line with on-site emergency power from either one of two diesel generators and off-site standby power via the unit auxiliary transformers.[1] The loss of the 161kV incoming line renders the house service transformers (T1A-3 and T1A-4) inoperable in that the transformers cannot supply power to the 4.16kV safeguards buses 1A3 and 1A4. Inoperability of the house service transformer(s) or loss of the 161kV incoming line is not reportable pursuant to 10 CFR 50.72 criteria; however, the NRC will be promptly notified of these events via the NRC Operations Center.

The two emergency diesel generators on site do not require outside power for start up or operation.

Upon loss of normal and standby power sources, the 4.16 Kv buses 1A3 and 1A4 are energized from the diesel generators. Bus load shedding, transfer to the diesel generator and pickup of critical loads are carried out automatically.[2]

When the turbine generator is out of service for an extended period, the generator can be isolated by opening motor operated disconnect switch DS-T1 in the bus between the generator and the main transformer, allowing the main transformer and the unit auxiliary power transformers (T1A-1 and T1A-2) to be returned to service.[3] The auxiliary power transformers are not considered inoperable during these normal plant startup/shutdown realignments.

Minimum requirements are implemented prior to raising the RCS temperature above 300°F to assure availability of engineered safety features.

The time allowed to repair an inoperable inverter is based upon engineering judgement, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. In the event of inverter failure, the load on the inverter is automatically transferred to its safety related bypass source. The associated 120 V a-c instrument bus is considered OPERABLE when it is being powered from its bypass source and during the short time it takes to manually or automatically transfer between sources.

Equipment served by 4.16 kV and 480 V auxiliary buses and MCC's is arranged so that loss of an entire 4.16 kV bus does not compromise safety of the plant during DBA conditions. For example, if 4.16 kV bus 1A3 is lost, two raw water pumps, one low pressure safety injection pump, two high pressure safety injection pumps, one auxiliary feedwater pump, two component cooling water pumps, one containment spray pump and two containment air fans are lost. This leaves two raw water pumps, one low pressure safety injection pump, one high pressure safety injection pump, one component cooling water pump, two containment spray pumps and two containment air fans which is more than sufficient to control containment pressure below the design value during the DBA.

Each diesel generator has sufficient capacity to start and run at design load required by engineered safety features equipment. The safety features operated from one diesel generator can adequately cool the core for any loss of coolant accident and also maintain the containment pressure within the design value. The engine base tank capacity of 550 gallons on each diesel provides 3 hours running time (worst case loading) before transfer of fuel oil from the 18,000 gallon capacity emergency diesel generator fuel oil storage tank FO-1 is mandatory. Two fuel oil transfer pumps per diesel, with each being powered from the associated diesel, are available for transferring fuel oil from FO-1 to the day tanks. The minimum diesel fuel oil inventory available to the diesel generators from the emergency diesel generator fuel oil storage tank FO-1 is maintained to assure the operation of either: 1) one diesel generator at full rated design capacity for at least 3.6 days, or 2) one diesel generator at post accident load conditions for a minimum of 4.5 days.

A minimum amount of diesel fuel oil is reserved in the auxiliary boiler fuel oil storage tank FO-10 for transfer to the emergency diesel generator fuel oil storage tank in the event of an emergency to extend the fuel supply for diesel generator operation to 7 days. Methods of transfer of the fuel oil from this tank to FO-1 have been established and procedures have been developed so that the transfer can be made in a timely manner without adversely impacting diesel generator operation. Therefore, a minimum diesel fuel oil inventory available to the diesel generators from the total on-site diesel fuel oil storage capacity is maintained to assure the operation of one diesel generator at the required post accident loads for 7 days. The fuel inventory is allowed below the 7 day supply, but above a 6 day supply, for a period of 48 hours. This restriction allows sufficient time for obtaining the requisite replacement volume and performing the analyses required prior to addition of fuel oil to the tank. A period of 48 hours is considered sufficient to complete restoration of the required level prior to initiating a plant shutdown as required by Specification 2.7(3). This period is acceptable based on the remaining capacity (more than 6 days), the fact that procedures are in place to obtain replenishment, and the low probability of an event during this brief period. |

Additional supplies of diesel fuel oil are available in the Omaha area and from nearby terminals. Ample facilities exist to assure deliveries to the site within 24 hours.

One battery charger on each battery shall be operating so that the batteries will always be at full charge; this ensures that adequate d-c power will be available for all emergency uses. Each battery has one battery charger permanently connected with a third charger capable of being connected to either battery bus. The chargers are each rated for 400 amperes at 130 volts. Following a DBA the batteries and the chargers will handle all required loads. Each of the reactor protective channels instrumentation channels is supplied by one of the a-c instrument buses. The removal of one of the a-c instrument buses is permitted as the 2-of-4 logic may be manually changed to a 2-of-3 logic without compromising safety.

The engineered safeguards instrument channels use a-c instrument buses (one redundant bus for each channel) and d-c buses (one redundant bus for each logic circuit). The removal of one of the a-c instrument buses is permitted as the two of four logic automatically becomes a two of three logic.

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.7 Electrical Systems (Continued)

Required engineered safeguards components, as described in Specification 2.7(2), refers to components required to be operable by other Limiting Conditions for Operation within these Technical Specifications. If no other LCO requires a particular ESF component to be operable, then its redundant component is also not required to be operable due to this specification. As an example, Specification 2.3 requires that safety injection pumps be operable prior to the reactor being made critical, and Specification 2.7 applies when the RCS is above 300°F. If the RCS is above 300°F but the reactor is not critical, then no safety injection pumps are required to be operable.

The DG lubrication system is designed to provide sufficient lubrication to permit proper operation of its associated DG 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. The onsite storage in addition to the engine oil sump is sufficient to ensure 7 days of continuous operation. This supply is sufficient supply to allow the operator to replenish lube oil from outside sources. With lube oil inventory < 500 gallons, sufficient lubricating oil to support 7 days of continuous DG 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 to obtain the requisite replacement volume. A period of 48 hours is considered sufficient to complete restoration of the required volume prior to declaring the DG 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.

For proper operation of the standby DGs, it is necessary to ensure the proper quality of the fuel oil. FCS has a Diesel Fuel Oil Testing Program which includes proper fuel oil quality. This program includes purchasing, receipt testing of new fuel oil, and periodic analyses of the stored fuel oil. FCS is not committed to the fuel analysis portion of Regulatory Guide 1.137 (Ref. 4) or ANSI N195-1976 (Ref. 5); however, these standards were utilized as guidance in the development of the Diesel Fuel Oil testing program. The fuel oil properties governed by these Surveillance Requirements are the water and sediment content, the kinematic viscosity, specific gravity (or API gravity), and impurity level. TS 2.7(3)c is entered as a result of a failure to meet the acceptance criterion of Table 3-5, Item 9c. 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 diesel engine, and particulate concentration is unlikely to change significantly between Surveillance intervals, and proper engine performance has been recently demonstrated (within 31 days), it is prudent to allow a brief period prior to declaring the associated DG inoperable. The 7 day Completion Time allows for further evaluation, resampling, and re-analysis of the DG fuel oil.

With the new fuel oil properties defined in the Bases for Table 3-5, Item 9c 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 restore the stored fuel oil properties. This restoration may involve feed and bleed procedures, filtering, or combinations of these procedures. Even if a DG start and load was required during this time interval and the fuel oil properties were outside limits, there is a high likelihood that the DG would still be capable of performing its intended function.

Each DG has two starting air subsystems (primary and secondary), each with adequate capacity for five successive start attempts of the DG without recharging the air start receivers. Either subsystem can fulfill the function of starting the DG, however the requirements of TS 3.7(1)a.i must be met for the required starting air subsystem. With starting air receiver bank pressure < 190 psig, sufficient capacity for five successive DG start attempts does not exist. However, as long as the receiver bank pressure is > 150 psig, there is adequate capacity for at least one start attempt, and the DG can be considered OPERABLE while the air receiver bank 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 DG inoperable. This period is acceptable based on the remaining air start capacity, the fact that most DG starts are accomplished on the first attempt, and the low probability of an event during this brief period.

References

(1) USAR, Section 8.3.1.2
(2) USAR, Section 8.4.1
(3) USAR, Section 8.2.2
(4) Regulatory Guide 1.137
(5) ANSI N195-1976

3.0 SURVEILLANCE REQUIREMENTS

3.2 Equipment and Sampling Tests (continued)

The RCS water inventory balance must be performed with the reactor at stable operating conditions (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and Reactor Coolant Pump (RCP) seal leakoff flows). Therefore, a note is added allowing that this surveillance requirement is not required to be performed until after establishing normal operating temperature and pressure.

Stable operation is required to perform a proper water inventory balance since calculations during maneuvering are not useful. For RCS operational leakage determined by water inventory balance, stable operation is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal leakoff flows. The water inventory balance should be performed as soon as practical after stable conditions are met.

During Plant startup, a visual leak check is performed at normal system pressure prior to entering MODE 3. This verification is performed to ensure no RCPB leaks exist.

Table 3-5, Item 9b ensures that sufficient lube oil inventory is available to support at least 7 days of full load operation for each DG. The 500 gallon requirement is based on the DG manufacturer consumption values for the run time of the DG. Implicit in this Surveillance Requirement is the requirement to assure the capability to transfer the lube oil from its storage location to the DG, since 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 Surveillance interval 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.

For Table 3-5, Item 9c, 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 D4057-95(2000) (Ref. 2),

b. Verify in accordance with the tests specified in ASTM D975-98b (Ref. 2) 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° and ≤ 39° when tested in accordance with ASTM D287-82 (Ref. 2), a kinematic viscosity at 40°C of ≥ 1.9 centistokes and ≤ 4.1 centistokes, and a flash point ≥ 125°F, and

c. Verify that the new fuel oil has a clear and bright appearance with proper color when tested in accordance with ASTM D4176-93 or a water and sediment content within limits when tested in accordance with ASTM D2709-96 (Ref. 2).

3.2 Equipment and Sampling Tests (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 D975-98b (Ref. 3) are met for new fuel oil when tested in accordance with ASTM D975-98b (Ref. 2), except that the analysis for sulfur may be performed in accordance with ASTM D129-00 (Ref. 2) or ASTM D2622-87 (Ref. 2). 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 in accordance with ASTM 6217-98 (Ref. 2) with the exception that the filters specified in the ASTM method may have a nominal pore size of up to 3 microns. 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 Surveillance interval of this test takes into consideration fuel oil degradation trends that indicate that particulate concentration is unlikely to change significantly between Surveillance intervals.

Table 3-5, Item 9d 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 as the cranking time required to accelerate the DG to firing speed. The pressure specified in this Surveillance Requirement is intended to reflect the lowest value at which the five starts can be accomplished. The 31 day Surveillance interval 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.

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 92 days per Table 3-5, Item 9e, 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 interval is established to ensure excessive water does not accumulate in the fuel oil system, which meets the intent of Regulatory Guide 1.137 (Ref. 4). This Surveillance Requirement is for preventative maintenance. The presence of water does not necessarily represent failure of this Surveillance Requirement provided the accumulated water is removed during performance of the Surveillance.

3.2 Equipment and Sampling Tests (continued)

References

1) USAR, Section 9.10
2) ASTM D4057-95(2000), ASTM D975-98b, ASTM D4176-93, ASTM D129-00, ASTM D2622-87, ASTM D287-82 , ASTM 6217-98, ASTM D2709-96
3) ASTM D975-98b, Table 1
4) Regulatory Guide 1.137

TABLE 3-5

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

		Test	Frequency	USAR Section Reference
1.	Control Element Assemblies	Drop times of all full-length CEA's	Prior to reactor criticality after each removal of the reactor vessel closure head	7.5.3
2.	Control Element Assemblies	Partial movement of all CEA's (Minimum of 6 in)	Q	7
3.	Pressurizer Safety Valves	Verify each pressurizer safety valve is OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be 2485 psig ±1% and 2530 psig ±1% respectively.	R	7
4.	Main Steam Safety Valves	Set Point	R	4
5.	DELETED			
6.	DELETED			
7.	DELETED			
8.	Reactor Coolant System Leakage	Evaluate	D*	4
9a.	Diesel Fuel Supply	Fuel Inventory	M	8.4
9b.	Diesel Lubricating Oil Inventory	Lube Oil Inventory	M	8.4
9c.	Diesel Fuel Oil Properties	Test Properties	In Accordance with the Diesel Fuel Oil Testing Program	8.4
9d.	Required Diesel Generator Air Start Receiver Bank Pressure	Air Pressure	M	8.4

* Whenever the system is at or above operating temperature and pressure.

TABLE 3-5 (continued)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

		Test	Frequency	USAR Section Reference
9e.	Check For and Remove Accumulated Water From Each Fuel Oil Storage Tank	Check For Water and Remove	Q	8.4
10a.	Charcoal and HEPA Filters for Control Room	1. In-Place Testing** Charcoal adsorbers and HEPA filter banks shall be leak tested and show ≥99.95% Freon (R-11 or R-112) and cold DOP particulates removal, respectively.	On a refueling frequency or every 720 hours of system operation or after each complete or partial replacement of the charcoal adsorber/HEPA filter banks, or after any major structural maintenance on the system housing or following significant painting, fire or chemical releases in a ventilation zone communicating with the system.	9.10
		2. Labaratory Testing** Verify, within 31 days after removal, that a laboratory test of a sample of the charcoal adsorber, when obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows methyliodide penetration less than 0.175% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 70%.	On a refueling frequency or every 720 hours of system operation or after any structural maintenance on the HEPA filter or charcoal adsorber housing or following significant painting, fire or chemical release in a ventilation zone communicating with the system.	

** Tests shall be performed in accordance with applicable section(s) of ANSI N510-1980.

TABLE 3-5 (continued)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

		Test	Frequency	USAR Section Reference
10a.	(continued)	3. Overall System Operation		
		a. Each circuit shall be operated.	Ten hours every month.	
		b. The pressure drop across the combined HEPA filters and charcoal adsorber banks shall be demonstrated to be less than 9 inches of water at system design flow rate.	R	
		c. Fan shall be shown to operate within ± 10% design flow.	R	
		4. Automatic and manual initiation of the system shall be demonstrated.	R	
10b.	Charcoal Adsorbers for Spent Fuel Storage Pool Area	1. In-Place Testing** Charcoal adsorbers shall be leak tested and shall show ≥99% Freon (R-11 or R-112) removal.	On a refueling frequency or every 720 hours of system operation, or after each complete or partial replacement of the charcoal adsorber bank, or after any major structural maintenance on the system housing or following significant painting, fire or chemical release in a ventilation zone communicating with the system.	6.2 9.10
		2. Laboratory Testing Verify, within 31 days after removal, that a laboratory test of a sample of the charcoal adsorber, when obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows methyliodide penetration less than 10% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 95%.	On a refueling frequency or every 720 hours of system operation or after any structural maintenance on the HEPA filter or charcoal adsorber housing or following significant painting, fire or chemical release in a ventilation zone communicating with the system.	

** Tests shall be performed in accordance with applicable section(s) of ANSI N510-1980.

TABLE 3-5 (continued)

MINIMUM FREQUENCIES FOR EQUIPMENT TESTS

		Test	Frequency	USAR Section Reference
10b.	(continued)	3. Overall System Operation a. Operation of each circuit shall be demonstrated.	Ten hours every month.	
		b. Volume flow rate through charcoal filter shall be shown to be between 4500 and 12,000 cfm.	R	
		4. Manual initiation of the system shall be demonstrated.	R	
10c.	Charcoal Adsorbers for S.I. Pump Room	1. In-Place Testing** Charcoal adsorbers shall be leak tested and shall show ≥99% Freon (R-11 or R-112) removal.	On a refueling frequency or every 720 hours of system operation, or after each complete or partial replacement of the charcoal adsorber bank, or after any major structural maintenance on the system housing or following significant painting, fire or chemical release in any ventilation zone communicating with the system.	9.10 6.2
		2. Laboratory Testing Verify, within 31 days after removal, that a laboratory test of a sample of the charcoal adsorber, when obtained in accordance with Regulatory Position C.6.b of Regulatory Guide 1.52, Revision 2, March 1978, shows methyliodide penetration less than 10% when tested in accordance with ASTM D3803-1989 at a temperature of 30°C (86°F) and a relative humidity of 95%.	On a refueling frequency or following 720 hours of system operation or after any structural maintenance on the HEPA filter or charcoal adsorber housing or following significant painting, fire or chemical release in a ventilation zone communicating with the system.	
		3. Overall System Operation a. Operation of each circuit shall be demonstrated.	Ten hours every month.	
		b. Volume flow rate shall be shown to be between 3000 and 6000 cfm.	R	

** Tests shall be performed in accordance with applicable section(s) of ANSI N510-1980.

5.20 Technical Specifications (TS) Bases Control Program (Continued)

1. A change in the TS incorporated in the license or

2. A change to the USAR 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 USAR.

d. Proposed changes that meet the criteria of 5.20.b 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).

5.21 Containment Tendon Testing Program

This program provides controls for monitoring any tendon degradation in prestressed concrete containments, including effectiveness of its corrosion protection medium, to ensure containment structural integrity. The program shall include baseline measurements prior to initial operations. The Containment Tendon Testing Program, inspection frequencies, and acceptance criteria shall be in accordance with Regulatory Guide 1.35, Revision 3, 1989.

The provisions of TS 3.0.1 and TS 3.0.5 are applicable to the Containment Tendon Testing Program inspection frequencies.

If the acceptance criteria are not met, an immediate investigation shall be made to determine the cause(s) and extent of the non-conformance to the criteria, and the results shall be reported to the Commission within 90 days via a special report in accordance with Technical Specification 5.9.3.

5.22 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, or a water and sediment content within limits;

b. Within 31 days following addition of the new fuel oil to storage tanks, verify that the properties of the new fuel oil, other than those addressed in a., above, are within limits for ASTM 2D fuel oil, and

c. Total particulate concentration of the fuel oil is ≤ 10 mg/l when tested every 31 days.

The provisions of TS 3.0.1 and TS 3.0.5 are applicable to the Diesel Fuel Oil Testing Program test frequencies.