

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, DC 20555-0001

November 1, 2010

NRC INFORMATION NOTICE 2010-23: MALFUNCTIONS OF EMERGENCY DIESEL  
GENERATOR SPEED SWITCH CIRCUITS

**ADDRESSEES**

All holders of an operating license or construction permit for a nuclear power reactor issued under Title 10 of the *Code of Federal Regulations*, Part 50, "Domestic Licensing of Production and Utilization Facilities," except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

**PURPOSE**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees about recent examples of malfunctions of emergency diesel generator (EDG) speed switch circuits. The NRC expects that recipients will review the information for applicability to their facilities and consider actions, as appropriate, to avoid similar problems. Suggestions contained in this IN are not NRC requirements; therefore, no specific action or written response is required.

**DESCRIPTION OF CIRCUMSTANCES**

Wolf Creek Generating Station

On October 22, 2009, with the Wolf Creek Generating Station in a refueling outage, the control room annunciator for the "A" EDG actuated. The licensee took the "A" EDG out of service for troubleshooting. The cause of the event was the actuation of the speed switch in the starting circuit of the "A" EDG because of high alternating current (ac) noise on the direct current (dc) supply circuit of the speed switch. The source of this electrical noise was traced to the annunciator power supply within the EDG gauge board panel. The noise was more than the filtering capacity of the capacitor installed on the dc feed to the speed switch. The licensee replaced the annunciator power supply and the speed switch. It also established a preventive maintenance activity to have the ac ripple voltage measured at the dc supply circuit. Additional information appears in Wolf Creek Generating Station Licensee Event Report 50-482/2009-005, dated December 21, 2009, on the NRC's public Web site in the Agencywide Documents Access and Management System (ADAMS) under Accession No. ML093640041.

San Onofre Nuclear Generating Station

On December 12, 2009, at San Onofre Nuclear Generating Station Unit 3, during the performance of a test required by the technical specifications, the train "A" EDG failed to start because a capacitor failed in one of the two dc-dc converter power supplies for the local panel

**ML102420002**

annunciator. The failed capacitor caused excessive ripple voltage and spiking on the speed switch circuits, causing the speed switch to change state prematurely, preventing the engine from starting. Licensee corrective action included replacing the annunciator power supplies on all the EDGs with more recently manufactured units. Additional information appears in San Onofre Nuclear Generating Station Licensee Event Report 50-362/2009-002, dated February 10, 2010, in ADAMS under Accession No. ML100470689.

## **DISCUSSION**

Licensees are required to maintain EDGs in an operable condition as specified in the technical specifications. The two events described above are recent examples of malfunctions of speed switches on EDGs resulting from noise caused by degraded annunciator power supplies. Industry operating experience during the last 7 years shows approximately 10 additional examples where EDGs were rendered inoperable because of speed switch malfunctions. Three of these events were caused by the inadequate filtering of electrical noise or ripple voltages. The noise can be caused by the age-related degradation of noise-filtering capacitors in the power supplies.

## **CONTACT**

This IN requires no 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.

*/RA by TQuay for/*

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

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ADAMS Accession Number: ML102420002

TAC ME4083

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