LLW notes

Volume 39 Number 2 March - April 2024

A Message from Dan Shrum, Executive Director

Thanks to everyone who participated in person and virtually during the Spring 2024 Forum meeting held in Orlando, FL. Please send me feed back on both the hotel venue and/or the virtual portion of the meeting. Also, if you have any recommendations for speakers at our next meeting, please let me know.

Daniel B. Shrum, Executive Director

Please submit comments, suggestions or articles for the LLW *notes* to margaretllwf@gmail.com

In this Issue...**Find the Forum Board's focus, highlights of the Forum's Spring Meeting, along with compact and regional news.**

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Margaret Henderson, Editor

About LLW Forum

LLW Forum, established to facilitate state and compact implementation of the Low-Level Radioactive Waste Policy Amendments Act of 1985, promotes the objectives of the low-level radioactive waste regional compacts. LLW Forum provides opportunity for state and compact officials to share information with each other and to exchange views with officials of federal agencies and other interested parties.

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Acronyms Used in **LLW *notes***

CFR	Code of Federal Regulations
CRCPD	Conference of Radiation Control Program Directors
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EPA	U.S. Environmental Protection Agency
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiation Protection
LLWF	Low-Level Waste Forum
NARM	Naturally occurring and accelerator produced radioactive material
NCRP	National Council on Radiation Protection and Measurements
NORM	Naturally occurring radioactive material
NRC	U.S. Nuclear Regulatory Commission
OAS	Organization of Agreement States
TENORM	Technologically enhanced naturally occurring radioactive material

Contents

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Forum Corner

Board Focus

Thanks to the Southeast Compact for sponsoring the meeting. Attendees please provide comments on the meeting to Dan or one of the officers or fill out the survey that was recently sent out by Cecilia available at https://www.surveymonkey.com/r/LLWFSpring24Survey

Torch Passing: Tom Hansen, LLW Forum Chair and Executive Director, Southeast Compact, will become Past-Chair. Doug Hansen of Utah will become Chair.

All presentations from the meeting will be on our website: https://llwforum.org/presentations/

Part 61 – The Forum will be asking for volunteers to join this committee.

Exportation between Compacts Work Group - Stephen Raines: Texas/Vermont Compact is working on a rule change to address those issues between compacts and to provide greater disclosure on what is coming in and out of Texas.

Mission & Operations Committee

- Previous focus on overall transition in the Forum and work on mission statement have been completed.
- M&O is looking for ideas for its next study.
- The Executive Director contract was extended to a three-year interval.
- Officer terms were changed to one year from two, hoping to get more people to serve.
- Past-Chair runs the agenda committee, so Tom Hansen will be responsible for working on agendas with Dan.

LLW Forum Meeting Dates

Fall 2024 LLW Forum Meeting
October 9-10, 2024
Reno, NV

Spring 2025 LLW Forum Meeting
April 9-10, 2025
Odessa, TX

Tour of Urenco and WCS
April 8, 2025

DSWG Update April 2024

by Michael Klebe

The Disused Sources Working Group (DSWG) met following the LLW Forum meeting on April 5, 2024, in Orlando, FL. The hybrid meeting was well attended both in-person and virtually.

Pilot study related to adding IAEA Category 3 sealed sources to the National Source Tracking System (NSTS)

The DSWG has not been successful yet in finding an Agreement State partner to participate in a pilot study related to adding IAEA Category 3 sealed sources to the National Source Tracking System (NSTS). Based on discussions at the meeting, the DSWG is simplifying the scope of work to remove the task of compiling the source specific information. This will decrease the level of effort required of the Agreement State program partner.

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Forum Corner

DSWG Update – April 2024 - continued

Pilot study related to adding IAEA Category 3 sealed sources to the National Source Tracking System (NSTS) - continued

To date, discussions have been conducted with the States of Illinois, Texas, and Utah. Texas expressed interest in participating. However, given the large size and composition of the Texas program's licensees, it was determined that it may not be easily scalable to the effort of the typical Agreement State Program. By reducing the scope of work, the DSWG hopes that participating in the pilot study may be more acceptable to an Agreement State program. This modification should reduce the level of effort required and result in cost savings. Several productive conversations were held at the Forum meeting with Agreement State programs that may be interested in participating in the study.

Discussion on the work of the Government Accountability Office with Ned Woodward, GAO

The DSWG had a productive discussion on the work of the Government Accountability Office. Ned Woodward, GAO, discussed their recent covert operations that tested the ability of a nefarious actor to secure a radioactive material license, then falsify that license and secure radioactive material. He described the GAO interactions with the NRC Commission and the difficulties encountered in getting GAO recommendations enacted through the rulemaking process.

U.S. NRC's Integrated Rulemaking

The DSWG is following the U.S. NRC's Integrated Rulemaking activities. Ryan Whited, NRC, presented an overview of the Integrated Rulemaking which is an effort to combine the current revision to 10 CFR Part 61 with requirements that would allow for the near-surface disposal of Greater Than Class C waste (GTCC). The NRC hosted a public meeting in January 2024 to solicit input from the public. The staff has completed the regulatory basis which is currently going through management review. The schedule has the regulatory basis released for public review in early 2025. The rulemaking schedule has the proposed rulemaking to the Commission in May 2024. Once the rulemaking is approved for publication, the staff will issue a draft guidance document and conduct public meetings to solicit input. The schedule anticipates the final rule and guidance being published in November 2025. The guidance document will be NUREG-2175, Guidance for Conducting Technical Analyses for Part 61.

Integrated Rulemaking

The Integrated Rulemaking raises the question of DOE responsibility under the Low-Level Radioactive Waste Policy Act for the disposal of GTCC waste. The rulemaking would allow for the near surface disposal of GTCC waste at a commercial LLRW disposal facility or an NRC/Agreement State Program licensed federal facility. If GTCC waste can be disposed of at a commercially operated LLRW disposal facility, then the problem will be solved.

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Forum Corner

DSWG Update – April 2024 - continued

Integrated Rulemaking- continued

However, while WCS has expressed interest in accepting GTCC waste at their federal disposal facility, the State of Texas has expressed opposition to accepting increased concentration and activity and Andrews County passed a resolution opposing the disposal of GTCC at the WCS site. Compounding this is also the concern with foreign origin material. Most all of the americium sources made since 2003 have been made using foreign origin americium. The DSWG discussed ways to reach out to the DOE and NNSA to better understand their plans on providing for the disposal of GTCC waste. Representatives from these agencies will be asked to attend the next LLW Forum and DSWG meetings to discuss the issue.

Southeast Commission offer of additional 30% subsidy of the disposal cost for those sources within the compact region participating in the CRCPD's SCATR program

Finally, as a reminder for those generators in the Southeast Compact, the Southeast Commission is offering an additional 30% subsidy of the disposal cost for those sources within the compact region participating in the CRCPD's SCATR program. The SCATR program provides a 40% cost share for sources disposed through the program. This means that generators in the Southeast Compact will receive a 70% reduction in the cost to dispose of their sources through the SCATR program. More information about the Southeast Compact Commission's program can be found on their website.

From the Spring Meeting Presentation by Michael Klebe

Pilot Study for Adding Cat 3 Sources to NSTS

- DSWG is seeking an Agreement State program partner to evaluate the level of effort associated with adding Cat 3 sources.
- Two phases:
  - Figure out what it will take
  - Do it
- Funding
  - Phase 1 - flat fee
  - Phase 2 – based on estimate generated in phase 1

National Source Tracking System

- In 2008, NRC proposed to add Cat 3 sources to NSTS. Failed on a 2-2 Commission vote.
- DSWG's 2014 report recommended adding Cat 3 sources to the NSTS.
  - #5 –The NRC should expand the NSTS to track Category 3 sources.
- Response received from Agreement States has been the effort is not worth the return without any quantification of the effort involved.

National Source Tracking System

- The NSTS is a secure user-friendly web-based database designed to track Category 1 and 2 radioactive sources.
- Tracking spans the life cycle of the source from manufacture through shipment receipt, decay and burial.
- About 1,300 licensees began reporting Cat 1 and 2 sources in January 2009

Disused Source Problem Contributing Factors

- Life-cycle costs for managing and disposing of sources not internalized
- Inconsistent view of which sources pose a security threat
- Regulatory system inadequacies for a post-9/11 threat environment
- No financial incentive for reuse, recycle, or disposal
- Opportunities for recycling and reusing sources are underutilized
- Type B shipping container availability and cost

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Keynote Speaker

CLARK ELDREDGE
CHIEF , BUREAU OF RADIATION CONTROL
FLORIDA DEPARTMENT OF HEALTH

Calendar Year 2023

168 Shipments inspected
37 Shipments from CR Unit 3 decommissioning
31 Shipments from TP
23 Shipments from Florida State University
21 Shipments from Permafix
17 Shipments from SL
224,819 Cubic feet of waste shipped
126,979 Cubic Feet from CR Unit 3
39,681 Cubic Feet from TP
21,789 Cubic Feet from Permafix

Steam Generator on Rail Car

Program Scope

- 1527 Specific Radioactive Materials Licensees (2nd largest in nation)
- 401 Industrial Licenses
- 1030 Medical Licenses
- 16 Academic Licenses

Two active nuclear power plant sites

- Turkey Point (TP), 30 miles S of Miami in Homestead
- St. Lucie (SL), on S. Hutchinson Island near Ft. Pierce

Crystal River (CR) Unit 3 nuclear power plant in process of decommissioning

Low Level Waste Inspection Program

Includes standard shipment transports, packages, drums, B-25 boxes, Intermodal containers and casks

Also includes material from CR Unit 3 decommissioning including

Reactor Head

Steam Generators

Travails of Low Level Waste Disposal in Florida

1966 - Florida State University applied for and received a Special Use Permit from the USDA to use property in the Apalachicola National Forest as a waste burial site for radioactive contaminated wastes generated at the University.

1967 - Approval from Florida State Board of Health.

1988 - USDA Ground Water Conclusions: Annual analysis of groundwater from monitoring wells has shown that low-level radioactivity has reached perimeter of site.

2018 - Reports identified groundwater plume extends over an estimated area of approximately eight (8) acres. Remediation Costs for Site Groundwater Treatment range from $1M to $19.5M depending on extent of the project. Source removal and off-site disposal phase is complete.

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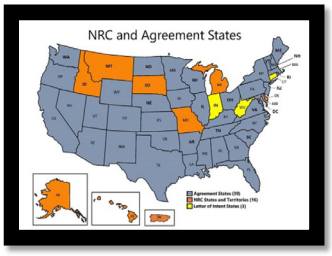
NRC Update
Jane Marshall, Director
Division of Decommissioning, Uranium Recovery, and Waste Programs (DUWP)

Collaboration with Agreement States



IMPEP: Integrated Materials Performance Evaluation Program - LLW

Completed in 2023 (Illinois and Utah)

Reviews in 2024 (Kentucky)

CT will be an Agreement State next year.

Annual NRC/Agreement States LLW Workshop

Exchange of operational experience, challenges, and best practices (November 15, 2023)

Decommissioning Rulemaking

Would implement specific regulatory requirements for different phases of the decommissioning process consistent with the reduced radiological risk.

Final rule package submitted to the Commission January 2024 (SECY-24-0011; ML23258A200)

Next step: Commission review and vote on the final rule

Target: August 2024 for publication date

Decommissioning Trust Fund and Major Radioactive Components During Operations

In 2019, NRC received a petition for rulemaking requesting DTF access to pay for disposal of "major radioactive components" (MRCs) during operations. [Steam generators; reactor pressure heads]

In December 2021, the Commission approved publication of the Federal Register notice denying the petition for rulemaking.

Staff is currently finalizing Interim Staff Guidance (ISG) on this topic and has informed licensees that the final ISG will be published in spring/summer of this year.

...for NRC News and Information

See https://www.nrc.gov/waste/decommissioning/whats-new.html

From the Audience Q&A: Particle Accelerators Policy

The Energy Policy Act includes particle accelerators but they are not "waste," but are they expect to be regulated as waste? Legal questions arise for NRC. The significance is the difference between inputs and processes and results themselves. These are dependent on technology and determinations have not been made yet.

Cleaning Radium Sites

- 3 non-military sites remaining with residual radium activity requiring remediation
- Monitoring or Staying Informed at 3 National Park Service and 17 Department of Defense sites under Comprehensive Environmental Response, Compensation, and Liability Act and Memorandum of Understanding
- Coordinating with other Federal agencies
- Extensive stakeholder outreach to Agreement States with radium sites

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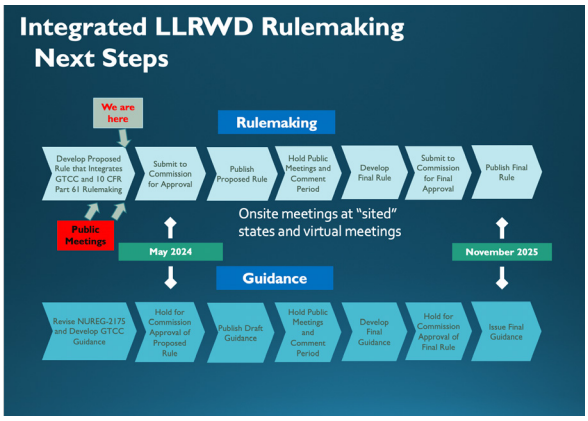
NRC Update - continued

Integrated LLWD Rulemaking

- Proposed changes will remove the limitation that the requirements were developed for particular waste types (concentrations)
- Site-specific technical analyses are risk-informed regulation
- Proposed changes are consistent with domestic and international practice
- Waste with significant quantities of long-lived radionuclides is more challenging to dispose in the near-surface than "traditional" LLW
- Technical requirements must align with the characteristics of the waste
- An Agreement State will have the option whether to regulate GTCC waste; there is no mandate.



Key Issues

- Consolidate and integrate criteria for Greater-Than-Class C (GTCC) and 10 CFR Part 61 rulemaking
- Conduct site-specific analyses for all waste streams including depleted uranium and GTCC waste
- Include graded approach for compliance period
- Include transuranic (TRU) waste in the definition of LLW
- Address physical protection and criticality concerns in GTCC waste streams
- Provide for Agreement State licensing of certain GTCC waste streams

From audience Q & A Comment: May update waste classification tables when rulemaking is finished if needed; this is complicated by statutory requirements so compatibility and implementation will be difficult and take time.

Licensing Waste Processing

In 2023, NRC issued a license to Qal-Tek Associates to perform waste processing at Mayfield Verification Facility.

Financial Assurance for Disposition of Category 1-3 Sources Rulemaking

NRC staff is preparing Regulatory Basis to expand decommissioning financial assurance (DFA) requirements for Category 1 & 2 (and possibly Category 3) byproduct material sealed sources.

Current regulations in 10 CFR 30.35 do not require DFA for many licensees who possess these sources.

Staff is developing and analyzing several potential regulatory options.

Next step: issue Regulatory Basis for public comment in early 2025.

Regulatory basis is being developed in coordination and NSSA of DOE and CRCPD, operators, brokers, distributors and manufacturers. Now considering numbers of sources, risks and what it might cost.

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DOE/EM Waste Management Update
Chris Kemp, Office of Waste Disposal

"While our mission is rooted in the environmental legacy of the past, we are also focused on possibilities for the future. We are looking to the future of EM and our communities."

Greater than Class C (GTCC) LLW Disposal Status

LLW remains in storage at generators' facilities.

DOE monitors NRC regulatory developments, and follows the Energy Policy Act of 2005 requirement to "await action by Congress."

Depleted Uranium (DU)

DOE can ship to selected commercial site(s) if the facility is authorized/licensed to receive DU oxide in addition to DOE's Nevada National Security Site:

- Energy*Solutions* near Clive, Utah
- Waste Control Specialists LLC (WCS) Federal Waste Facility

Multiple shipments by rail in 2023 with first shipment from Portsmouth site and additional shipments from Paducah site.

Waste Disposal

DOE has a "tiered" policy on treatment, storage, and disposal:

"DOE waste shall be treated, stored, and in the case of low-level waste, disposed of at the site where the waste is generated, if practical, or at another DOE facility. If DOE capabilities are not practical or cost effective, exemptions may be approved to allow use of non-DOE facilities for the storage, treatment, or disposal of DOE radioactive waste …"

Sufficient LLW/MLLW disposal capacity exists at DOE and commercial facilities to support the EM cleanup mission.

High-Level Radioactive Waste (HLW) Interpretation

The HLW interpretation allows DOE to dispose of defense reprocessing waste in accordance with its radiological characteristics and not by source or where it came from, i.e., some reprocessing wastes may be classified as not HLW (non-HLW).

The first waste stream analyzed was disposed in September 2020.

The second waste stream decision was announced on July 18, 2023, to dispose of SRS contaminated process equipment at WCS.

EM-HQ continues to actively search for candidate waste streams to apply the HLW Interpretation to advance DOE clean-up mission.

For more information, please see the website at https://www.energy.gov/em/high-level-radioactive-waste-hlw-interpretation

Manifest Information Management System (MIMS)

Public source for manifest data of non-DOE LLW shipped to commercial disposal facilities - to be updated in January 2024.

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Program Updates EPA
Joe Rustick, Ph.D.

Ukraine

Zaporizhzhia Nuclear Power Plant's six reactors are shut down. IAEA is monitoring. EPA would lead domestic response and help with recovery if a problem occurs.

INEX-6

EPA led a multi-agency national tabletop exercise under the NEA International Nuclear Emergency Exercise (INEX) series, with a focus on late-stage recovery phases after a nuclear or radiological accident. Projected waste volumes would exhaust all domestic disposal space available currently. Regarding radioactive waste management, questions are:

Who owns it? Where does it go? Who pays? What's covered and not? Where to put waste during decontamination and remediation? Note: There are 100,000 storage locations resulting from the Fukushima accident.

WIPP

EPA will evaluate the recent request for panels. Public outreach will occur later this year in Carlsbad and Santa Fe, NM.

Phosphogypsum

EPA is evaluating performance with respect to radon emissions of the test road at Mosiac's facility in FA. The road uses phosphogypsum and other mixtures. See EPA web page https://www.epa.gov/radiation/phosphogypsum for details. There has not been a comprehensive Community Impact Study on this topic.

TENORM

Phil Egidi, TENORM expert, retired from service with EPA. Jon Major will take over some responsibilities. A rare earths mineral report will be coming out.

Multi-Agency Radiation Site Survey and Investigations Manual (MARSSIM)

The document is undergoing technical editing and will need approval from four federal agencies. No estimate is reliable at this time, but the hope is to have it issued in 2024.

FGR 16 - Cancer Risk Coefficients for Environmental Exposure to Radionuclides

The report is undergoing peer review by an EPA Science Advisory Board panel of experts. Publication is expected in 2025.

Reexamining Disposal Standards

ANS gave its recommendations for new EPA radioactive waste disposal standards in August 2023 (https://www.ans.org/policy/repositorystandard/) EPA recognizes a need to re-examine and update regulations for nuclear fuel cycle operations and for generic disposal standards.

News

- EPA and DOE have a MOU on deep geologic disposal regarding sharing information and responsibilities for high-level waste and spent fuel.
- Low-Level Waste Production of SMRs EPA is aware and considering the LLW impact of SMRs.

...for EPA News and Information

See https://www.epa.gov/radiation

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DOD - LLRW Program
Michael Kurth, Rock Island Arsenal - Small Reactor

Scope

- Technical Team of 8 Health Physicists (4 are Emergency Essential for Contingency Operations)
- Morris Consolidation Facility (MCF) - Allows In-House Acceptance of Most Types of Radioactive Material for Reuse, Recycle or Disposal
- Rapid Response Capabilities
- Approximately 500 U.S. military bases
- Numerous U.S. military overseas locations
- Military radioactive commodities - 1000s of military radioactive items
- Regulatory licenses
- Army – 60 NRC licenses
- Air Force and Navy – Master Material Licenses
- State of Washington – more than 200 permits renewed annually

Highlights

- DU is being demilitarized now.
- Military is working on recovery and reuse of precious metals.
- Tritium signs and devices (25-30 Ci) – There is an effort to recycle through contracting with outside companies.
- Re-purposing and recycling through DOE Livermore Labs is underway by sending tritium for research.

New Reactors

- USAF in Alaska is working with NRC to have operating reactor at that AFB by 2027, with the intent to replace diesel.
- Virginia is working with the military and DOE.
- DOD is working on micro reactors that can be put on truck and set up and off load and operate within 3 days.
- Developing PEFLE - Portable energy for lasting effects.
- Operating reactor at Idaho National Lab End of 2025 - If that comes to pass, they will take it to a military base in U.S. and test it there.
- Army goal of having 3 SMRs at 2 military installations in U.S. by 2030. Selection process is going on about what SMR to use and what locations.
- The military is looking at power independence – clean, reliable power. Climate change is making this an issue. The goal is to not have to be part of the grid in order to provide power.

Regulatory

- Air Force will be NRC licensed.
- Army will be regulated like Navy—not NRC.

Perma-Fix Florida Operations
Randy Self, Vice-President and General Manager

Started in 1983 at Gainesville and in the mid 90s, started treating nuclear waste.

Shipped 19,347 containers 2023 or about 7.7 M pounds.

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GTCC and Part 61 Rulemaking: What are the actual impacts on states and compacts?
David Carlson President and COO Waste Control Specialists

Will all States have to Assume Responsibility over GTCC?

No, GTCC LLRW disposal is not a State responsibility. However, storage, possession, etc. is already a State responsibility.

42 U.S.C. 2021c. Responsibilities for disposal of low-level radioactive waste

(a)(1) Each State shall be responsible for providing, either by itself or in cooperation with other States, for the disposal of low-level radioactive waste generated within the State (other than by the Federal Government) that consists of or contains class A, B, or C radioactive waste as defined by section 61.55 of title 10, Code of Federal Regulations, as in effect on January 26, 1983;

Will all Agreement States have to Assume Responsibility over GTCC Disposal?

No, Agreement State responsibilities are defined in written agreements between the Agreement State and the Federal NRC. Under 42 U.S.C. 2021(b) Agreements with States, an Agreement State would have to agree to accept and approve any relinquishment of authority by the NRC to regulate the disposal of GTCC, and there would need to be a facility in that State (in existence or proposed) that would meet the requirements of the proposed Part 61.

Compatibility requirement - No

Who is Responsible for GTCC Disposal?

The Federal Government is responsible for the disposal of GTCC under

42 U.S.C. 2021c(b)(1)(D).

(D) any other low-level radioactive waste with concentrations of radionuclides that exceed the limits established by the Commission for class C radioactive waste, as defined by section 61.55 of title 10, Code of Federal Regulations, as in effect on January 26, 1983

Will the Compacts Have Authority Over the Movement of GTCC Consistent with the LLRWPA? Will they over the Disposal?

No, the LLRWPA specifically excludes the Compacts from such authority under 42 U.S.C. 2021d. Regional compacts for disposal of low-level radioactive waste: Except as provided in subparagraph (B), no compact or action taken under a compact shall be applicable to the transportation, management, or disposal of any low-level radioactive waste designated in section 2021c(a)(1)(B)(i)–(iii) of this title. Disposal is a federal responsibility: 42 U.S.C. 2021c(a)(1)(B) ... low-level radioactive waste ... that is—

(i) owned or generated by the Department of Energy;

(ii) owned or generated by the United States Navy as a result of the decommissioning of vessels of the United States Navy; or

(iii) owned or generated as a result of any research, development, testing, or production of any atomic weapon

REFERENCES

- Public Law (as passed by Congress)
- PL 96-573 "Low-Level Radioactive Waste Policy Act" (1980)
- PL 99-240 "Low-Level Radioactive Waste Policy Amendments Act of 1985"
- United States Code (Federal laws codified by subject matter)
- Title 42 - Chapter 23 - Development and Control of Atomic Energy (§§ 2011 – 2297h–13)
- Specifically: 42 U.S.C.. 2021
- Code of Federal Regulations (Executive department and agency rules)
- Title 10 Energy – Chapter 1 Nuclear Regulatory Commission 10 CFR (§§ 1–199)
- Specifically: 10 CFR 61

Q&A: NRC determined the regulation can be relinquished to Agreement States, but the state must have a facility and the state must agree.

Comment: NRC is considering the different issues. Need to think about differently and carefully consider characteristics of each radioisotope and evaluate each waste to analyze its effects on the performance assessment. Those effects may be acceptable, but politically, they may not.

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Petersen, Inc. - Supporting the Nuclear Industry through Skilled Manufacturing

Nick Despain

Precision machining and fabrication

Makes containers for WIPP site

Production from raw materials to final product; sending to national labs for disposing of their materials

Manufactures glovebox systems and racks, etc., in their turn-key facility

Built hot cells used in Idaho National Lab

Can manufacture Type A and B transport casks

Helps with D&D equipment and spent fuel containers

Built melters at Hanford plant

Manufactures cannisters for vitrified waste

Builds nuclear submarine components for DOD

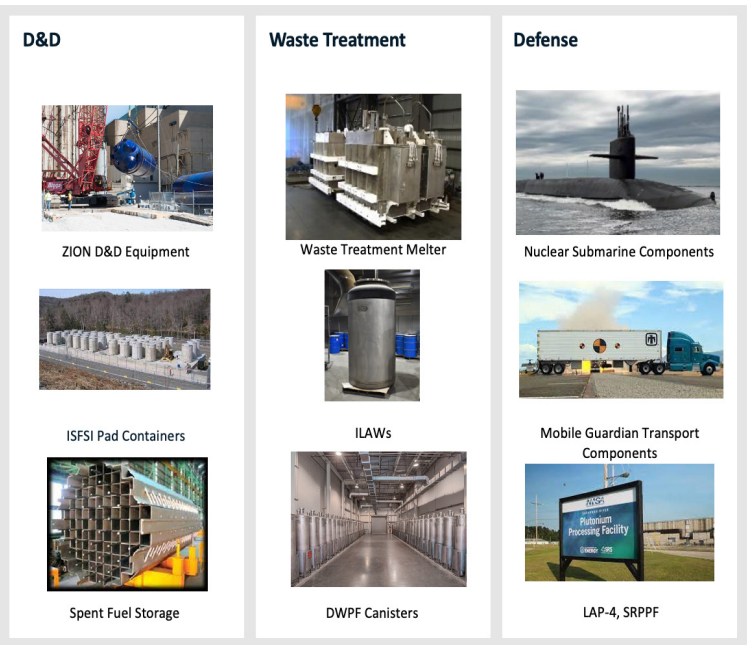
Produces large components for nuclear facilities

Workforce issues

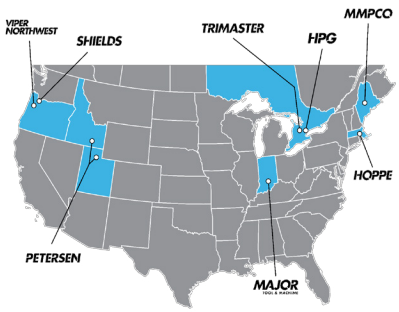
Retirements of folks with craft; training and developing workforce

About SMR

Does not have a facility ready today to build them, but is acquainted with companies and will work with whichever gets ready and funded first



Facilities



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NEI Update on New Reactors Technology

Katie Austgen

Current State of Advanced Nuclear

- Over 60 new technologies being actively developed by private sector
- DOE funding 12 different designs, >$5B over 7 years
  - 3 Demonstration Plants
  - 9 Technology Development
- U.S. utilities evaluating nuclear in integrated resource plans (IRPs)
- Growing interest in conversion of coal power sites to nuclear
- Continued strong support in Congress

- Advanced reactor technologies
  - Light-water SMRs
  - Non-water cooled
  - Micro-reactors
- Key enabling technologies
  - Advanced manufacturing
  - Coolant
  - Fuel
- New uses and applications
  - Remote locations
  - Mobile uses
  - Heat, Hydrogen, Desalination
- Non-power technologies
  - Space
  - Medical
- Fusion

Radioisotope powered systems—
Used in space applications; seeking commercial applications now –arctic, under sea vehicles, etc.

Micro reactors developed to replace diesel dependence - A dozen reactors in design now.

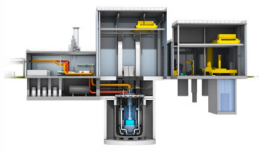
Nuclear Medicine --Some of the reactor companies have medical involvement making U.S. more self-sufficient.

Technology – TerraPower/GEH

Liquid Sodium Fast Reactor (SFR)

- 345 MWe
  - Molten salt thermal storage for peaking to 500 MWe
- Early in NRC interactions
- Requires HALEU – metallic fuel
- Possible higher temperature, non-electricity applications
- Innovative construction methods
- DOE: operational 2027 – 2030
- Location: Kemmerer, Wyoming – retiring coal facility

TerraPower/GEH's Natrium™



A technology developed to retire coal facilities and replace jobs and energy for local economy.

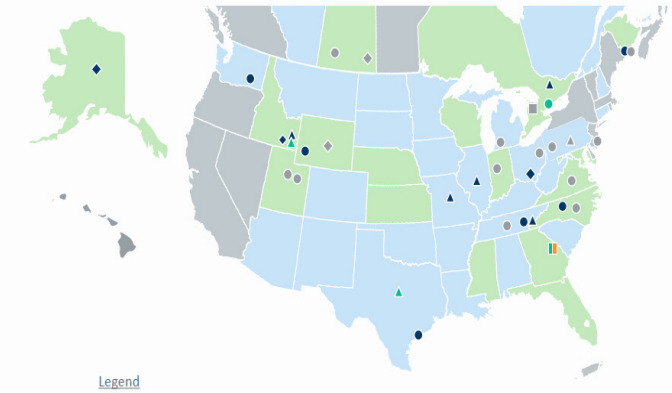
New Market Opportunities

Micro reactors unlock possibilities –

- Remote locations, micro grid development, use in defense installation like Alaska Air Force Base
- Mobile: can fit on truck or on container ship
- After a disaster, ability to stand up grid
- May use recycled fuel

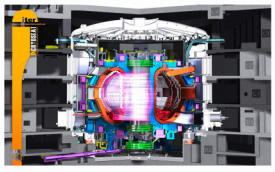
Advanced Nuclear Deployment Plans

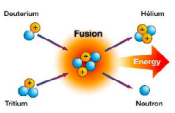
State support and projects that may be in operation by early 2030s



Updated 12/19/2023

Technology – Fusion





Private Development

- >15 Companies
- $2+ Billion invested
- Mostly from wealthy individuals

National Programs

- International Thermonuclear Experimental Reactor (ITER)
- Joint European Torus (JET)

TAE

 24

Considerable private development interest

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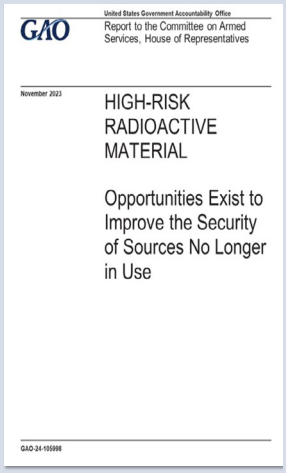
Sealed Source Activities
Ned Woodward, Government Accountability Office Assistant Director

Some GAO Findings

- Socioeconomic effects of a dirty bomb could be many billions of dollars (2019)
- Potential for greater use of alternatives (2021)
- Vulnerabilities persist in licensing radioactive materials (2022)


United States Government Accountability Office
GAO
Report to the Committee on Armed Services, House of Representatives
November 2023
HIGH-RISK RADIOACTIVE MATERIAL
Opportunities Exist to Improve the Security of Sources No Longer in Use
GAO-24-105998

Ongoing Work Expect to Issue before End of 2024

Whole of government look at preventing dirty bombs. Includes DHS, NRC, NNSA by looking at the role of each, their agreements, disagreements.

Radioactive Sources GAO Studied

Americium-241: Well logging sources. Since 2000, this has been supplied by foreign sources. DOE is addressing U.S. production now. The number of them is unknown as they are not tracked, but NSSA estimated 60 to 80 thousand came in to the U.S. since 2003.

Cesium-137: Blood irradiators for blood purification and medical research.

Cobalt-60: Used in the industrial sterilization industry.

Iridium-192: Used in the industrial sector for detecting cracks in welds.

Complications: disposal of foreign source materials and orphan sources created in oil boom/bust cycle.

Considerations:

- Suggest consider alternatives to replace radioactive materials
- Align agencies strategically who are at cross purposes.

ARDT Update: Lone Star State Happenings--A Legislative and Regulatory Update
Brian Christian

88th Texas Legislative Session January 2023

- The Sunset bill passed and increases transparency of permitting process, requiring that license information will be posted on the TCEQ website.
- TCEQ operation was renewed until 2035.
- Texas Nuclear Caucus formed with the Republican House members to address nuclear issues such as SMRs and what regulatory barriers there may be and increased interest in uranium mining in Texas.
- TCEQ and TX A&M Kingsville will have to do a uranium deposit study.
- No LLRW bills were filed or considered.
- Other environmental issues of environmental justice and climate change were raised but no legislation was enacted.

Future Activities

- ARDT preparing for LLRW issues to appear during the 2025 Legislative Session
- Andrews County Resolution on GTCC in opposition
- Budget requests from both TCEQ and TLLRWDCC
- Governor Abbott's initiative on nuclear technology, particularly for dispatchable power generation
- Coal-to-Nuclear electric generating facility conversion
- Streamlining uranium mining regulation
- Texas Nuclear Caucus

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Updates from U.S. Commercial Disposal Facilities

WCS, David Carlson, President

WCS is the largest private employer in Andrews County, TX, with over 120 site employees, $15 million payroll. Special Surcharges (5% of LLRW disposal revenue) equals $17.8 million to Andrews so far. WCS teaches radiation safety course in high schools, offers summer internships, and offers jobs to those who do well.

Direct distance to communities:

• Eunice, NM	5 miles
• Hobbs, NM	15 miles
• Jal, NM	24 miles
• Andrews	30 miles
• Seminole	30 miles
• Odessa	50 miles
• Midland	60 miles

Nearest residence is:

- 3.5 miles east, in NM @ 176 & 18

Nearest businesses are:

- URENCO (uranium facility)
  - adjacent to site in NM
- Lea County Landfill (trash disposal)
  - across 176 in NM
- PB Materials (concrete plant)
  - NW site boundary in NM
- Sundance Disposal (O&G waste)
  - NW site boundary in NM

Performance Assessment
Evaluated to one million years
Current disposed inventory has a peak dose of 0.5 millirem per year at 170,000 years from closure.

Disposal rates (prices) for the Compact Waste Disposal Facility (CWF) are in 30 Texas Administrative Code §336.1310 and Fees (surcharges) on disposal are established in Texas Health and Safety Code, Section 401.

WCS routinely disposes of irradiated hardware with dose rates >20,000 R/hr on contact
Collective team dose is typically less than 0.02 person-rem.

CWF Capacity – 9,000,000 ft^3
- Currently used = 325,000 ft^3 (3.6% of capacity)
- Phase 1 - 450,000 ft^3
- Phase 2 – 425,000 ft^3
  - Started Feb 2023
  - Completed Nov 2023
  - State authorization Feb 2024

FWF Capacity – 26,000,000 ft^3
- Currently used = 520,362 ft^3 (2% of capacity)

RCRA (LAW) Capacity – 62,000,000 ft^3
- Currently used = 29,300,000 ft^3 (48% of capacity)

Site is 14,000 acres with space for additional future expansion

EnergySolutions - Barnwell
Jason Jones, Director of Operations

- 235 acres licensed for disposal
- 123 acres in closed condition
- 16 acres available for future disposal (900,000 cu ft)
- 96 acres for other uses
- 28.4 million cubic feet buried since 1971
- 14.4 million curies buried
- ~3.1 million curies remaining (decay correction)
- 183 groundwater monitoring wells

Updates from U.S. Commercial Disposal Facilities - continued

Richland LLRW, NW Compact Facility, Hans Honerlah, Manager Strategic Services, Republic Services

Radiological Disposal Sites:
Richland Facility - Washington (NWIC Facility)
Grand View Facility – Idaho
Beatty Facility - Nevada
Belleville Facility – Michigan
Robstown Facility – Texas

Republic Services Richland

- Part 61 LLRW Facility – 1 of 4 in United States
- Located on 100 acres within the DOE Hanford Reservation in Richland, WA
- Originally Licensed in 1965
- Designated NWIC Facility (Accessible to 11 states in NW & RM Compacts - January 1, 1993)
- Operates through sublease agreement with State of WA
- Rate-regulated by WA Utility & Transportation Commission

Historical Volumes

Washington Facility has received an annual average volume of ~19,000 ft^3 (2013-2023).

Approximately 50% of volume is generated at Energy Northwest Columbia Generating Station.

Prior to LLRWPA of 1985, annual average volumes were much larger: ex. 1982-1985 ~ 1,400,000 ft^3.

Ample capacity remains to support generator needs through 2056.

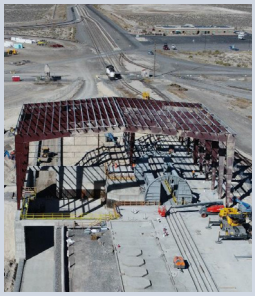
Richland Revenue Requirement

Year	Base RR Adjusted by Inflation	Total Prior Year Carryover	Final RR
2018	$5,976,482	$1,895,058	$7,871,540
2019	$6,151,681	$1,727,783	$7,879,464
2020	$6,255,450	$166,477	$6,421,927
2021	$6,329,230	$182,964	$6,512,194
2022	$6,584,107	$92,239	$6,676,346
2023	$7,031,600	$110,404	$7,142,004
2024	$7,280,743	$336,326	$7,617,069

EnergySolutions - Clive UT
Vern Rogers, Director, Regulatory Affairs

Capital improvements

- East Side Rotary Facility
- Evaporative storage
- LLRW Cover Construction
- Mobile equipment fleet upgrades
- Long-term Crane Lease



Licensing update

- Capacity Limitation
- Sealed Source disposal
- New Low Activity Waste Cell (amendment under review)
- Federal Cell Facility for DU and federally-generated LLRW (license application under review)
- License and Permit Renewals

Class A Low-Level Radioactive Waste

- Containerized Waste
- Large Components
- Bulk Waste

Class A Mixed Waste

- Stabilization
- Amalgamation
- Macroencapsulation
- Thermal Desorption (VTD)

EnergySolutions - Barnwell
Jason Jones, Director of Operations

Atlantic Compact only operations started July 1, 2008

Membership: South Carolina, New Jersey and Connecticut

- Receives about 9,000 cubic feet average yearly volume (excluding large component and IH volume)
- Average 60-70 containerized (only) shipments per year

- >90% of facility in closed condition and under institutional monitoring and maintenance
- Extended Care Fund Balance as of December 31, 2023 $155,997,895
- Projected Cost of Phase II Decommissioning $8,130,165

License: under timely renewal for over 20 years! Due to appeals external entities--

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Appalachian Compact
Delaware • Maryland • Pennsylvania • West Virginia

Contributed by Rich Janati, Administrator

Publication of Annual Report

The Appalachian States Low-Level Radioactive Waste Compact's annual report for calendar year 2022 was published earlier this year. In 2022, the Appalachian Compact disposed of about 67,000 ft^3 or 850 Ci of low-level radioactive waste (LLRW). In the Appalachian Compact, TENORM is not classified as LLRW and therefore, the report does not account for the quantity of TENORM disposed of within or outside the compact. The Appalachian Compact LLRW generators maintain access to both the Clive and the WCS facilities for disposal of their Class A, B and C wastes.

Decommissioning of Three Mile Island Unit 2 (TMI-2)

TMI-2 Solutions continues with the decommissioning activities at TMI Unit-2, leading to additional shipments of Class A LLRW to the Clive Facility in Utah. TMI-2 Solutions completed 15 shipments of Class A waste in 2023. It is expected that there will be 40 shipments of Class A waste to Clive in 2024.

Atlantic Compact
Connecticut • New Jersey • South Carolina

Meeting

The next Atlantic Compact Commission meeting has been scheduled on September 18, 2024 in Columbia. More details will be available in July. Contact M.K. Batavia, P.E. max@atlanticcompact.org

Southeast Compact
Alabama • Florida • Georgia • Mississippi • Tennessee • Virginia

Southeast Compact Commission Pilot Incentivization Program for Unwanted Source Disposal

No sources have been disposed of as yet due to complexities (finding sources, putting together a load, contracting). For details see https://secompact.org/

Hodes Award

The Southeast Compact Hodes Award provides cash award and expenses and the application is simple. Inquiries about the Richard S. Hodes, M.D. Honor Lecture Award should be directed to Tom Hansen, tom@secompact.org or visit the Commission web site at www.secompact.org.

Texas Compact
Texas • Vermont

Meeting
Thursday, May 23, 2024

via Zoom Meeting webinar and in person in Bay City, Texas at 9 am.

Thursday, August 22, 2024

via Zoom Meeting webinar and in person in Vermont at 9 am EST.

For agendas, check http://www.tllrwdcc.org/about-the-commission/public-meetings/

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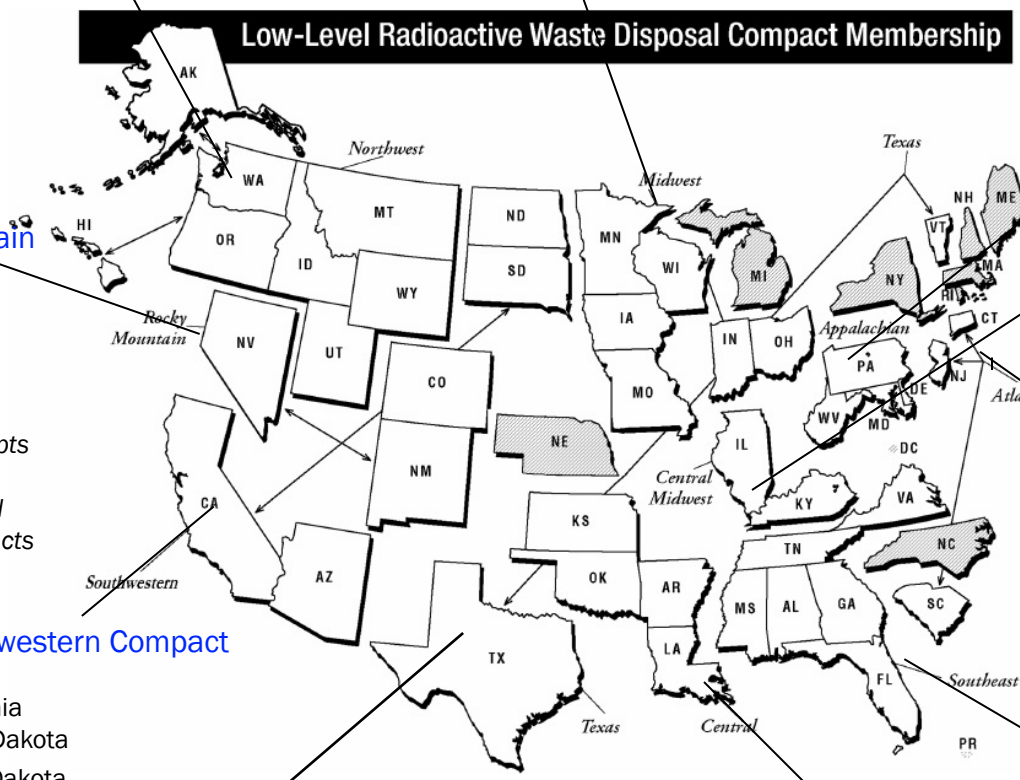
Low-Level Radioactive Waste Compact Membership



Northwest Compact
Alaska
Hawaii
Idaho
Montana
Oregon
Utah
Washington
Wyoming

Midwest Compact
Indiana
Iowa
Minnesota
Missouri
Ohio
Wisconsin

Appalachian Compact
Delaware
Maryland
Pennsylvania
West Virginia

Rocky Mountain Compact
Colorado
Nevada
New Mexico

Northwest accepts Rocky Mountain waste as agreed between Compacts

Central Midwest Compact
Illinois
Kentucky

Atlantic
Connecticut
New Jersey
South Carolina

Southwestern Compact
Arizona
California
South Dakota
North Dakota

Texas Compact
Texas
Vermont

Central Compact
Arkansas
Kansas
Louisiana
Oklahoma

Southeast Compact
Alabama
Florida
Georgia
Mississippi
Tennessee
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- DOE Public Affairs/Press Office - 202/586-5806
- DOE Distribution Center - 202/586-9642
- EPA (for program information, publications, laws and regulations) www.epa.gov
- EPA Information Resources Center - 202/260-5922
- EPA Listserve Network Contact Lockheed Martin EPA Technical Support at (800) 334-2405 or email (leave subject blank and type help in body of message) listserver@unixmail.rtpnc.epa.gov
- Government Accounting Office (GAO) Document Room - 202/512-6000
- Government Printing Office (to order entire *Federal Register* notices) - 202/ 512-1800
- Legislative Resource Center (to order U.S. House of Representatives documents)- 202/226-5200
- NRC Public Document Room - 202/ 634-3273
- NRC Reference Library (NRC regulations, technical reports, information digests, and regulatory guides) www.nrc.gov
- U.S. Government Printing Office (GPO) (for the Congressional Record, Federal Register,congressional bills and other documents, and access to more than 70 government databases) http://www.access.gpo.gov
- U.S. Senate Document Room - 202/224-7860
- Variety of documents through numerous links at LLW Forum, Inc. at https://llwforum.org/

Acknowledgment & Disclaimer

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