

# REQUEST FOR ADDITIONAL INFORMATION 317-2061 REVISION 1

4/6/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 09.05.04 - Emergency Diesel Engine Fuel Oil Storage and Transfer System  
Application Section: 9.5.4

QUESTIONS for Component Integrity, Performance, and Testing Branch 1 (AP1000/EPR Projects)  
(CIB1)

09.05.04-1

What specifications does the applicant have for tanks and tank coatings?

### Background

The applicant has committed to fuel oil quality and testing consistent with the SRP Acceptance Criteria, which are contained in RG 1.137, "Fuel-Oil Systems for Standby Diesel Generators." The RG cites ANS-59.51 (ANSI N195-1976) Standard as a principal reference, which in turn cites ASTM D975. This last standard (ASTM D975) mentions that exposure to Cu or Zn could enhance the fuel degradation and promote gel formation (Section X3.7.2).

09.05.04-2

- a) What is the sampling frequency for water in GTG fuel oil day tanks?
- b) What is the required time frame for corrective actions if water is found in the GTG fuel oil day tanks?
- c) What is the required time for corrective actions if water is found in the GTG fuel oil storage tanks?
- d) Other than new fuel oil prior to addition to the tanks, how often is the fuel oil stored in the GTG fuel oil storage tanks sampled and tested?
- e) What tests are performed on the fuel oil periodically sampled from the GTG fuel oil storage tanks? What are the acceptance criteria?
- f) Justify the 30-day time frame allowed for correcting fuel oil properties that are outside of specification limits, since applicable regulatory guidance specifies a 1-week period for corrective action.

### Background

The applicant has committed to fuel oil quality and testing consistent with the SRP Acceptance Criteria, which are contained in RG 1.137, "Fuel-Oil Systems for Standby

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Diesel Generators.” The RG cites ANS-59.51 (ANSI N195-1976) Standard as a principal reference, which in turn cites ASTM D975. As mentioned in DCD Section 9.5.4.3, the fuel oil is sampled periodically for specific gravity, water, sediment, viscosity, contamination, and algae. Specific details of this sampling and corrective action are described in the technical specifications (DCD Chapter 16). The frequency of checking for and removing accumulated water in storage tanks is set at 31 days (Surveillance Requirement 3.8.3.5), consistent with RG 1.137 (Section C.2.e). However, there is no time frame specified for removal of water if found. The only fuel oil property with a required time frame is for corrective action in the technical specifications is particulate levels (Ch. 16, p. B 3.8.3-4, Action C.1) for which one week is allowed for correction. By contrast, whereas RG 1.137 requires immediate removal of water for day tanks (Section C.2.e), and requires the GTG be considered inoperable if water exceeds the limit for supply tanks (C.2.a). Also, the applicant does not mention sampling frequency for other quantities such as specific gravity, sediment, viscosity, contamination, and algae in storage tanks and day tanks, but ANSI N195-1976 requires at least quarterly sampling (Appendix B). The applicant specifies a 30-day period for correction of stored fuel oil properties to within limits in T.S 3.8.3 D.1, while the time allowed by RG 1.137 C.2.e for correcting most deficiencies is about one week.

09.05.04-3

For new fuel, justify the acceptability of verification of a clear and bright appearance instead of testing the water and sediment content.

### Background

To assure compliance with GDC 17 as it relates to the capability of the diesel engine fuel oil system (in this case, the gas turbine generator) to meet independence and redundancy criteria, SRP Section 9.5.4 references Regulatory Guide 1.137 as acceptable guidance with respect to the fuel oil properties and testing program. RG 1.137 C.2.b recommends three properties be tested for new fuel:

1. Specific or API gravity
2. Water and Sediment
3. Viscosity

The tests performed on the new fuel described in technical specification 5.5.13 are consistent with those recommended by RG 1.137 C.2.b, with the exception that verifying a clear and bright appearance is considered an acceptable alternative to testing water and sediment.

09.05.04-4

The applicant is requested to address the equivalency of the standards for fuel oil properties and sampling procedures referenced in technical specification bases B 3.8.3, to the standards for fuel oil properties and sampling procedures cited in Regulatory Guide 1.137.

### Background

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To assure compliance with GDC 17 as it relates to the capability of the diesel engine fuel oil system (in this case, the gas turbine generator) to meet independence and redundancy criteria, SRP Section 9.5.4 references Regulatory Guide 1.137 as acceptable guidance with respect to the fuel oil properties and testing program. RG 1.137 references ASTM D975-77 as the standard for fuel oil, and ASTM D270-75 for the periodic sampling procedure.

For the US-APWR, technical specification bases B 3.8.3 references ASTM D975-07b as the standard for fuel oil properties, and ASTM D4057-06 as a standard governing sampling of the fuel oil.

09.05.04-5

The applicant is requested to specify how and when the day and supply tanks should be emptied of fuel and cleaned.

### Background

To assure compliance with GDC 17 as it relates to the capability of the diesel engine fuel oil system (in this case, the gas turbine generator) to meet independence and redundancy criteria, SRP Section 9.5.4 references Regulatory Guide 1.137 as acceptable guidance with respect to the fuel oil properties and testing program. RG 1.137 (C.2.f) requires that fuel oil tanks be emptied and cleaned at least every ten years. The DCD does not mention any cleaning process or frequency.