UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
OFFICE OF NEW REACTORS
WASHINGTON, DC 20555-0001

November 24, 2009

NRC INFORMATION NOTICE 2009-29: POTENTIAL FAILURE OF FIRE WATER SUPPLY PUMPS TO AUTOMATICALLY START DUE TO A FIRE

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* (10 CFR) 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.

All holders of or applicants for an early site permit, standard design certification, standard design approval, or combined license issued under 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

All licensees and potential applicants for fuel cycle and fabrication facilities under 10 CFR Part 70, "Domestic Licensing of Special Nuclear Material."

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees about recent NRC inspection findings concerning the potential for a fire to prevent the fire water pumps from starting automatically. The NRC expects addressees to review the information for applicability to their facilities and to consider taking 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.

BACKGROUND

The fire water supply system at U.S. commercial nuclear power plants typically consists of two or more redundant main fire pumps that are normally in a standby state. One pump is usually electrically driven, and the other pump is diesel-engine driven. These pumps discharge to a buried fire water main loop around the plant. A normally operating electric-driven jockey pump is a low-flow capacity pump that discharges to the fire water main loop to maintain its pressurized state. When a demand for fire water system flow occurs because a suppression system actuates or a fire hose is discharged, the jockey pump flow is not sufficient to maintain the fire water main loop in its pressurized state. The main fire pumps each have a fire pump controller that automatically starts the pump when it receives a low water pressure signal in the

fire water main loop. The automatic start feature ensures that adequate water flow is available for a sprinkler or water spray system to control a fire and for a fire brigade to have adequate hose streams to suppress a fire. Each main fire pump can also be started manually, either locally at the pump or remotely from the control room.

DESCRIPTION OF CIRCUMSTANCES

At South Texas Project, Units 1 and 2, and at Wolf Creek Generating Station, Unit 1, NRC inspectors identified that a fire could prevent the main fire pumps from starting remotely or automatically. The fire pump controllers have a remote start capability from the control room. A fire could cause a ground fault on the cable between the control room remote start pushbutton and the fire pump controller in the fire water pump house. The ground fault would cause electrical protective devices in the respective fire pump control panel to actuate. If this were to occur, the loss of control power to the panel would prevent the pumps from starting, either remotely or automatically. The licensees at both facilities located the remote start circuit cables for the fire pumps (i.e., three pumps at South Texas Project and the electrically driven pump at Wolf Creek, Unit 1) close to each other from the control room switches through various plant fire areas and to the respective control panels in the pump house. Because the cables are close to each other, damage from a single fire could prevent all fire water pumps at South Texas Project from starting remotely or automatically.

As an interim measure, the licensees at South Texas Project and Wolf Creek revised their fire alarm response procedures for the fire areas that could affect the fire water pumps from starting remotely or automatically by adding a step to send an operator to ensure that the fire water pumps had started or to locally start the pumps as necessary. The licensee at Wolf Creek later determined that the diesel driven fire pump would still function as required.

Additional information appears in “South Texas Project Electric Generating Station—NRC Triennial Fire Protection Inspection Report 05000498/2008008 and 05000499/2008008 and Exercise of Enforcement Discretion,” dated September 5, 2008, available on the NRC’s public Web site in the Agencywide Documents Access and Management System (ADAMS), ADAMS Accession No. ML082520793. Additional information also appears in “Wolf Creek Generating Station—NRC Triennial Fire Protection Inspection Report 05000482/2008010,” dated January 2, 2009, ADAMS Accession No. ML090020490.

DISCUSSION

Failure of the automatic start feature of the fire water supply pumps would impair water-based automatic fire suppression systems. Furthermore, the failure of the pumps to start upon demand from a fire hose could impair manual suppression activities. The regulations at 10 CFR 50.48, “Fire Protection,” and Appendix R, “Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979,” to 10 CFR Part 50 require licensees to install fire suppression systems in certain fire areas to protect redundant trains of safe-shutdown equipment and electrical circuits against fires. Section III.G.2 of Appendix R requires automatic suppression systems in some fire areas for certain fire protection methods for post-fire safe-shutdown equipment. Plants licensed after January 1, 1979, have commitments for automatic suppression systems in their approved fire protection program. If a licensee has routed cables

that can potentially prevent a fire pump from starting through one of these fire areas and has installed a water-based automatic fire suppression system in the area, it may not meet the automatic fire suppression requirement.

National Fire Protection Association Standard 20, "Standard for the Installation of Centrifugal Fire Pumps," 1983 Edition, states that control circuits leaving or entering the fire pump controller shall be so arranged as to prevent failure to start due to a fault. Licensees may have this standard as part of their approved fire protection program.

CONTACT

This IN requires no specific action or written response. Please direct any questions about this matter to the technical contacts listed below or to the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

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