

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

February 5, 1990

NRC INFORMATION NOTICE NO. 90-09: EXTENDED INTERIM STORAGE OF LOW-LEVEL
RADIOACTIVE WASTE BY FUEL CYCLE AND
MATERIALS LICENSEES

Addressees:

All holders of NRC materials licenses.

Purpose:

This information notice provides guidance to fuel cycle and materials licensees on information needed in license amendment requests to authorize extended interim storage of low-level radioactive waste (LLW) at licensed operations. NRC previously provided guidance on storage of LLW at nuclear power plant sites in Generic Letters 81-38 and 85-14. However, until now NRC has not provided similar guidance for fuel cycle and materials licensees who may, for reasons stated below, need to store their LLW for periods longer than in the past. It is expected that recipients will review this information notice, distribute it to management and staff involved with licensed activities, including responsible radiation safety staff, and consider actions, as appropriate, to assure compliance with NRC requirements. No specific written response to this information notice is required.

Description of Circumstances:

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPA) established a series of milestones, penalties and incentives to ensure that States or Regional Compacts make adequate progress toward being able to manage their LLW by 1993. On January 1, 1993, the existing LLW disposal sites are expected to either close or to stop receiving LLW from outside their Regional Compacts. What this means to licensees who generate LLW is that, unless their State or Regional Compact either has a disposal facility operational on January 1, 1993 or has made other arrangements for storage or disposal, such licensees may have to store their LLW onsite until disposal capacity is available. Storage of LLW in accordance with NRC requirements may be necessary for anywhere from several months to several years.

Discussion:

Not all licensees who will need to store LLW onsite will need amendments to their licenses to do so. However, if the possession limits specified in a license need to be increased to allow storage, or if the terms and conditions of a license

9001300424 ZA

IDR-11C

Concurrence

otherwise need to be modified, a licensee will need to apply for a license amendment. Attachment 1 to this notice identifies information which licensees will need to provide to NRC in such amendment requests. This information may also be useful to licensees who will not need license amendments to store waste, as well as to persons considering applying for a license to construct a centralized storage facility to receive waste from others until State or Regional disposal capacity is available. The following considerations are central to extended storage, and are the basis of the information included in Attachment 1.

1. Storage is not a substitute for disposal. Other than storage for radioactive decay, LLW should be stored only when disposal capacity is unavailable and for no longer than is necessary. Licensee planning should consider a specific date by which storage will end and disposal of the LLW will take place.
2. In general, waste should be processed before storage, packaged in a form ready for transport and disposal at the end of the storage period, and clearly labeled in accordance with 10 CFR Subsection 20.203(f) and Section 20.311. Adequacy of the waste form or package may have to be reassessed before disposal.
3. To ensure integrity of packaging and maintenance of waste form, stored waste should be shielded from the elements and from extremes of temperature and humidity.
4. Waste should be stored in an area which allows for ready visual (direct or remote) inspection on a routine basis. Licensees should plan to conduct and document such inspections at least quarterly.
5. Depending on the specific waste involved, licensees may need to have procedures and equipment in place or readily available to repackage the waste, should the need arise.
6. Decomposition and chemical reaction of incompatible waste materials over time can result in gas generation or other reaction products. Licensees should evaluate what they are planning to store and use measures to prevent these reactions. Further, licensees should determine if the need exists for additional ventilation or fire protection/suppression systems.
7. For most waste forms, storage of waste in containers suitable for disposal will not represent a significant increment of direct radiation exposure potential to workers. However, licensees should consider their specific waste and storage plans and determine if additional shielding or other actions are warranted to keep exposures as low as is reasonably achievable (ALARA).
8. Stored waste should be located in a restricted area and secured (e.g., in a locked room) against unauthorized removal for the term of storage.

NRC does not advocate extended storage of LLW, as long as disposal capacity is available to licensees. However, NRC recognizes that storage is allowed for, as an interim measure, in the framework of the LLRWPA, and this guidance is being issued in recognition of that fact. NRC continues to believe that, whenever possible, storage should only be an interim step between activities that generate waste and ultimate disposal of that waste. In the interest of public health and safety, as well as maintaining exposures ALARA, the length of time LLW is placed in storage should be kept to a minimum. Accordingly, NRC's approval of requests by materials and fuel cycle licensees for interim extended storage will generally be for a period of time no greater than five years.

Some licensees will need to store LLW which also contains hazardous waste as specified under the Resource Conservation and Recovery Act, as amended (RCRA). These mixed wastes, as they are called, are regulated both by NRC - for the radioactive component of the waste - and the U.S. Environmental Protection Agency (EPA) - for the hazardous component of the waste. The information and guidance contained in this notice apply to NRC's regulations only. For information on permitting of storage by EPA, licensees should contact the appropriate EPA regional office or, in those States with approved mixed waste programs, the appropriate State regulatory authority.

If you have questions about your State or Regional Compact, a list of contact persons is provided in Attachment 2 of this notice.

Questions on your specific license or general procedures for license amendments and reviews related to extended interim storage should be addressed to the appropriate NRC regional office or, in the case of fuel cycle licensees, to the Division of Industrial and Medical Nuclear Safety in NMSS.

Richard E. Cunningham

Richard E. Cunningham, Director
Division of Industrial and Medical
Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical Contact: George Pangburn, NMSS
(301) 492-0628

Attachments:

1. Information Needed in an Amendment Request to Authorize Extended Interim Storage of LLW.
2. Regional Compacts and Unaffiliated States.
3. List of Recently Issued NMSS Information Notices.
4. List of Recently Issued NRC Information Notices.

**INFORMATION NEEDED IN AN AMENDMENT REQUEST TO AUTHORIZE
EXTENDED INTERIM STORAGE OF LOW-LEVEL RADIOACTIVE WASTE**

The following paragraphs identify the information which NRC considers necessary in an amendment request from a materials or fuel cycle licensee to authorize extended interim storage of low-level radioactive waste (LLW).

1. Identification of Waste to be Stored

- a. Specify any possession limit increases needed for extended interim storage of LLW.
- b. Identify the estimated maximum amount of LLW to be stored, both in terms of volume and activity, by radionuclide.
- c. Characterize the LLW to be stored:
 - (1) Volume of waste by Class (A, B, or C)
 - (2) Physical form of the waste: solid, liquid or gas
 - (3) Waste processing: volume reduction, solidification or other treatment.
 - (4) Additional non-radiological properties of LLW (if any): hazardous, biologic/pathogenic, corrosive, flammable, etc.
- d. Describe the amount and type of LLW currently being stored or processed.
- e. Identify any additional permits or approvals necessary for storage (i.e., EPA hazardous waste permit, State or local approvals, etc.) and the status of each required approval.

2. Plans for Final Disposal

- a. Specify when disposal capacity will no longer be available to you and onsite storage will begin.
- b. Specify the State/Regional disposal facility to be used for ultimate disposal of your LLW and when that facility is scheduled to begin accepting LLW. Your Regional Compact or State LLW authority should be able to provide this information if you do not have it.
- c. Specify when you will begin shipping LLW to that facility and how long it will take for your estimated storage inventory to be moved out.

3. Physical Description of Storage Area

- a. Identify the location and provide a diagram of the LLW storage area which demonstrates where packages will be stored and how packages will be accessible for inspection purposes. Include the locations of waste processing equipment (if applicable), air sampling stations, effluent filters and any sources of flammable or explosive material.
- b. Specify the maximum volume of LLW that can be stored in the proposed waste storage area and relate this to annual volume of waste generated.
- c. Specify the type of building/structure in which the waste will be stored and demonstrate that the waste will be protected from weather at all times.
- d. Describe the measures to control access to the LLW storage area and thereby ensure security of the waste.
- e. Describe the ventilation system and how it will assure adequate ventilation of the storage area.
- f. Describe the fire protection and suppression system to minimize the likelihood and extent of fire.
- g. Describe how the adverse effects of extremes of temperature and humidity on waste and waste containers will be avoided.
- h. Describe vulnerability to other hazards such as tornado, hurricane, flood, industrial accident, etc.

4. Packaging and Container Integrity

- a. Describe the packages or containers to be used for storage of LLW, any hazards the waste may pose to their integrity, and the projected storage life of the packages or containers.
- b. Describe your program for periodic inspections of LLW packages to ensure that they retain their integrity and containment of LLW.
- c. Describe your program and equipment (if applicable) for remote handling and/or repackaging damaged or leaking waste containers.

5. Radiation Protection

- a. Describe your program for safe placement and inspection of waste in storage and maintaining occupational exposures as low as is reasonably achievable (ALARA). This program should include periodic radiation and contamination surveys of individual packages and the storage area in general, as well as posting the storage area in accordance with 10 CFR Section 20.203.

- b. Describe projected exposure rates, needs for shielding (if any) and any changes in personnel monitoring which will be required as a result of waste storage.
- c. Describe your procedures for responding to emergencies, including notification of and coordination with local fire, police and medical departments.
- d. Describe your system for maintaining accurate records of waste in storage (including any waste receipts or transfers from or to other licensees) to assure accountability.

6. Training

- a. Describe your program for training personnel in procedures for packaging, handling, placement, inspection, surveying and emergency response for LLW storage.

7. Financial Assurance

- a. Review the relevant sections of Parts 30, 40 and 70 regarding financial assurance for decommissioning. If your proposed maximum possession limits exceed the limits specified in Sections 30.35, 40.36 or 70.25, submit with your amendment request a decommissioning funding plan or certification of financial assurance, as appropriate. In either case, this submittal should demonstrate that financial resources are or will be in place not only to decommission the licensed operation, but also to provide for the estimated costs of handling, transport and ultimate disposal of all LLW stored onsite.

8. Emergency Preparedness

- a. Review the relevant sections of Parts 30, 40 and 70 regarding emergency preparedness. If your proposed maximum possession limits exceed the limits specified in Subsections 30.32 (i)(1), 40.31(j)(1) or 70.22 (i)(3), you will be required to either demonstrate that an emergency plan is not needed or to develop and maintain a plan that meets the requirements of the aforementioned sections.

REGIONAL COMPACTS AND UNAFFILIATED STATES

The following is a list of the existing Regional LLW Compacts and unaffiliated States. The list includes a contact person at either the Compact or State level, if you have questions about LLW disposal. In addition, each Regional Compact is further divided to show its member States.

1. Non-sited Regional Compacts*

Appalachian Compact

Mark McClellan
Deputy Secretary for Environmental
Protection
Department of Environmental Resources
Commonwealth of Pennsylvania
P.O. Box 2063
Harrisburg, PA 17120
717/787-5028

(Member States are Pennsylvania [host State], Delaware, Maryland and West Virginia.)

Central Interstate Compact

Ray Peery
Executive Director
Central Interstate Low-Level
Radioactive Waste Compact
3384 Peachtree Road NE, Suite 260
Atlanta, GA 30326
404/261-7114

(Member States are Nebraska [host State], Arkansas, Kansas, Louisiana, and Oklahoma.)

Central Midwest Compact

Clark Bullard
Chair, Central Midwest Compact Commission
Director, Office of Energy Research
University of Illinois
901 South Matthews
Urbana, IL 61801
217/333-7734

(Member States are Illinois [host State] and Kentucky.)

Midwest Compact

Gregg Larson
Executive Director
Midwest Low-Level Radioactive Waste
Compact Commission
350 North Robert, Room 588
St. Paul, MN 55101
612/293-0126

(Member States are Michigan [host State], Iowa, Indiana, Minnesota, Missouri, Ohio and Wisconsin.)

Northeast Compact

Denise Drace
Executive Director
Northeast Interstate Radioactive
Waste Compact Commission
195 Nassau Street, 2nd Floor
Princeton, NJ 08540
609/497-1447

(Member States are Connecticut and New Jersey, both of which are host States.)

Southwestern Compact

Don Womeldorf
Chief, Environmental Management Branch
Department of Health Services
State of California
714 P Street, Room 616
Sacramento, CA 95814
916/445-0498

(Member States are California [host State], Arizona, North Dakota and South Dakota.)

2. Sited Regional Compacts**

Northwest Compact

Elaine Carlin
Executive Director
Northwest Compact Commission
Department of Ecology
State of Washington
Mail Stop PV-11
Olympia, WA 98504
206/459-6244

(Member States are Washington [host State], Alaska, Hawaii, Idaho, Montana, Oregon and Utah.)

Rocky Mountain Compact

Leonard Slosky
Executive Director
Rocky Mountain Compact Commission
1675 Broadway, Suite 1400
Denver, CO 80202
303/825-1912

(Member States are Nevada [current host State], Colorado, New Mexico and Wyoming.)

Southeast Compact

Kathy Visocki
Executive Director
Southeast Compact Commission
3901 Barrett Drive, Suite 100
Raleigh, NC 27609
919/781-7152

(Member States are South Carolina
[current host State], Alabama,
Florida, Georgia, Mississippi, North
Carolina, Tennessee and Virginia.)

3. Unaffiliated States***

District of Columbia

Frances Bowie
Administrator
Service Facility Regulation
Administration
Department of Consumer and
Regulatory Affairs
District of Columbia
614 H Street, NW, #1014
Washington, D.C. 20001
202/727-7190

Maine

Matthew Scott
Executive Director
Low-Level Radioactive Waste Siting
Authority
State of Maine
99 Western Avenue, Suite 101
Augusta, ME 04330
207/626-3249

Massachusetts

Carol Amick
Executive Director
Low-Level Radioactive Waste
Management Board
Commonwealth of Massachusetts
100 Cambridge, 20th Floor
Boston, MA 02202
617/727-9800

New Hampshire

Bryan Stromh
Deputy Director
Public Health Services Division
Department of Environmental Services
State of New Hampshire
6 Hazen Drive
Concord, NH 03301
603/271-3503

New York

Jay Dunkelberger
Executive Director
Low-Level Radioactive Waste Siting
Commission
State of New York
1215 Western Avenue, Suite 306
Albany, NY 12203
518/438-6130

Puerto Rico

Santos Rohena
Chair
Environmental Quality Board
Commonwealth of Puerto Rico
P.O. Box 11488
San Turce, Puerto Rico 00910
809/725-5140

Rhode Island

Victor Bell
Chief
Office of Environmental Coordination
Department of Environmental Management
State of Rhode Island
9 Hayes Street
Providence, RI 02908
401/277-3434

Vermont

Jonathan Lash
Secretary
Agency of Natural Resources
State of Vermont
103 South Main
Waterbury, VT 05676
802/244-7347

Texas

Lawrence R. Jacobi
General Manager
Low-Level Radioactive Waste Disposal
Authority
State of Texas
7701 North Lamar Boulevard, #300
Austin, TX 78752
512/451-5292

* Non-sited Regional Compacts are those Compacts of States approved by Congress that do not currently have an operational LLW disposal facility.

** Sited Regional Compacts are those Compacts of States approved by Congress that do have an operational LLW disposal facility.

*** Unaffiliated States are those States that are not a member of a Regional Compact and that are pursuing LLW disposal capacity or other LLW disposal arrangements independently.

LIST OF RECENTLY ISSUED
NMSS INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
90-01*	Importance of Proper Response to Self-Identified Violations by Licensees	01/12/90	All holders of NRC materials licenses.
89-85	EPA's Interim Final Rule on Medical Waste Tracking and Management	12/15/89	All medical, academic, industrial, waste broker, and waste disposal site licensees.
89-82	Recent Safety-Related Incidents at Large Irradiators	12/07/89	All U.S. NRC licensees authorized to possess and use sealed sources at large irradiators.
89-78	Failure of Packing Nuts on One-Inch Uranium Hexafluoride Cylinder Valves	11/22/89	All U.S. NRC licensees authorized to possess and use source material and/or special nuclear material for the heating, emptying, filling, or shipping of uranium hexafluoride in 30- and 48-inch diameter cylinders.
89-60	Maintenance of Teletherapy Units	08/18/89	All U.S. NRC Medical Teletherapy Licensees.
89-47	Potential Problems with Worn or Distorted Hose Clamps on Self-Contained Breathing Apparatus	05/18/89	All holders of operating licenses or construction permits for nuclear power reactors and fuel facilities.
89-46	Confidentiality of Exercise Scenarios	05/11/89	All holders of licenses for fuel cycle facilities and byproduct material licensees having an approved emergency response plan.

*Correct Nudocs Accession Number for 90-01 should be 9001080145

LIST OF RECENTLY ISSUED
 NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
88-30, Supplement 1	Target Rock Two-Stage SRV Setpoint Drift Update	2/2/90	All holders of OLs or CPs for nuclear power reactors.
90-08	Kr-85 Hazards from Decayed Fuel	2/1/90	All holders of OLs or CPs for nuclear power reactors and holders of licenses for permanently shut-down facilities with fuel on site.
88-23, Supp. 2	Potential for Gas Binding of High-Pressure Safety Injection Pumps During a Loss-of-Coolant Accident	1/31/90	All holders of OLs or CPs for PWRs.
90-07	New Information Regarding Insulation Material Performance and Debris Blockage of PWR Containment Sumps	1/30/90	All holders of OLs or CPs for nuclear power reactors.
90-06	Potential for Loss of Shutdown Cooling While at Low Reactor Coolant Levels	1/29/90	All holders of OLs or CPs for nuclear power reactors.
90-05	Inter-System Discharge of Reactor Coolant	1/29/90	All holders of OLs or CPs for nuclear power reactors.
90-04	Cracking of the Upper Shell-to-Transition Cone Girth Welds in Steam Generators	1/26/90	All holders of OLs or CPs for Westinghouse-designed and Combustion Engineering-designed nuclear power reactors.
90-03	Malfunction of Borg-Warner Bolted Bonnet Check Valves Caused by Failure of the Swing Arm	1/23/90	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
 CP = Construction Permit

- 8. Stored waste should be located in a restricted area and secured (e.g., in a locked room) against unauthorized removal for the term of storage.

NRC does not advocate extended storage of LLW, as long as disposal capacity is available to licensees. However, NRC recognizes that storage is allowed for, as an interim measure, in the framework of the LLRWPA, and this guidance is being issued in recognition of that fact. NRC continues to believe that, whenever possible, storage should only be an interim step between activities that generate waste and ultimate disposal of that waste. In the interest of public health and safety, as well as maintaining exposures ALARA, the length of time LLW is placed in storage should be kept to a minimum. Accordingly, NRC's approval of requests by materials and fuel cycle licensees for interim extended storage will generally be for a period of time no greater than five years.

Some licensees will need to store LLW which also contains hazardous waste as specified under the Resource Conservation and Recovery Act, as amended (RCRA). These mixed wastes, as they are called, are regulated both by NRC - for the radioactive component of the waste - and the U.S. Environmental Protection Agency (EPA) - for the hazardous component of the waste. The information and guidance contained in this notice apply to NRC's regulations only. For information on permitting of storage by EPA, licensees should contact the appropriate EPA regional office or, in those States with approved mixed waste programs, the appropriate State regulatory authority.

If you have questions about your State or Regional Compact, a list of contact persons is provided in Attachment 2 of this notice.

Questions on your specific license or general procedures for license amendments and reviews related to extended interim storage should be addressed to the appropriate NRC regional office or, in the case of fuel cycle licensees, to the Division of Industrial and Medical Nuclear Safety in NMSS.

Richard E. Cunningham, Director
Division of Industrial and Medical
Nuclear Safety, NMSS

Technical Contact: George Pangburn, NMSS
(301) 492-0628

Attachments:

- 1. Information Needed in an Amendment Request to Authorize Extended Interim Storage of LLW.
- 2. Regional Compacts and Unaffiliated States.
- 3. List of Recently Issued NMSS Information Notices.
- 4. List of Recently Issued NRC Information Notices.

OGC*
RFonner
1/24/90

[Handwritten signature]
1/25/90

*See previous concurrence

OFFC: IMOB* : IMOB* : IMOB* : NMSS* : LLWM* : IMNS : IMNS
 NAME: GPangburn/mk:CTrottier : JHickey : EKraus : RBangart: GSJobbom : RECunningham
 DATE: 01/23/90 : 01/23/90 : 01/23/90:01/24/90 : 01/24/90:01/26/90 : 01/26/90

- 8. Stored waste should be located in a restricted area and secured (e.g., in a locked room) against unauthorized removal for the term of storage.

NRC does not advocate extended storage of LLW, as long as disposal capacity is available to licensees. However, NRC recognizes that storage is allowed for, as an interim measure, in the framework of the LLRWPA, and this guidance is being issued in recognition of that fact. NRC continues to believe that, whenever possible, storage should only be an interim step between activities that generate waste and ultimate disposal of that waste. In the interest of public health and safety as well as maintaining exposures ALARA, the length of time LLW is placed in storage should be kept to a minimum. Accordingly, NRC's approval of requests by materials and fuel cycle licensees for interim extended storage will generally be for a period of time no greater than five years.

Some licensees will need to store LLW which also contains hazardous waste as specified under the Resource Conservation and Recovery Act, as amended (RCRA). These mixed wastes, as they are called, are regulated both by NRC - for the radioactive component of the waste - and the U.S. Environmental Protection Agency (EPA) - for the hazardous component of the waste. The information and guidance contained in this Notice applies to NRC's regulations only. For information on permitting of storage by EPA, licensees should contact the appropriate EPA Regional Office or, in those States with approved mixed waste programs, the appropriate State regulatory authority.

If you have questions regarding your State or Regional Compact, a list of contact persons is provided in Attachment 2 to this Notice.

Questions regarding your specific license or general procedures for license amendments and reviews related to extended interim storage should be addressed to the appropriate NRC Regional Office or, in the case of fuel cycle licensees, to the Division of Industrial and Medical Nuclear Safety in NMSS.

Richard E. Cunningham, Director
Division of Industrial and Medical
Nuclear Safety, NMSS

Technical Contact: George Pangburn, NMSS
(301) 492-0628

Attachments:

- 1. Information Needed in an Amendment Request to Authorize Extended Interim Storage of LLW.
- 2. Regional Compacts and Unaffiliated States.
- 3. List of Recently Issued NMSS Information Notices.
- 4. List of Recently Issued NRC Information Notices.

R.E.C.
R. Turner
1/24/90

OFFC: IMOB : IMOB : IMOB : NMSS : LLW : IMNS : IMNS
 NAME: GPangburn/mk : CTrotter : JHickey : EKreus : RBangart : GSJoblom : RECunningham
 DATE: 01/23/90 : 01/23/90 : 01/23/90 : 01/24/90 : 01/24/90 : 01/ /90