

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION
WASHINGTON, D.C. 20555-0001

January 28, 2002

NRC INFORMATION NOTICE 2002-07: USE OF SODIUM HYPOCHLORITE FOR
 CLEANING DIESEL FUEL OIL SUPPLY TANKS

Addressees

All holders of operating licenses for nuclear power except those who have 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 alert addressees to the potential problems related to the use of sodium hypochlorite solutions for cleaning diesel fuel oil supply tanks. Use of this chemical in higher concentrations can cause the release of significant amounts of chlorine gas. The NRC anticipates that recipients will review the information for applicability to their facilities and consider taking appropriate actions. However, suggestions contained in this IN do not constitute NRC requirements; therefore, no specific action or written response is required.

Background

Nuclear plants are required to design and maintain an onsite electric power system in accordance with Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR Part 50). One acceptable method for complying with these regulations for fuel oil systems for standby diesel generators is described in Regulatory Guide 1.137, "Fuel Oil Systems for Standby Diesel Generators."

Position 2.f of Regulatory Guide 1.137 recommends that licensees clean fuel oil supply tanks at least every 10 years and that they use sodium hypochlorite solutions or equivalent rather than soap or detergents to avoid introducing surfactants (surface active agents) into the fuel system. However, the use of sodium hypochlorite in higher concentrations can release appreciable amounts of heat and chlorine gas.

Discussion

Sodium hypochlorite is generally available in two forms: as a commercial solution containing 12 to 15 trade percent available chlorine (a so-called bleaching solution), and as a household solution containing 5 trade percent chlorine. Trade percent is defined as the amount of chlorine, in grams, that is available for each 100 milliliters of sodium hypochlorite solution.

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Sodium hypochlorite is a strong oxidizer and, when mixed with organic materials such as diesel fuel oil, undergoes an exothermic reaction that generates heat and releases chlorine gas, sometimes violently. A solution with a concentration of 12 trade percent available chlorine can produce up to 1 pound of chlorine gas for each gallon of solution that reacts. Since fuel oil supply tanks are usually located underground and cleaning them may involve working in a confined space, this release could be harmful to the cleaning personnel. Licensees should take appropriate precautions to protect personnel.

Regulatory Guide 1.137 states that solutions equivalent to sodium hypochlorite can be used to clean fuel oil supply tanks. The intent is to keep surfactants from soap or detergents out of the tank. Therefore, to prevent personnel injury, other materials with cleaning properties equivalent to sodium hypochlorite can be used to clean fuel oil supply tanks, provided they meet the intent of the recommendation.

The technical specifications of some licensees may include the requirement to use sodium hypochlorite to clean the fuel oil supply tanks. This requirement came from Revision 4 of the Westinghouse standard technical specifications, but has been removed in subsequent revisions. Therefore, any licensee with this requirement has an opportunity to remove it by submitting a license amendment request. Alternatively, when a licensee converts to the improved technical specifications, the cleaning requirement is moved, along with the other fuel oil requirements, to a fuel oil program. Any licensee that has the requirement in a fuel oil program can change it under 10 CFR 50.59.

This information notice requires no specific action or written response. If you have any questions about the information in this notice, please contact one of the technical contacts listed below or the appropriate Office of Nuclear Reactor Regulation (NRR) project manager.

/RA/

William D. Beckner, Program Director
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NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
2002-06	Design Vulnerability in BWR Reactor Vessel Level Instrumentation Backfill Modification	01/18/2002	All holders of operating licenses or construction permits for boiling water reactors (BWRs).
2002-05	Foreign Material in Standby Liquid Control Storage Tanks	01/17/2002	All holders of licenses for nuclear power reactors.
2002-04	Wire Degradation at Breaker Cubicle Door Hinges	01/10/2002	All holders of operating licenses for nuclear power reactors.
2002-03	Highly Radioactive Particle Control Problems During Spent Fuel Pool Cleanout	01/10/2002	All holders of operating licenses for nuclear power reactors, holders of licenses for permanently shutdown facilities with fuel onsite, and holders of licenses for non-power reactors.
2002-02	Recent Experience with Plugged Steam Generator Tubes	01/08/2002	All holders of operating licenses for pressurized-water reactors (PWRs), except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor.
2002-01	Metalclad Switchgear Failures and Consequent Losses of Offsite Power	01/08/2002	All holders of licenses for nuclear power reactors.
2001-19	Improper Maintenance and Reassembly of Automatic Oil Bubblers	12/17/2001	All holders of operating licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.