

Responses to Public Comments

Comments from Progress Energy (Tony Groblewski)

Comment #PE-1: *Draft Regulatory Guide DG-1137 addresses ensuring that safety-related systems are not rendered inoperable or cause spurious actuations due to the influence of lightning strikes. It also states that lightning protection is essential to avoid malfunctions and upsets that in turn can lead to reactor trips. The main contributor to operational plant upsets leading to reactor trips due to lightning strikes is the effect on the non safety power producing equipment of the plant, not the safety-related equipment. Such non safety related equipment is typically less protected against lightning strikes and weather effects than the safety-related equipment. In many cases such equipment is outdoors or in an open turbine building.*

Response #PE-1: The charter of NRC is to ensure the safe operation of nuclear reactors, hence the reason why the draft guide (DG) addresses ensuring that safety-related systems are not rendered inoperable by lightning strikes. It is true that non-safety related power producing equipment whose failure can affect the performance/function of safety-related equipment can also be impacted by lightning strikes and measures should be taken to protect them. Wording will be added to the DG to include non-safety related equipment whose failure can impact the function and performance of safety-related equipment.

Comment #PE-2: *The guidance can be improved by including lightning and surge protection guidance for critical non-safety related equipment that, if lost due to lightning effects, would lead to reactor trips. Examples of such equipment are: Main Power Transformers, Condensate Pumps, Condensate Booster Pumps, Heater Drain Pumps, Main Feedwater Pumps, Service Water Pumps, Circulating Water Pumps, and associated electric power distribution systems for the pump motors.*

Response #PE-2: The scope of the regulatory guidance includes protection of (1) the power plant and relevant ancillary facilities, with the boundary beginning at the service entrances of buildings; (2) the plant switchyard; (3) the electrical distribution system, safety-related I&C systems, communications, and personnel within the power plant; and (4) other important equipment in remote ancillary facilities that could impact safety. This includes any equipment (including transformers and pumps) that, if rendered inoperable by lightning effects, would lead to reactor trips. In particular, IEEE Std 666 and IEEE Std C62.23 discuss the protection of these types of equipment. No changes are warranted.

Comments from TVA (Fredrick Mashburn)

Comment #TVA-1: *The DG does not specifically recognize alternate methods of lightning protection such as Browns Ferry's Dissipation Array System (DAS). The DG provides comments as endorsement and regulatory position, thus, it should further stipulate that it is not intended to preclude or eliminate the possibility of using alternative methods of lightning protection such as the Charge Transfer System (CTS). The CTS would include DAS as currently installed at*

Browns Ferry. There are applications when the CTS approach must be considered. In fact, many of the locations where the supplier integrated a DAS, conventional lightning rod systems were already provided as outlined in National Fire Protection Association (NFPA) or Institute of Electrical and Electronic Engineers (IEEE).

Response #TVA-1: The DG is based on industry standards and does not specifically distinguish between various methods of lightning protection. There is mention of alternative methods in the endorsed industry standards, but these methods are not adopted by the standards. The perception is that the claimed performance for such methods has yet to be validated because the methods are proprietary and detailed design information is not publicly available. To the extent that any alternative methods are incorporated into industry standards in the future, such methods may be recognized by NRC. The wording in the DG will be revised to reflect that if any new and improved lightning protection systems are incorporated into subsequent revisions of the industry standards, they may be endorsed appropriately upon the review and acceptance of the standards.

Comment #TVA-2: *Our primary comments are that any guidelines that are generated from the NRC in regard to lightning protection should have some flexibility. This flexibility would allow the end user the opportunity for consideration of alternative methods and the NRC guidelines should, at the very least, reference these alternative methods. This is the same approach that NFPA has reflected in the current standard. In regard to NFPA 780, the latest standard is NFPA 780 2004 edition.*

Response #TVA-2: The DG provides acceptable guidelines to the NRC staff for lightning protection and flexibility is built into the regulatory process. As reflected in Response #TVA-1, alternative methods with appropriate technical bases and justification can subsequently be recognized by the regulatory guidance on lightning protection based on the endorsement of alternative methods in the industry standards. With regard to NFPA 780, it is not clear that the 2004 revision of NFPA 780 does provide the degree of flexibility described in the comment. The only reference that can be found in NFPA 780 related to alternative lightning protection systems is in Subsection 1.1.3 and states "This document shall not cover lightning protection system installation requirements for early streamers emission systems or charge dissipation systems." In this regard, it is noted that the wording of this subsection is unchanged from the previous version, the 2000 edition. No changes are warranted.

Comment #TVA-3: *TVA agrees with the proposed requirements as outlined in the testing and maintenance of the lightning protection systems. These testing, inspection and maintenance requirements would include the conventional and CTS technologies. Further, we agree with the requirements for the integration of strategic surge protection and optimum grounding practices. These are all critical to a properly operating unified lightning protection system that will provide the designed lightning protection capability throughout the life of the system.*

Response #TVA-3: The DG is not a "requirement." It proposes guidelines that are acceptable to the staff. The comment endorses the testing and maintenance practices described in the DG. No changes are warranted.