

From: Joel Wiebe
Sent: Friday, August 18, 2023 1:03 PM
To: Nicely, Ken M.:(Exelon Nuclear)
Subject: Clinton Power Station, Unit 1, Preliminary Requests for Additional Information (RAIs) Related to the Amendment Request to Revise Diesel Generator Starting Air Technical Specifications

Hi Ken,

We would like to have a clarification call regarding these RAIs within a week of this email. The purpose of providing preliminary RAIs is to ensure the NRC staff has clearly identified the information it needs to complete its review of the amendment request.

Joel

REQUEST FOR ADDITIONAL INFORMATION
RELATED TO DG AIR START SYSTEM AMENDMENT REQUEST
CONSTELLATION ENERGY GENERATION
CLINTON POWER STATION, UNIT 1
DOCKET NOS. 50-461

By application dated March 1, 2023 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23060A258), Constellation Energy Generation (the licensee) submitted a license amendment request (LAR) for the Clinton Power Station, Unit 1 to modify Technical Specifications (TS) Section 3.8.3, "Diesel Fuel Oil, Lube Oil, and Starting Air," to delete Condition E that allows a required Diesel Generator (DG) to be considered operable with reduced starting air capability and to clarify that only one air start receiver with adequate pressure is required for the associated starting air system to be considered operable. In addition, Condition F is revised to reflect the deletion of Condition E.

General Design Criterion (GDC) 17, "Electric power systems," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR 50 requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components (SSCs) that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure.

SRP 9.5.6 "EMERGENCY DIESEL ENGINE STARTING SYSTEM" acceptance criteria invoke GDC 17 as it relates to the capability of the diesel engine air starting system to meet independence and redundancy criteria.

RAI 1

The licensee requests changing Surveillance Requirement (SR) 3.8.3.4 from "Verify each required DG air start receiver pressure is ≥ 200 psig to "Verify each air start pressure is ≥ 200 psig." As indicated in the LAR, each DG has an air start system with adequate capacity for five successive start attempts of the DG without recharging the air start receiver(s).

The intent of air starting system SR 3.8.3.4 is contained in NUREG-1434 (Standard Technical Specifications (STS)) which reads in part, "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." The proposed change removes the pressurized requirement for the individual receiver and requires the overall system to remain above the pressure required for five starts (≥ 200 psig). With the SR revised as proposed, both receivers will not be required to meet the five-start requirement and could meet TS requirements with only one receiver operable.

Section 9.5.6.1.1 of Clinton's Final Safety Analysis Report (FSAR) states, "The diesel-generator starting systems for the Divisions I, II, and III diesel engines are independent and redundant for each division. Each diesel generator starting system consists of two full capacity air starting subsystems. Each

subsystem has a rated capacity capable of starting its respective engine set five times without recharging the associated air receiver. The rated air capacity of each subsystem is 93 ft.³ at 250 psig for the Division I and II DGs and 64 ft.³ at 240 psig for the Division III DG. All three DGs are capable of multiple successive starts without recharging the air receiver tank when the air receiver pressure is below the rated air pressure but above 200 psig. “

The staff understands the terminology of “diesel generator air starting system” contained in FSAR Section 9.5.6.1.1 to represent the overall air start system (containing 2 receivers) supplying it’s respective DG (Div I, II, or III). Additionally, each “diesel generator air starting system” consists of two redundant air starting “subsystems”. The FSAR indicates each subsystem has a rated capacity for starting its respective engine set five times.

The staff requests that the licensee:

1. Provide a description of what components define the “system” and “sub-system” and their operability requirements with the proposed TS changes.
2. Describe how the system is normally aligned for the DG for the Divisions I, II, and III. Also, define independence and redundancy within each division containing full capacity subsystems/systems and how the TS change impacts redundancy, as defined in FSAR 9.5.6.

RAI 2

The DG air start system safety function is to assure reliable starting of the emergency diesel engines in the event of a loss of offsite power. SRP 9.5.6 states the consequences of a single active failure in a starting air system will not lead to a loss of more than one diesel generator. Consistent with SRP criteria, FSAR Section 9.5.6.1.1.c indicates “A failure of a single active or passive component for one division will not prevent another division from performing its intended function.”

GDC 17 requires the onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure.

SRP 9.5.6 further indicates “Piping interconnections between the dedicated air start systems are reviewed for whether a failure in the interconnecting piping could lead to the loss of starting for more than one diesel engine.”

The staff requests that the licensee confirm that failure of single receiver will not result in multiple DGs being inoperable.

RAI 3

GDC 17 requires the onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure. Specific criteria and guidance necessary to meet GDC 17 requirements are indicated in Section 9.5.6 of NUREG-0800 (Standard Review Plan (SRP)) as follows: “C. As a minimum, the air starting system should be capable of cranking a cold diesel engine five times without recharging the receiver(s). The air starting system capacity should be determined as follows: (i) each cranking cycle duration should be approximately three seconds, (ii) consist of two to three engine revolutions, or (iii) air start requirements per engine start provided by the engine manufacturer, whichever air start requirement is larger.”

Current SR 3.8.3.4 requires that EDG starting air receiver pressure be maintained greater than or equal to 200 psig. This value is based on capacity as defined in FSAR Section 9.5.6.1.1 which specifies “Each subsystem has a rated capacity capable of starting its respective engine set five times without recharging the associated air receiver.”

Current TS 3.8.3 allows operating for 48 hours when pressure requirements are met for only one of the two starting air receivers. That is, up to 48 hours is allowed to restore the pressure of the DG receiver prior to declaring the DG inoperable. TS 3.8.3 further requires receiver pressure remain greater than 140 psig. NUREG-1434 defines lower specified pressure as allowance for

an extension of 48 hours prior to having to declare the EDG inoperable based on the assessment that the minimum pressure will be sufficient for a reliable start with one attempt. The licensee's basis for current TS criteria is defined in the Bases for TS 3.8.3 (Condition E) as, "With the required starting air receiver pressure < 200 psig, sufficient capacity for multiple DG start attempts may not exist. However, as long as the receiver pressure is \geq 140 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."

The licensee proposed to delete Condition E that allows a required DG to be considered operable with reduced starting air capability. The LAR indicates "This determination was made because the capability of one successful start attempt cannot be assured when starting air receiver pressure falls to the lower limit of 140 psig." With the proposed change, licensee removes the ability to consider the impacted DG operable with a minimum TS pressure requirement ensuring one start. As a result, overall air starting system pressure falling below the 200 psig SR requirement results in immediate entry into LCO 3.8.1 and declaring the impacted DG inoperable.

The NRC staff requests that the licensee confirm that the system meets the 5-start criteria (12 second fast start) with air receiver pressure at the proposed SR 200 psig and how the pressure is defined, calculated, tested, and monitored.

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