



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DEC 28 1990

TO: ALL OPERATORS OF LOW-LEVEL RADIOACTIVE WASTE (LLW) DISPOSAL SITES,
WASTE PROCESSORS, AND ALL HOLDERS OF LICENSES FOR
NUCLEAR FUELS, NUCLEAR MATERIALS AND NUCLEAR POWER REACTORS

SUBJECT: REPORTING MISHAPS INVOLVING LLW FORMS PREPARED FOR DISPOSAL
(GENERIC LETTER 91-02)

Purpose:

For the reasons presented below, the Nuclear Regulatory Commission (NRC) has decided to rely on voluntary submittal of informational reports by both waste form generators and processors regarding mishaps to LLW forms prepared for disposal. This Generic Letter is intended to encourage this action on such mishaps. Licensees are also reminded of their obligation to report defects and deviations in accordance with NRC requirements in 10 CFR Part 21.

Discussion:

Background -

NRC has incomplete information on mishaps to LLW forms prepared for disposal. Four incidents have been reported in which pressurization resulted from chemical reactions in LLW shipping containers storing dewatered synthetic organic materials, such as resins (NRC Information Notices 83-14, "Dewatered Spent Ion Exchange Resin Susceptibility to Exothermic Chemical Reaction," March 21, 1983; 84-72, "Clarification of Conditions for Waste Shipments Subject to Hydrogen Gas Generation," September 10, 1984; 90-50, "Minimization of Methane Gas in Plant Systems and Radwaste Shipping Containers," August 8, 1990). Another incident was reported in which, during solidification of the waste, a violent reaction occurred between a chemical detergent and a vendor's waste solidification agent (NRC Information Notice 88-08, "Chemical Reactions with Radioactive Waste Solidification Agents," March 14, 1988). This reaction resulted in boiling of the mixture so that it overflowed the liner, then hardened, and had to be chipped away. Other problems have been encountered in the use of cement to solidify and stabilize bead resin wastes. Thus, there have been multiple incidents in which cement-solidified bead resin wastes have either not solidified properly or have disintegrated over a period of time after solidification. Although mishaps such as these generally have been made known to regulatory authorities, mainly through indirect and informal means, there is presently no established method to encourage the reporting of such events and the providing of adequate information on them.

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Current Practice -

All three currently-sited Agreement States (Nevada, South Carolina, and Washington) have established requirements in the State licenses for the reporting of waste form and container deficiencies identified by the site operators in wastes shipped to the sites for disposal. In addition, all three facilities have on-site State inspectors who inspect the condition of shipments received by the disposal-facility operators. This information is provided to NRC as part of the NRC/Agreement State exchange of information program. The staff further notes, however, that neither the Agreement States nor NRC have specific regulatory requirements that apply to all licensees for reporting of waste form or container deficiencies. Therefore, the States do report what they find, but they may not find some of these problems, because they have no requirement to look for all such events at their disposal facilities, and they do not presently have the means to be informed routinely of mishaps that occur at NRC-licensed facilities.

Existing reporting requirements contained in 10 CFR 20.403, 50.72, 50.73 and 61.80 do not require reporting of waste form mishap information. The reporting requirement in 10 CFR Part 21 is associated with safety-significant defects or noncompliances, and may not be interpreted by some to cover mishap information.

Classes of Needed Information -

The staff has identified three classes of useful information that interest NRC and could be reported. These three include:

1. The failure of high-integrity containers used to ensure a stable waste form. Container failure can be evidenced by changed container dimensions, cracking, or damage resulting from mishandling (e.g., dropping or impacting against another object).
2. The misuse of high-integrity containers, evidenced by a quantity of free liquid greater than 1 percent of container volume, or by an excessive void space within the container. Such misuse is prohibited by 10 CFR 61.56.
3. The production of a solidified Class B or C waste form that has any of the following characteristics:
 - Contains free liquid in quantities exceeding 0.5 percent of the volume of the waste.
 - Contains waste with radionuclides in concentrations exceeding those considered during waste form qualification testing accepted by the regulatory agency, which could lead to errors in assessment of waste class.

- Contains a significantly different waste loading than that used in qualification testing accepted by the regulatory agency.
- Contains chemical ingredients not present in qualification testing accepted by the regulatory agency, and those quantities are sufficient to unacceptably degrade the waste product.
- Shows instability evidenced by crumbling, cracking, spalling, voids, softening, disintegration, nonhomogeneity, or dimensional changes.
- Evidence of processing phenomena that exceed the limiting processing conditions identified in applicable topical reports on process control plans, e.g., foaming, temperature extremes, premature or slow hardening, and production of volatile material.

Bases for Needed Information -

The voluntary reporting of the three classes of information outlined above would allow the staff access to information on field experiences with LLW forms and to determine when modifications to test criteria are necessary. 10 CFR Part 61 establishes certain "minimum" (61.56(a)) and "stability" (61.56(b)) requirements for LLW, whereas Part 20 (Section 20.311) requires waste generators and processors to certify that the waste satisfied the requirements of Part 61. The Nuclear Material Safety and Safeguards (NMSS) staff reviews topical reports and other documents provided by vendors and licensees to ensure that the waste-form requirements of Part 61 will be met and to provide a vehicle with which the certification requirements of Part 20 can be satisfied (by reference). In a parallel effort, the Office of Nuclear Reactor Regulation (NRR) staff reviews information on waste-processing equipment and procedures to ensure that 10 CFR Part 50, App. A, "General Design Criteria for Nuclear Power Plants," is satisfied. The NRC staff findings of acceptability and adequacy of process-control provisions affecting the characteristics of the waste-form produced may require modification, if subsequent experience in the field reveals that the bases for the approvals are being exceeded or are no longer relevant. Therefore, to make informed decisions on regulatory action, to inform licensees of events that may have generic implications, and to make inspectors aware of the reported information, the staff needs to have quantitative information on the nature and frequency of occurrence of mishaps regarding waste form and packaging for disposal.

It is suggested that the voluntary submittal of information regarding waste-form mishaps be reported within 30 days of the incident to NRC's Director of the Division of Low-Level Waste Management and Decommissioning and to the designated State disposal-site regulatory authority.

This request is covered by Office of Management and Budget Clearance Number: 3150-0156, which expires November 30, 1993. The estimated average burden is approximately 8 person-hours per licensee response, including visual observation of the waste form mishap, drafting a description of the observation, and preparing a final mishap report for submittal to NRC. Comments on the accuracy of this estimate and suggestions to reduce the burden may be directed to the Office of the Management and Budget, Room 3208, New Executive Office Building, Washington, D.C. 20503, and the U.S. Nuclear Regulatory Commission, Information and Records Management Branch, Office of Information Resources Management, Washington, D.C. 20555.

If you have any questions about this letter, please direct them to the technical contact listed below or to the appropriate regional office.

Sincerely,



Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

Technical Contact: Michael Tokar, NMSS
(301) 492-0590

Enclosure:
List of Recently Issued Generic Letters

LIST OF RECENTLY ISSUED GENERIC LETTERS

Generic Letter No.	Subject	Date of Issuance	Issued To
91-01	REMOVAL OF THE SCHEDULE FOR THE WITHDRAWAL OF REACTOR VESSEL MATERIAL SPECIMENS FROM TECHNICAL SPECIFICATIONS	01/04/91	ALL HOLDERS OF OLs OR CPs FOR NUCLEAR POWER PLANTS
90-09	ALTERNATIVE REQUIREMENTS FOR SNUBBER VISUAL INSPECTION INTERVALS AND CORRECTIVE ACTIONS	12/11/90	ALL LIGHT-WATER REACTOR LICENSEES AND APPLICANTS
89-10 SUPP. 3	CONSIDERATION OF THE RESULTS OF NRC-SPONSORED TESTS OF MOTOR-OPERATED VALVES	10/25/90	ALL LICENSEES OF OPERATING NUCLEAR POWER PLANTS AND HOLDERS OF CONSTRUC- TION PERMITS FOR NUCLEAR POWER PLANTS
90-08	SIMULATION FACILITY EXEMPTIONS	08/10/90	ALL HOLDERS OF OPERATING LICENSES OR CONSTRUCTION PERMITS FOR NUCLEAR POWER REACTORS
90-07	OPERATOR LICENSING NATIONAL EXAMINATION SCHEDULE	08/10/90	ALL POWER REACTOR LICENSEES AND APPLICANTS FOR AN OPERATING LICENSE
89-10 SUPP. 2	AVAILABILITY OF PROGRAM DESCRIPTIONS	08/03/90	ALL LICENSEES OF OPERATING NPPs AND HOLDERS OF CPs FOR NPPs
88-20 SUPP. 3	COMPLETION OF CONTAINMENT PERFORMANCE IMPROVEMENT PROGRAM AND FORWARDING OF INSIGHTS FOR USE IN THE INDIVIDUAL PLANT EXAMINA- TION FOR SEVERE ACCIDENT VULNERABILITIES	07/06/90	ALL LICENSEES HOLD- ING OLs AND CPs FOR NPP FACILITIES EXCEPT LICENSEES FOR BWRs WITH MARK I CONTAINMENTS
90-06	RESOLUTION OF GI 70, "POWER- OPERATED RELIEF VALVE AND BLOCK VALVE RELIABILITY," AND GI 94, "ADDITIONAL LOW- TEMPERATURE OVERPRESSURE PROTECTION FOR LIGHT-WATER REACTORS," PURSUANT TO 10CFR50.54(f)	06/28/90	ALL PRESSURIZED WATER REACTOR LICENSEES AND CONSTRUCTION PERMIT HOLDERS

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Sincerely,

ORIGINAL SIGNED BY

Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

Technical Contract: Michael Tokar, NMSS
(301) 492-0590

Enclosure:
List of Recently Issued Generic Letters

EDO #90-229 (EDO WITS NO. 9000104)

Distribution:	Central File#	NMSS r/f	LLWM r/f	EWick
EKraus	RECunningham	CERossi	MTokar	JSurmeier
JGreeves	RBangart	PLohaus	R.O'Connell	DMorris, EDO
CJenkins		LLWD t/f	LLUR r/f	EDO r/f

PDR YES ☒ NO ☐ Category: Proprietary ☐ or CF Only ☐

ACNW YES ☐ NO ☐

ABSTRACT SUBJECT: REPORTING MISHAPS INVOLVING LLW FORMS PREPARED FOR
DISPOSAL (GENERIC LETTER 91-02)

*SEE PREVIOUS CONCURRENCE

OFC :LLWM*	:TEDITOR*	:IMNS*	:LLWM*	:LLWM*	:LLWD*	:LLWD*
NAME:EWick*	:EKraus*	:RCunningham*	:MTokar	:JSurmeier	:JGreeves	:RBangart
DATE:10/19/90	:10/22/90	:10/31/90	:12/27/90	:12/28/90	:12/28/90	:12/28/90
GENERIC LTR 91-02		OFFICIAL RECORD COPY				

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If you have any questions about this letter, please direct them to the technical contact listed below or to the appropriate regional office.

Sincerely,

(SIGNED) RICHARD L. BANGART

Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

Technical Contact: Michael Tokar, NMSS
(301) 492-0590

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OFC :LLTB	TECHEDIT :IMNS	:LLTB <i>Eau</i>	:LLTB <i>for</i>	:LLWM <i>for</i>	:LLWM <i>for</i>
NAME:EWick*	:EKraus*	:RCunningham*	:MTokar	:JSurmeier	:JGreeves :RBangart
DATE:10/19/90	:10/22/90	:10/31/90	:12/27/90	:12/28/90	:12/28/90 :12/28/90

~~GENERIC LETTER 90-XX~~ (as attachmt to doc "CRGR") OFFICIAL RECORD COPY

It is requested that waste-form mishaps be reported within 30 days of knowledge of the incident to NRC's Director of the Division of Low-Level Waste Management and Decommissioning and to the designated State disposal-site regulatory authority.

This request is covered by Office of Management and Budget Clearance Number: _____, which expires _____. The estimated average burden is approximately 8 person-hours per licensee response, including visual observation of the waste form mishap, drafting a description of the observation, and preparing a final mishap report for submittal to NRC. Comments on the accuracy of this estimate and suggestions to reduce the burden may be directed to the Office of the Management and Budget, Room 3208, New Executive Office Building, Washington, D.C. 20503, and the U.S. Nuclear Regulatory Commission, Information and Records Management Branch, Office of Information Resources Management, Washington, D.C. 20555.

If you have any questions about this letter, please direct them to the technical contact listed below or to the Regional Administrator of the appropriate regional office.

Sincerely,

Richard L. Bangart, Director
Division of Low-Level Waste Management
and Decommissioning, NMSS

Technical Contract: Michael Tokar, NMSS
(301) 492-0590

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SUBJECT ABSTRACT:				

OFC :LLTB	TECH EDIT :IMNS	:NRR/DOEA:LLTB	:LLTB	:LLWM	:LLWM
NAME:EWick	EKraus	RECunningham	CERossi	MTokar	JSurmeier:JGreeves:RBangart
DATE:10/19/90	10/22/90	10/31/90	10/ /90	10/ /90	10/ /90:10/ /90:10/ /90

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by Telecopy
subject to changes
(which were made)