

Pre-Workshop Comment on DG-1145 Offsite & Onsite AC Systems:

DG-1145 Sections C.I.8 and C.III.1 Chapter 8 do not recognize the fact that passive plant designs do not require any AC power for accident / transient mitigation.

DG-1145 Issue:

Sections C.I.8.2, and C.III.1 Section 8.2 do not provide any distinction between active and passive designs with respect to requirements for offsite power. The Westinghouse AP-1000 and GE ESBWR are passive plants and do not require any class 1E AC power. The sections should be revised to clarify the differentiation (refer to markup). The requirements for Failure Modes & Effect Analysis (FMEA) for sites that have exemptions to GDC 17 has no meaning, e.g. a single failure can result in a loss of the one offsite source. The impact of this loss is inconsequential from a safety perspective since the plant does not rely upon any AC power for mitigation.

Background Information:

10 CFR 50 Appendix A, General Design Criterion (GDC) 17 provides the regulatory requirements for electric power systems for commercial nuclear power reactors. The GDC contains requirements for offsite and onsite power, as well as AC and DC systems. The EPRI Utility Requirements Document (URD) for Advanced Light Water Reactors (ALWR) contains the design requirements for plant systems. Volume III of the URD contains the requirements for "Passive Plants", which utilize passive systems for accident / transient mitigation. The URD defines a passive system as follows

1.4.1.24 Passive System - a system which is essentially self-contained or self supported, which relies on natural forces, such as gravity or natural circulation, or stored energy, such as batteries, rotating inertia and compressed fluids, or an energy inherent to the system itself for its motive power, and check valves and non-cycling powered valves (which may change state to perform their intended functions, but do not require a subsequent change of state nor continuous availability of power to maintain their intended functions).

By definition, passive plants do not require AC power (onsite or offsite).

On July 24, 1995, the NRC Staff issued a position paper titled, "Consolidation of SECY-94-084 and SECY-95-132". This position paper provides the staff process for evaluation of Regulatory Requirements for Non-Safety Systems (RTNSS) in Passive Plant Designs. In section G of this paper the staff acknowledges that the majority of the AC system in a passive plant is non-safety related, and that a passive plant does not require a second offsite source. The paper states that the AC distribution system should be evaluated using the RTNSS process described in section A of the paper.

As part of the design certification process for the AP-1000, Westinghouse submitted a design that only had 1 offsite source supply to a non-1E AC onsite distribution system. The back-up onsite AC system consisted of 2 non-safety related diesel generators. The NRC included a RTNSS evaluation of this design as part of their review, and concluded

that availability controls were required for the standby diesel generators and the one-offsite source. The staff also concluded that a second offsite source was not required, and received an exemption to GDC 17 with regards to 2 offsite sources (reference Appendix D of Part 52, AP-1000 Design Certification Rule).