POLICY ISSUE
(Notation Vote)

December 2, 2005 SECY-05-0219

FOR: The Commissioners

FROM: Luis A. Reyes
Executive Director for Operations /RA/

SUBJECT: ISSUANCE OF NUCLEAR REGULATORY COMMISSION GENERIC LETTER 2005-XX, "GRID RELIABILITY AND THE IMPACT ON PLANT RISK AND THE OPERABILITY OF OFFSITE POWER"

PURPOSE:

This paper informs the Commission that the staff intends to issue the subject generic letter (GL). The proposed GL is provided as Enclosure 1. Enclosure 2 provides the staff resolution of public comments. This paper does not address any new commitments or resource implications.

BACKGROUND:

On August 14, 2003, the largest power outage in U.S. history occurred in the Northeastern United States and parts of Canada. Nine U.S. nuclear power plants (NPPs) tripped. Eight of them lost offsite power, along with one NPP that was already shut down. The length of time until power was available to the switchyard ranged from one hour to six and one half hours. Although the onsite emergency diesel generators (EDGs) functioned to maintain safe shutdown conditions, the event was significant in terms of the number of plants affected and the duration of the power outage.

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The loss of all alternating current (AC) power at nuclear power plants involves the simultaneous loss of offsite power (LOOP), turbine trip, and the loss of the onsite emergency power supplies (typically EDGs). This situation is called a station blackout (SBO). Risk analyses of nuclear power plants indicate that the loss of all AC power can be a significant contributor to the core damage frequency. Although nuclear power plants are designed to cope with a LOOP event by using onsite power supplies, LOOPs are considered to be precursors to SBO. An increase in the frequency or duration of LOOPs increases the risk of core damage.

Based on inspection information and risk insights, the staff is concerned that several issues associated with assurance of grid reliability may impact public health and safety and/or compliance with applicable regulations. These issues are use of long-term periodic grid studies and informal communication arrangements to monitor real-time grid operability, potential shortcomings in grid reliability evaluations done as part of maintenance risk assessments, lack of preestablished arrangements identifying local grid power sources and transmission paths for response to a station blackout, and potential elimination of grid events from operating experience and training. The staff identified these issues as a result of considering the August 14, 2003, blackout event.

DISCUSSION:

The NRC issued a regulatory issue summary (RIS 2004-5, “Grid Operability and the Impact on Plant Risk and the Operability of Offsite Power,” dated April 15, 2004) to sensitize NPP addressees to the requirements in Section 50.65 of Title 10 of the Code of Federal Regulations (10 CFR 50.65), “Requirements for monitoring the effectiveness of maintenance at nuclear power plants”; 10 CFR 50.63, “Loss of all alternating current power”; 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 17, “Electric power systems”; and plant technical specifications on the operability of offsite power. NRC also issued Temporary Instruction (TI) 2515/156, “Offsite Power System Operational Readiness,” dated April 29, 2004; and TI 2515/163, “Operational Readiness of Offsite Power,” dated May 05, 2005, which instructed the regional offices to perform followup inspections at plant sites on the issues identified in the RIS.

The staff found considerable variability and uncertainty in licensees’ responses to TIs 2515/156 and 2515/163. The switchyard degraded voltage condition at the Callaway nuclear plant on August 11, 1999, was attributed to a high service territory demand combined with large amounts of power being transported across the grid. The staff is still assessing significant operating experience such as the event on June 14, 2004, when an electrical fault on the 230kV transmission line about 40 miles from the Palo Verde Nuclear Station caused the trip of all three units, a LOOP, and the loss of six additional fossil-fueled generating units nearby within about 30 seconds of the start of the fault.

On April 26, 2005, the Commission was briefed on grid stability and offsite power issues by a stakeholder panel consisting of representatives of the Federal Energy Regulatory Commission (FERC), the North American Electric Reliability Council (NERC), the National Association of Regulatory Utilities Commissioners, PJM Interconnection (one of the country’s largest transmission system operators), a First Energy Corporation executive representing the Nuclear Energy Institute, and the NRC staff. On May 19, 2005, the Commission issued a staff

requirements memorandum (SRM), directing the staff to issue the subject generic letter by December 15, 2005.

The GL asks addressees to provide information on four topics:

(1) The use of protocols between the nuclear power plants (NPPs) and the transmission system operators (TSOs), independent system operators (ISOs), or reliability coordinators/authorities (RCs/RAs) and the TSO's use of real-time contingency analysis (RTCA)[1] software or an equivalent state of the art software program to assist NPPs in monitoring grid conditions to determine the operability of offsite power systems under plant technical specifications (TSOs, ISOs, or RCs/RAs are responsible for preserving the reliability of the local transmission system. In this GL, TSO includes ISOs and RCs/RAs);

(2) the use of NPP/TSO protocols and RTCA programs by TSOs to assist NPP operators in monitoring grid conditions for consideration in maintenance risk assessments;

(3) the offsite power restoration procedures in accordance with Section 2 of NRC Regulatory Guide (RG)1.155, "Station Blackout"; and

(4) LOOPs caused by grid failures at a frequency equal to or greater than once in 20 site-years in accordance with RG 1.155, "Station Blackout."

Under the provisions of Section 182a of the Atomic Energy Act of 1954, as amended, and 10 CFR 50.54(f), this GL requests that addressees provide responses to the questions in the generic letter within 60 days of the issuance of the GL.

A draft of this GL was placed in the *Federal Register*. The staff's response to the public comments on the draft is given in Enclosure 2.

COORDINATION:

The Advisory Committee on Reactor Safeguards (ACRS) reviewed the generic letter during its 527th meeting on November 3, 2005, and recommended that it be issued. The Committee To Review Generic Requirements (CRGR) reviewed and endorsed the generic letter during its 405th meeting on November 8, 2005. The staff incorporated the CRGR's comments on the GL.

[1] In this GL, the RTCA includes equivalent state of the art programs.

The Office of the General Counsel has no legal objection to this paper. The Office of the Chief Financial Officer (OCFO) determined that a review of the GL was unnecessary and that OCFO has no objections based on budget or financial management concerns.

The GL is not a "rule" under the Small Business Regulatory Enforcement Fairness Act of 1996.

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Enclosures:
1. NRC Generic Letter 2005-XX
2. Staff Resolution of Public Comments

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