Item A-44: Station Blackout (Rev. 1)

DESCRIPTION

The complete loss of AC electrical power to the essential and nonessential switchgear buses in a nuclear power plant is referred to as a "Station Blackout." Because many safety systems required for reactor core decay heat removal are dependent on AC power, the consequences of a station blackout could be a severe core damage accident. The technical issue involves the likelihood and duration of the loss of all AC power and the potential for severe core damage after a loss of all AC power.

The issue of station blackout arose because of the historical experience regarding the reliability of AC power supplies. There had been numerous reports of emergency diesel generators failing to start and run in operating plants. In addition, a number of operating plants experienced a total loss of offsite electrical power. In almost every one of these loss of offsite power events, the onsite emergency AC power supplies were available

to supply the power needed by vital safety equipment. However, in some instances, one of the redundant emergency power supplies had been available. In a few cases, there was a complete loss of AC power, but during these events AC power was restored in a short time without any serious consequences.

The results of WASH-1400[1] showed that, for one of the two plants evaluated, a station blackout accident could be an important contributor to the total risk from nuclear power plant accidents. Although this total risk was found to be small, the relative importance of station blackout accidents was established. This finding and the concern for diesel generator reliability based on operating experience raised station blackout to a USI in the 1979 NRC

Annual Report. A detailed action plan for resolving this issue was published in NUREG-0649,[2] Revision 1.

CONCLUSION

The final evaluation of station blackout accidents at nuclear power plants was performed by the staff and published in NUREG-1032.[3] In resolving this issue, the staff performed a regulatory analysis which was documented in NUREG-1109.[4] In June 1988, this USI was resolved with publication of a new rule (53 FR

23203)[5] and Regulatory Guide 1.155.[6] Thus, this issue was RESOLVED and new requirements were established.

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[1] WASH-1400 (NUREG-75/014), "Reactor Safety Study: An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," U.S. Atomic Energy Commission, October 1975.
[2] NUREG-0649, "Task Action Plans for Unresolved Safety Issues Related to Nuclear Power Plants," U.S. Nuclear Regulatory Commission, February 1980, (Rev. 1) September 1984.
[3] NUREG-1032, "Evaluation of Station Blackout Accidents at Nuclear Power Plants," U.S. Nuclear Regulatory Commission, June 1988.
[4] NUREG-1109, "Regulatory/Backfit Analysis for the Resolution of Unresolved Safety Issue A-44, Station Blackout," U.S. Nuclear Regulatory Commission, June 1988.
[5] Federal Register Notice 53 FR 23203, "10 CFR 50, Station Blackout," June 21, 1988.
[6] Regulatory Guide 1.155, "Station Blackout," U.S. Nuclear Regulatory Commission, June 1988.
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