

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555

July 19, 2005

NRC INFORMATION NOTICE 2005-20: ELECTRICAL DISTRIBUTION SYSTEM  
FAILURES AFFECTING SECURITY EQUIPMENT

**ADDRESSEES**

All holders of operating licenses for power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor.

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to inform addressees about the adverse impact of electrical distribution system failures on security systems. The NRC anticipates that recipients will review the information for applicability to their facilities and consider taking actions, as appropriate, to avoid similar issues. However, no specific action or written response is required.

**DESCRIPTION OF CIRCUMSTANCES**

On June 14, 2004, a ground fault occurred on a 230kV transmission line at a location some distance from the Palo Verde Nuclear Generating Station. A failure in the protective relaying prevented the immediate isolation of the ground fault from the local grid and caused a loss of offsite power and reactor trips of all three Palo Verde units. The Unit 2 Train A emergency diesel generator (EDG) started but did not complete the load sequencing process due to a failed diode in the exciter rectifier circuit. As a result the Train A engineered safeguards feature busses deenergized, causing the loss of some security equipment. Other aspects of this event were previously discussed in NRC Information Notice 2005-15, "Three-Unit Trip and Loss of Offsite Power at Palo Verde Nuclear Generating Station," issued on June 1, 2005.

On June 29, 2004, a complete loss of security power occurred while operators were troubleshooting the security power distribution system at the Watts Bar Nuclear Plant. An operator opened a panel door and removed a subpanel cover to verify the system parameters for an uninterruptible power supply (UPS). The operator then reattached the subpanel cover but did not verify that the latching screw adequately secured the subpanel cover to the outer panel frame. Subsequently, when the operator closed the panel door, the subpanel cover rocked off of the latching mechanism and nicked a ribbon cable, causing a short to ground and the eventual loss of all security power.

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On January 14, 2005, water intrusion into the central alarm station (CAS) master electrical distribution panel resulted in arcing in the vicinity of the power supply circuit breaker to the CAS at the Millstone Power Station. The ensuing fire caused a loss of electrical power to multiple security systems. Although the security EDG was available during the event, the electrical fault and fire also prevented the licensee from transferring loads to the EDG.

On February 8, 2005, a short circuit and fire occurred in an outdoor cable tray at the Turkey Point Nuclear Plant, resulting in the loss of some plant security equipment. The fire also resulted in the loss of the normal power supply to a security UPS; however, all security systems powered by the UPS remained energized. On February 17, 2005, a second event occurred at Turkey Point when a component of the security UPS overheated and started a fire. Operators immediately opened circuit breakers at the UPS, causing all security systems serviced by the UPS to be lost.

## **DISCUSSION**

Failures of electrical distribution systems that supply electrical power to plant security systems can cause significant, prolonged outages of equipment normally relied on by security personnel to provide intrusion detection and access control and to respond to security incidents. In all of the events described above, the affected licensees implemented compensatory security measures in response to the security system degradations. Other licensees are reminded to consider these types of failures when developing and reviewing security procedures for responding to degraded equipment.

Licensees are also encouraged to ensure that security equipment undergoes preventive maintenance and is subject to corrective action programs similar to programs for safety-related equipment. In addition, licensees should consider taking actions to identify single points of failure which may not have been recognized in the original design of or modifications to these systems .

## CONTACT

This information notice does not require any specific action or written response. Please direct any questions about this matter to the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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Note: NRC generic communications may be found on the NRC public Website, <http://www.nrc.gov>, under Electronic Reading Room/Document Collections.

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