

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

August 17, 2009

NRC INFORMATION NOTICE 2009-14: PAINTING ACTIVITIES AND CLEANING AGENTS
RENDER EMERGENCY DIESEL GENERATORS
AND OTHER PLANT EQUIPMENT INOPERABLE

ADDRESSEES

All holders of operating licenses and construction permits for nuclear power reactors under the provisions of 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 current and potential applicants for an early site permit, combined license, or standard design certification for a nuclear power plant under the provisions of 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

PURPOSE

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice (IN) to inform addressees of operating experience in which painting or cleaning activities rendered plant equipment inoperable, particularly a recent event at Comanche Peak in which an emergency diesel generator (EDG) was rendered inoperable. 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

Comanche Peak Unit 1—Paint Renders EDG Inoperable

On November 21, 2007, the train B EDG at Comanche Peak Unit 1 failed to start because of what appeared to be paint residue from a small drop of paint on one of the fuel pump metering rods. The location of the paint residue prevented movement of the fuel racks from their normal standby (closed) position in response to a governor demand signal, and the train B EDG was declared inoperable. The lack of movement of the mechanical linkage precluded the admission of sufficient fuel to all of the cylinders, which prevented the engine from starting. The residue was removed and the EDG was successfully started, declared operable, and returned to service.

ML091980474

Licensee corrective actions for this event included the following:

- Manipulated the fuel racks on the other three EDGs manually to determine their condition and to verify that no common-mode failure state existed.

Revised the general plant painting procedure to do the following:

- Require a post-maintenance “pull test” of the fuel pump control rack mechanisms to ensure that they are free to operate (in addition to visual inspections of the diesel engine area).
- Require “as you go” inspection and cleanup when painting around sensitive components.
- Add an attachment capturing the pictures and information presently contained in the pre-job briefing notebook used by painters.
- Included this event in the pre-job briefing for painters to heighten their sensitivity to the problems that paint drops and spatter can cause for mechanical linkages.
- Had system engineering staff review the information in the painters’ pre-job briefing notebook to ensure that it references all sensitive areas on the EDG that should not be painted.

Additional information appears in the Comanche Peak Steam Electric Station—NRC Special Inspection Report 05000445/2007008, dated February 29, 2008, available on the NRC’s public Web site in the Agencywide Documents Access and Management System (ADAMS) under Accession No. [ML080600164](#). This event was also the subject of Comanche Peak Licensee Event Report (LER) 50-445/2007-001, dated January 17, 2008 (ADAMS Accession No. [ML080240252](#)).

Other Examples of Painting or Cleaning Activities Impacting Plant Equipment

The NRC Operating Experience Branch reviewed other events in which painting or cleaning activities impacted plant equipment that were the subject of NRC inspection findings since 2000 and of LERs since 1991. These LER and NRC inspection finding data describe painting or cleaning activities that adversely impacted various plant equipment, such as EDGs, turbine-driven auxiliary feedwater pumps, a high-pressure coolant injection pump, control room emergency ventilation, radiation monitors, charcoal iodine filters, the control room pressure boundary, welding activities, standby or station blackout diesel generators, and fire doors/fire protection equipment. Additionally, at least three reactor trips were attributed, in part, to painting activities.

A listing and brief description of each of these NRC inspection findings and LERs is publically available in ADAMS under Accession No. [ML091600446](#). This listing shows that events often involved one or more of the following causal factors:

- inadequate supervisory oversight (mentioned for more than half of these events)
- lack of self-verification
- lack of adherence to procedures
- lack of training
- inexperience
- procedural problems
- poor pre-job briefings
- communication issues
- program weaknesses
- poor scheduling/planning
- other work control issues

Licensee corrective actions have included the following:

- improved tools and techniques that painters can use to minimize and/or control paint drops and paint spatter
- periodic and post-maintenance verification of any safety-related equipment potentially impacted by the painting or cleaning activity

BACKGROUND

The NRC has previously issued the following related generic communications:

- [IN 93-76, "Inadequate Control of Paint and Cleaners for Safety-Related Equipment,"](#) dated September 21, 1993, describes an EDG that was rendered inoperable by a cleaning agent that removed the lubricating oil and left a white residue that prevented fuel rack movement. It also describes a cleaning agent containing a solvent that caused the plastic parts of 16 safety-related control switches to bond together, making the switches inoperable.
- [IN 91-46, "Degradation of Emergency Diesel Generator Fuel Oil Delivery Systems,"](#) dated July 18, 1991, describes EDGs that were rendered inoperable by paint on fuel rack components or on exciter commutator rings.

DISCUSSION

The improper control of materials and processes for painting and cleaning activities near safety-related equipment can result in systems required by the technical specifications being rendered inoperable. Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50 establishes quality assurance requirements for safety-related equipment at nuclear power plants. The pertinent requirements of Appendix B apply to all activities affecting the safety-related functions of equipment, including painting and cleaning.

CONTACT

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

/RA/

Glenn Tracy, Director
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Theodore R. Quay for

Timothy J. McGinty, Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Technical Contact: Mark King, NRR
301-415-1150
E-mail: Mark.King@nrc.gov

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

CONTACT

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

/RA/

Theodore R. Quay for

Glenn Tracy, Director
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Timothy J. McGinty, Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Technical Contact: Mark King, NRR
301-415-1150
E-mail: Mark.King@nrc.gov

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

ADAMS Accession Number: ML092010047 (Package); ML091980474 (IN); ML091600446 (IN Painting Activities) TAC ME0725

OFFICE	DIRS/IOEB	*TECH EDITOR	BC/DCI/CPTB	AC/DIRS/IOEB	D/NRR/DIRS
NAME	MKing	KAzariah-Kribbs	JMcHale	EThomas	FBrown
DATE	07/28/09	07/28/09 e-mail	08/04/09	07/29/09	08/05/09 for by RElliot
OFFICE	DPR/PGCB	DPR/PGCB	BC/DPR/PGCB	D/NRR/DPR	D/DCIP/NRO
NAME	DBeaulieu	CHawes CMH	MMurphy	TMcGinty TRQ for	GTracy
DATE	08/06/09	08/11/09	08/14/09	8/17/09	08/12/09

OFFICIAL RECORD COPY