From:	Zackary Stone (He/Him/His)
Sent:	Wednesday, April 26, 2023 12:26 PM
To:	Rusty Towell; Lester Towell; Tim Head; Jordan Robison
Cc:	Edward Helvenston; Richard Rivera; Zackary Stone (He/Him/His); Michael Wentzel; Greg Oberson (He/Him); Adakou Foli
Subject:	Abilene Christian University - Audit Questions Regarding ACU CP Chapters 1, 5, 8, 9 (Except 9.2 and 9.6), 10, 11, 12, 14-18, and General Topics (Batch 2)
Attachments:	Audit Questions Regarding Chapters 1, 5, 8, 9 (Except 9.2 and 9.6), 10, 11, 12, 14-18, and General Topics (Batch 2).pdf

Dear Dr. Towell,

Attached is a list of questions the NRC staff has prepared for Abilene Christian University (ACU) related to the ACU Preliminary Safety Analysis Report, Chapter 8, “Electrical Power Systems.” The NRC staff would like to discuss these questions within the scope of the ACU construction permit (CP) application review Audit Plan for Chapters 1, 5, 8, 9 (Except 9.2 and 9.6), 10, 11, 12, 14-18, and General Topics (see audit plan dated 3/2/2023, ML23065A052), and I am providing these in advance to facilitate discussion during an audit meeting. Once ACU is ready to discuss, please let us know and we can set up an audit meeting. We will add this e-mail, with questions, to public ADAMS. If you have any questions, please let Edward, Richard, or I know.

Thank you,

Zackary Stone, Project Manger
Advanced Reactor Licensing Branch 2
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No. 50-610

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Chapter 8, "Electrical Power Systems" (General questions relevant to entire chapter)

Item #	Reviewer(s)	Date Sent to ACU (Accession No.)	PSAR Chapter or Topic	Question
8-1	A. Foli	4/26/2023	8	Criterion 17, "Electric power systems," states, in part, "…If electric power is not needed for anticipated operational occurrences or postulated accidents, the design shall demonstrate that power for important to safety functions is provided." PSAR section 8.2 states, in part, "Considering Design Criterion 17, Electric power systems, electric power systems are provided to permit functioning of structures, systems, and components. Safe shutdown and long-term decay heat removal are passive, and no electric power is required. The Chapter 13 analyses show that with complete loss of electrical power the design limits for fission product barriers are not exceeded. Thus, the bases for Design Criterion 17 are met with no electrical power required for safe shutdown, decay heat removal or accident mitigation." Based on the NRC staff's review, it's not apparent that the PSAR Chapter 8 provides any discussions about the important to safety functions for which electrical power is provided. a. Please discuss the "important to safety" functions or loads, for which the power will be provided to meet the bases of the Design Criteria 17.
8-2	A. Foli	4/26/2023	8	PSAR Table 3.4-1, "Structures, Systems, and Components and Associated Quality Level Group," identified the normal electrical power as safety-related and the backup electrical power as non-safety-related. PSAR section 8.1 states, in part, "The normal electrical power system does not perform any safety-related functions and is not credited for the mitigation of postulated events or performing safe shutdown functions." PSAR section 8.2 states, in part, "The UPS systems do not perform any safety-related functions and are not credited for mitigation of postulated events. The systems are used for monitoring functions and are not credited with maintaining or performing safe shutdown functions. […] Consistent with Design Criterion 18, Inspection and testing of electric power systems, electric power systems are designed to permit appropriate periodic inspection and testing. However, because loss of power shuts down the reactor and long-term decay heat removal is passive, inspection and testability will be limited to components necessary to ensure trip functions." In PSAR section 3.1.2.2, Criterion 18, "Inspection and testing of electric power systems," states, in part, " Electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features, such as wiring, insulation, connections, and switchboards, to assess the continuity of the systems and the condition of their components."

				Based on the NRC staff's review, it appears that the safety classification of the normal power system and the backup power systems is not consistent in the PSAR, and whether the electrical power systems include any components necessary to ensure trip functions. Also, with respect to the design criterion 18, it does not appear that the safety classification of the normal and backup electrical power systems as "important to safety" or "non-safety- related" is clear. a- Provide the safety classification (i.e., safety-related, non-safety-related, important to safety) of the normal electrical power system and the emergency (backup) electrical power system. Table 3.4-1 should be consistent on the safety classification for the normal and backup electrical power systems. b- Clarify if the normal electrical power system and the backup electrical power system will be inspected and tested following the requirements of the design criterion 18. If not, clarify whether the design criteria 18 is applicable to the electrical power systems and how the normal and backup electrical power systems meet the design criterion 18.

Chapter 8, Section 8.1, "Normal Electrical Power System"

Item #	Reviewer(s)	Date Sent to ACU (Accession No.)	PSAR Chapter or Topic	Question
8.1-1	A. Foli	4/26/2023	8.1	The NRC staff notes the reactor operations that require normal electrical power, as described in other chapters of the PSAR, are not discussed in PSAR Chapter 8. The NRC staff noted the following examples of equipment/system are expected require the normal electrical power: • Electrical heaters used to preheat the reactor system and the heat removal system during startup and low power operation. • Ventilation, and air conditioning systems • Control rod drives • Instrumentation and controls systems (Figure 7.2-1) • Reactor trip valves, reactor pump, and coolant pumps • Reactor thermal management system • Primary and auxiliary heat removal system (electrical heaters and air blowers) Please confirm that the normal electrical power is provided to the above-mentioned equipment/systems and provide additional equipment/systems that will be supplied by the normal electrical power, if any. Also, specify the equipment/systems that are safety-related and require electrical isolation from the non-safety-related normal electrical power equipment in PSAR Chapter 8.