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

Clinton Power Station, Unit 1
Facility Operating License No. NPF-62
NRC Docket No. 50-461

Subject: Additional Information Related to License Amendment Request for Adoption of Technical Specifications Task Force-501 (TAC No. ME4850)

References:

1. Letter from J. L. Hansen (Exelon Generation Company, LLC (EGC)) to U. S. NRC, "License Amendment Request for Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-501, Revision 1, 'Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control,'" dated October 8, 2010

2. Letter from U. S. NRC to Mr. M. J. Pacilio (EGC), "Clinton Power Station, Unit No. 1 - Request for Additional Information Related to Request for Adoption of Technical Specification Task Force-501 (TAC No. ME4850)," dated December 7, 2010

3. Letter from P. R. Simpson (EGC) to U. S. NRC, "Response to Request for Additional Information Regarding License Amendment Request for Adoption of Technical Specifications Task Force (TSTF) Traveler TSTF-501, Revision 1, 'Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control,' (TAC No. ME4850)," dated January 6, 2011

4. Letter from U. S. NRC to Mr. M. J. Pacilio (EGC), "Clinton Power Station, Unit No. 1 - Request for Additional Information Related to Request for Adoption of Technical Specification Task Force-501 (TAC No. ME4850)," dated January 21, 2011

In Reference 1, Exelon Generation Company, LLC (EGC) requested an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License No. NPF-62 for Clinton Power Station, Unit 1 (CPS). The proposed change modifies the CPS TS by implementing the guidance found in Technical Specifications Task Force (TSTF) Traveler TSTF-501, "Relocate Stored Fuel Oil and Lube Oil Volume Values to Licensee Control," Revision 1.

In Reference 2, the NRC requested that EGC provide additional information in support of their review of Reference 1. The information requested in Reference 2 was provided in Reference 3.

In Reference 4, the NRC requested that EGC provide additional information in support of their review of Reference 1. The NRC's request for additional information and the specific EGC responses are provided in the Attachment to this letter.

The information provided in this letter does not affect the No Significant Hazards Consideration, or the Environmental Consideration provided in Attachment 1 of the original license amendment request as described in the Reference 1 submittal.

In accordance with 10 CFR 50.91(b), "State consultation," EGC is providing the State of Illinois with a copy of this letter and its attachment to the designated State Official.

This letter contains no new regulatory commitments. If you have any questions concerning this letter, please contact Mr. Mitchel A. Mathews at (630) 657-2819.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 24th day of February, 2011.

Respectfully,

Jeffrey L. Hansen
Manager – Licensing
Exelon Generation Company, LLC

Attachment: Additional Information Supporting the Clinton Power Station Request for Adoption of Technical Specifications Task Force-501

ATTACHMENT

Additional Information Supporting the Clinton Power Station Request for Adoption of Technical Specifications Task Force-501

Request No 1. Provide the expected change in accident loading for each emergency diesel generator (EDG) over the 7-day accident period.

Request No. 1 Response:

In response to this request, Exelon Generation Company, LLC (EGC) postulated three scenarios for the seven-day period following a worst case accident loss of offsite power (LOOP)/loss of coolant accident (LOCA). The operational sequence and single failure criteria described in Clinton Power Station, Unit 1 (CPS) Updated Safety Analysis Report (USAR) Section 6.3 and Tables 6.3-1, "Operational Sequence of Emergency Core Cooling Systems for Design-Basis Accident," 6.3-7, "Single Failure Evaluation," and 6.3-8, "ECCS Design Parameters for Clinton Power Station," were used in selecting the appropriate scenarios to evaluate. These scenarios were developed to demonstrate the extent of margin in the CPS emergency diesel generator (EDG) fuel oil storage requirements calculation. Descriptions of the three scenarios including the status of the major loads that were considered for each EDG and resulting EDG loading for each of the seven days following the accident described above are outlined in Tables 1 through 3 below.

Table 1: Scenario No. 1 - Seven Days Following Accident

Division/Component		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Division 1	Residual Heat Removal A	ON	ON	ON	ON	ON	ON	ON
	Low Pressure Core Spray	ON	ON	ON	OFF	OFF	OFF	OFF
	Division 1 EDG Loading (kW)	3760.9	3760.9	3760.9	2803.5	2803.5	2803.5	2803.5
Division 2	Residual Heat Removal B	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Residual Heat Removal C	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Division 2 EDG Loading (kW)	0	0	0	0	0	0	0
Division 3	High Pressure Core Spray	ON	OFF	OFF	ON	ON	ON	ON
	Division 3 EDG Loading (kW)	2056	0	0	2056	2056	2056	2056

Table 2: Scenario No. 2 - Seven Days Following Accident

Division/Component		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Division 1	Residual Heat Removal A	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Low Pressure Core Spray	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Division 1 EDG Loading (kW)	0	0	0	0	0	0	0
Division 2	Residual Heat Removal B	ON	ON	ON	ON	ON	ON	ON
	Residual Heat Removal C	ON	ON	ON	OFF	OFF	OFF	OFF
	Division 2 EDG Loading (kW)	3315.6	3315.6	3315.6	2839.8	2839.8	2839.8	2839.8
Division 3	High Pressure Core Spray	ON	OFF	OFF	ON	ON	ON	ON
	Division 3 EDG Loading (kW)	2056	0	0	2056	2056	2056	2056

Table 3: Scenario No. 3 - Seven Days Following Accident

Division/Component		Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Division 1	Residual Heat Removal A	ON	ON	ON	ON	ON	ON	ON
	Low Pressure Core Spray	ON	OFF	OFF	OFF	OFF	OFF	OFF
	Division 1 EDG Loading (kW)	3760.9	2803.5	2803.5	2803.5	2803.5	2803.5	2803.5
Division 2	Residual Heat Removal B	ON	OFF	OFF	OFF	OFF	OFF	OFF
	Residual Heat Removal C	ON	ON	ON	ON	ON	ON	ON
	Division 2 EDG Loading (kW)	3315.6	2839.8	2839.8	2839.8	2839.8	2839.8	2839.8
Division 3	High Pressure Core Spray	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Division 3 EDG Loading (kW)	0	0	0	0	0	0	0

ATTACHMENT

Additional Information Supporting the Clinton Power Station Request for Adoption of Technical Specifications Task Force-501

At CPS, fuel oil volume calculations are based on maximum post-LOCA loading applied to the entire seven-day time period for each EDG. This methodology was selected to allow a single load limit for each EDG to be provided to Operations personnel. Moreover, the CPS calculation methodology yields a bounding fuel oil volume requirement for each EDG; therefore, there are no limit restrictions on the load changes. This affords flexibility to Operations in managing EDG loads based on the individual load limits specified by the calculation.

Request No 2. ***Provide the rate of fuel oil consumption for each EDG at full load conditions and at overload conditions. How are the rates of consumption established (recent testing, original equipment manufacturer data, etc.)? Have the EDG efficiencies been verified? Do the fuel oil volume calculations assume a linear change in the fuel oil consumption at different loading conditions? Are the fuel oil consumption rates used for Ultra Low Sulfur Diesel fuel?***

Request No. 2 Response:

The rate of fuel oil consumption for each EDG at full load and overload conditions can be found in Table 4 below. Full load is assumed to be maximum post-LOCA load and overload is the nameplate rating, as maximum post-LOCA loading never exceeds the nameplate value for each EDG.

Table 4: EDG Fuel Oil Consumption at Full Load and Overload Conditions

EDG	Consumption at Full Load (lbs/kW-hr)	Consumption at overload (lbs/kW-hr)
Division 1	0.53	0.53
Division 2	0.532	0.53
Division 3	0.53	0.53

Rates of consumption are based on the vendor-guaranteed rates of consumption. CPS performed pre-operation testing to determine fuel consumption rates, which were lower than factory provided data. Consequently, the factory test data is used because the values are conservative, and determined using an accurate method and are the most reliable data available.

CPS does not verify diesel efficiencies on an ongoing basis; however, the CPS EDG maintenance program has been developed from multiple sources including the engine manufacturer, owners' groups, industry, and site specific experience resulting in optimum engine performance, availability and reliability. Thus, assurance is provided that the CPS EDGs are maintained in a condition that ensures efficiencies are maintained.

The guaranteed EDG fuel oil consumption rate provided by the vendor is 0.53 lbs/kW-hr at 100% of rated load, 0.54 lbs/kW-hr at 75% of rated load and 0.60 lbs/kW-hr at 50% of rated load. Since the consumption rates are non-linear, a polynomial chart was prepared from these values and used for the fuel oil consumption analysis.

The consumption rate has been corrected in the consumption equation by using the 1.2% reduction in energy content identified in NRC Information Notice (IN) 2006-22," New Ultra-low-sulfur Diesel Fuel Oil Could Adversely Impact Diesel Engine Performance," dated October 12, 2006, for ultra-low sulfur diesel fuel. This approach is consistent with fuel manufacturer recommendations.

Request No 3. ***Does the Clinton Power Station fuel oil volume calculation method yield conservative results compared to the American National Standards Institute (ANSI) N195-1976 method (i.e., account for the 10 percent margin, account for the fuel oil volume consumed by testing) for each EDG?***

Request No. 3 Response:

Table 5 below describes the CPS stored fuel oil volume requirements considering the time-dependent loading provided in the response to Request No. 1, including fuel oil consumed by testing (i.e., T Value from ANSI N195-1976 Section 5.4) and 10% margin. Fuel consumption is calculated based on the worst-case loading of the three postulated scenarios that were developed in response to Request No. 1 above. This shows that there is margin to required stored fuel oil volume in the CPS calculation method and that the CPS method is conservative compared to the N195-1976 method for each EDG as shown in Table 5 below.

Table 5: Comparison of the Clinton Power Station Stored Fuel Oil Volume Calculation Method to the ANSI N195-1976 Method

EDG	Required Stored Fuel Oil Based on Time-Dependent Loads (gal)		Required Stored Fuel Oil According to the CPS Calculation Method (gal)	Fuel Oil Storage Tank Design Capacity (gal)
	Time Dependent	110%*(Time Dependent + T)		
Division 1	41274	46345	51000	54000
Division 2	39114	43896	45000	54000
Division 3	18684	21164	29500	36000

Request No 4. ***Provide the amount of fuel oil volume consumed by testing (the value T in ANSI N195-1976) for each EDG.***

Request No. 4 Response:

The monthly test performed for each EDG is approximately one hour at rated load and one hour at unloaded conditions. This is sufficient time to conclude the test. To provide a bounding value, the fuel oil consumption during testing was calculated using maximum post-LOCA loading for the duration of the two-hour test. The results of these calculations are provided in Table 6 below.

Table 6: Fuel Oil Consumption During Testing (i.e. T in ANSI N195-1976) for Each CPS EDG

EDG	T (gal)
Division 1	570
Division 2	502
Division 3	311