

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	US Department of Energy
DOT	US Department of Transportation
EPA	US 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	US Nuclear Regulatory Commission
OAS	Organization of Agreement States
TENORM	Technologically enhanced naturally occurring radioactive material

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Officers

Joe Klinger, Chair
Tom Hansen, Chair-Elect
Earl Fordham, Past-Chair
Alyse Peterson, Treasurer

Forum Corner


 LLW
FORUM

Board Meeting Focus

The Board's focus at the November and December Board meetings included:

- Planning the Spring Meeting
- Selection of new Chair-Elect, Tom Hansen. Joe will continue to assist as Chair as Tom becomes oriented.
- Personnel issues - Executive Director evaluation has been completed, and a new one-year contract has been approved.
- Selecting Orlando, FL as the site of the Spring 2024 meeting.
- Working group on issues related to import/export between compacts: Stephen is still working on revising management rule. The LLW Management Rule is out for comment on TX/VT Compact Website. He is working on the latest information regarding out of compact LLW limit for acceptance at WCS.

Focus on Financials

- Alyse is working on the annual review with the accountant who performed an initial review and requested documents. Agreed upon procedures engagement will be completed by the end of the year.
- Alyse got randomly selected at airport and got questions for the amount of cash from the LLW Forum meeting in her possession.

Safety Moment

Safety Moment: Be careful pulling over to the side of the road--lots of accidents occurring.

LLW Forum Meeting Dates

LLW Forum Board of Directors
November 9 and December 14, 2022

LLW Forum Spring Meeting
March 22-23, 2023 – Charleston, SC

- March 21, 2023 - Tour of Barnwell Disposal Facility
- March 24, 2023 -DSWG Meeting

LLW Forum Fall Meeting
October 4-5, 2023 - Salt Lake City, UT

Mission & Operations Committee - Strategic Plan Update

The Committee's main focus is on a more substantive survey, based on the survey from a few years back.

M&O expressed thanks to Tom Hansen for being involved in Missions and Operations work.

Executive Director News

Dan attended the NORM/TENORM meeting where he talked about the Compacts' involvement, especially that of the Rocky Mountain Compact. He visited Charleston and Orlando working on meeting arrangements. Dan also attended the SW Compact meeting where the Forum presented Kathy Davis with a Resolution. See page 12 for more information.

Save the Date!



LLW FORUM SPRING MEETING

The Low-Level Radioactive Waste Forum will be holding its Spring Meeting March 22-23, 2023 at the Francis Marion Hotel in Charleston, SC.

Due to high demand, we recommend that you book your room **AS SOON AS POSSIBLE**. The cut-off date to receive the LLW Forum rate is February 20.

[Click here to book now!](#)

[Click here to register online.](#)

Tour of Barnwell Site: March 21

LLW Forum Meeting: March 22-23

Atlantic Compact Meeting: March 22

Southwestern Compact Meeting: March 23

DSWG Meeting: March 24

Reminder: Forum Participation

Waste Management Conference

Reminder-- LLW Forum has two sessions – Hodes Awards and panel discussion.

Monday, February 27, 2023

Track 3 - Low-Level Waste (LLW), Intermediate Level Waste (ILW), Very Low-Level Waste (VLLW), Mixed Waste (MW), By Product Material, TENORM, NORM Residues, Enriched and Depleted Uranium (DU)

019 Roundtable: Hot Topics in US Commercial LLW Management (R3.1)

031 - LLW Forum's Hodes Award Presentation and Selected Key Topics in US Commercial LLW Management (3.2)

Registration at <https://www.wmsym.org/register/rates-information/>

**WM2023 | FEBRUARY 26 –
MARCH 2, 2023
PHOENIX, ARIZONA, USA**

DSWG

DSWG Meeting October 14, 2022

In person and via Webex, this meeting was by far the best attended meeting. Five DSWG members; seven GAO members; NRC attendance; NNSA's Shea Cotton and assistant.

Thanks to everyone who participated.

Source Collection and Threat Reduction

SCATR

Current Status of the Collection and Disposal of High Activity, Sealed Sources

by Charles R. "Russ" Meyer
Technical Assistant to the
Executive Director
Conference of Radiation Control Program Directors

The Source Collection and Threat Reduction (SCATR) program conducted its pilot disposal of a Cs-137 source with an activity greater than the newly designated generic maximum activity (130 Ci) in 2017 at the Northwest Compact, commercial disposal site for low-level radioactive waste, with the use of the U.S. Nuclear Regulatory Commission's Branch Technical Position on Concentration Averaging. Another similar disposal was made at the Texas/Vermont Compact commercial disposal site in 2019. The two disposals demonstrated the ability to dispose of quantities greater than the generic level, but less than the Class C limit.

The manufacturer of the first device removed and transported it to Northwest Compact. They used their own Type B cask to accomplish the removal. This approach reduced the total cost for the project. The second device was removed and disposed by a company using a Type B cask that was authorized to transport a wider variety of radionuclides and quantities of radionuclides than the first cask. Two factors lead to a much higher cost of using this cask - there are very few of these casks, and there is a very high demand for them.

High rental costs dampen the interest of participants who possess source(s) that require a Type B package for transportation. The SCATR broker searched for and found a vendor of a Type B package that would be less costly to rent and readily available. He was able to contract with the manufacturer for a rental charge that reduced the cost of transportation almost to half. CRCPD has recently learned that these costs may soon decrease some more.

The table at the conclusion of this article presents the total cost of disposal for the higher activity sources that have been disposed since the program started and additional information relating to cost. The totals represented are the total cost. The cost share is the percent of that total that is paid by the SCATR program.

The types of devices are predominantly CDV-794s, one or two CDV-793s and the remainder mostly higher activity sources are from self-shielded irradiators. The eight Sr-90 sources totaling 12 Ci were in a single device and could only be transported in one package. They, therefore, had to be transported in a Type B package. Five of the shipments had to be made in Type B packages. One of the Cs-137 sources that was 28 Ci when shipped had to be shipped in a Type B package, because its Special Form certificate had expired and was not renewed. Circumstances like this are occasionally found. Licensees may delay making an expensive disposal for a source, which has a long half-life. If the source is still above its A_2 limit and its special form certification expires when the licensee decides to dispose of it, they may be obliged to dispose of it in a Type B package.

As can be seen from the above discussion, Cs-137 is the main isotope that can provide the flexibility to use its A_1 value to avoid using a Type B package if it is special form. Co-60 is limited because its A_1 value is the same as its A_2 value (11 Ci), i.e., any package containing more than the A_2 value, by definition, exceeds the A_1 and requires a Type B package. High activity Co-60 sources may be manufactured to meet special form criteria because they are tested to more stringent standards, but they are not provided any relief from Type B packaging requirements.

Sr-90 is like Co-60 in that its A_1 is equal to its A_2 value. Most short-lived radioisotopes have very high A_1 values and are, therefore, rarely transported at activity levels that that would require them to be transported in a Type B package.

Source Collection and Threat Reduction

SCATR

Current Status of the Collection and Disposal of High Activity, Sealed Sources

- continued

The primary obstacle to disposal of the high activity, sealed sources is its cost. CRCPD and its broker will continue to work towards reducing the cost. Realistically, the cost will only decrease so much and will still be very high. CRCPD and its

broker also are working with the NRC to establish a realistic cost basis to develop a financial security rule for category 3 and higher activity, sealed sources. CRCPD has supplied NRC with current lists of the total disposal cost for both “regular” waste and high activity, sealed sources. Hopefully, these efforts will ameliorate if not abrogate the financial burdens encountered when end of life expenses for disposal of “regular” and high activity, radioactive waste occur.

TABLE OF HIGH ACTIVITY SEALED SOURCES COLLECTED AND DISPOSED TO DATE

Date of Disposal	State of Origin	No. Sources/ Radioisotope	Disposed Activity (Ci)	Disposal Site	Package Type (A or B)	Total Cost/Cost Share	Transporter
9/27/2017	NM	1/Cs-137	550	US Ecology	B	\$109,048/100%	Device Manufacturer
12/11/2019	VA & FL	2/Cs-137	379.5	WCS	B	\$524,960/100%	Former Vendor
11/23/2020	TN & MA	2/Cs-137, 8/Sr-90	54.1/ 12	WCS	B	\$306,000/30%	Former Vendor
12/15/2021	TX	1/Cs-137	52.84	WCS	A	\$41,000.00/30%	Broker
9/21/2022	MA	1/Cs-137	115.00	WCS	B	\$172,000.00/50%	Broker
8/24/2021	SC	1/Cs-137	52.94	WCS	A	\$76,416.00/30%	Broker
12/12/2021	MS	1/Cs-137	52.94	WCS	A	\$80,700.00/30%	Broker
11/11/2022	PA	1/Cs-137	28.00	WCS	B	\$112,000.00/50%	Broker Using New Cask
Scheduled for 12/22	MA	2/Cs-137	105.32	WCS	A (in 2 pkgs)	\$164,283.00/30%	Broker

Appalachian States Low-level Radioactive Waste Compact Commission (ACC) Update

By David J. Allard, CHP



History and Operations

As most LLW Forum *Notes* readers know, with a federal LLRW law as motivation, the Commonwealth of Pennsylvania and states of DE, MD and WV passed enabling legislation to form the Appalachian States Low-level Radioactive Waste Compact (ACC) back in the mid- to late-1980s. At that time, several statutes with powers and duties to collect fees and construct a LLRW disposal site in the host state of PA were established. These laws allowed preemption of interstate commerce with respect to LLRW, and were sanctioned by an Act of the U.S. Congress. Despite the great effort in the 1990s by (then) PA Department of Environmental Protection (DEP) Bureau of Radiation Protection (BRP) Director Bill Dornsife, Nuclear Safety (NS) Division Chief Rich Janati, BRP and ACC attorneys, staff and contractors, as well as the expenditure of tens of millions of dollars – the DEP was unable to construct a LLRW disposal facility through a voluntary siting process. In late 1998, the DEP with support of the ACC suspended the siting effort, terminated site development contracts, and closed the ACC's office in Harrisburg.

Since 1999, when (coincidentally) the writer became BRP's

Director, Rich Janati and his NS staff have done an outstanding job in managing the DEP and ACC LLRW programs. All required LLRW disposal volume and curie tracking, fiscal management and budgeting has been performed by DEP staff. More than two decades of ACC LLRW annual reports can be found on the DEP website and eLibrary. See [Reports 1999 - 2008](#) and [Reports 2009 - 2020](#).

Again, as many know, both Rich and I have both recently retired from DEP. However, Rich has continued as an annuitant, and I maintain my [*pro bono*] position as Chairman of the ACC. Nonetheless, it is hoped the newly elected PA governor will correct the eight years of failings of the outgoing administration, appoint the required four PA agency heads and four alternates to the ACC, and request PA Senate approval of those individuals. Regardless, business of the ACC must and will continue.

Annual Meeting

That business of the ACC includes a required annual meeting. On October 28, 2022 the ACC held its annual meeting at the Harrisburg Hilton. At that time the past fiscal year's (FY) data, recent audit report, and coming FY budget were

presented and approved. The ACC Bylaws were amended to allow meetings at locations other than in the host state, and provisions were established for the functions of the Executive Director to be delegated to an Administrator. Also, contracting language was drafted, and funds allocated in the new budget to hire an independent contractor as the Administrator if needed at any point in the future. Additionally, the writer [from PA] and Kaley Laleker [from MD] were re-elected Chairman and Vice-chair of the ACC respectively. The status of various LLRW disposal sites and compact commissions were reviewed, in particular, relating to access of ACC generators for disposal of Class A, B and C waste. As has been the case for more than twenty years, ACC compiles LLRW volume and curie data from the [U.S. DOE's MIMS database](#).

Disposal Trends

It has been very interesting over the years to review and discuss the ACC's LLRW disposal trends. Given the number of operating nuclear power plants (NPP) and major radiological clean-up sites, typically PA has the highest volume and activity. Historically the high concentration Class C LLRW went to the Barnwell

Appalachian States Low-level Radioactive Waste Compact Commission (ACC) Update - continued

site in SC, but since access was cut-off in 2008, the ACC's NPPs had to store waste. But now with access to the WCS site, that Class C waste disposal has recently shifted to TX. Similarly, the non-compact EnergySolutions LLRW site in UT has gotten the bulk of the low-activity Class A waste. However, if one examines the Tables and Figures in the linked LLRW Annual Reports, those trends are shifting, with higher volumes of Class A waste now going to TX. Further, when compiling the CY20 LLRW data for last year's report, it was discovered that TENORM waste disposal in UT and TX had been tallied as LLRW for several years. This was significant in that the ACC does not consider TENORM waste to be LLRW. That data was corrected and presented in the CY20 annual LLRW report. The soon to be published CY21 annual report will continue to provide a break-out of LLRW and TENORM data. It is fascinating that the volumes of TENORM waste currently exceed the LLRW. Tables 1, 2 and 3 provide the activity and volume of LLRW and TENORM disposed of in UT, SC and TX over the past two decades. This information was compiled by DEP NS staff, and presented to the ACC members by Rich Janati in October.

Table 1. Appalachian Compact Disposed LLRW Volume in Cubic Feet 2001 to 2021

Year	WV	DE	MD	PA	Total
2001	44	76	10,760	534,429	545,310
2002	183	366	6,753	55,371	62,674
2003	152	74	3,703	74,901	78,829
2004	35	49	13,178	55,136	68,397
2005	2	74	107,956	91,293	199,326
2006	38	59	48,132	57,628	105,857
2007	49	43	21,016	78,455	99,562
2008	132	415	6,703	113,483	120,733
2009*	134	431	21,451	103,667	125,684
2010*	11	29	22,958	76,519	99,518
2011*	19	1,061	10,569	155,509	167,157
2012*	21	75	12,364	122,380	134,841
2013*	45	340	23,597	72,067	96,048
2014**	25	43	72,334	56,040	128,442
2015**	19	45	18,203	91,223	109,490
2016**	2	5	7,351	199,292	206,649
2017**	1	34	6,588	377,234	383,857
2018**	17	0	5,498	272,620	278,135
2019**	0	26	17,193	194,052	211,271
2020**	22	3	15,709	129,811	145,545
2021**	36	8	11,824	58,078	69,946
Total	987	3,255	463,839	2,969,188	Grand Total 3,437,270

Note: years 2001 to 2008 includes LLRW disposal at Barnwell, South Carolina, and Energy Solutions, Clive, Utah.

* 2009 to 2013 LLRW volume only includes disposal at EnergySolutions in Clive, Utah.

** 2014 to 2021 includes LLRW disposal at EnergySolutions in Clive, Utah, and Waste Control Specialists in Andrews, Texas.

Table 2. Appalachian Compact Disposed LLRW Activity in Curies 2001 to 2021

Year	WV	DE	MD	PA	Total
2001	0.0	0.0	903.3	168,919.6	169,822.9
2002	0.1	0.5	244.5	6,777.4	7,022.5
2003	0.2	24.7	166.3	241,649.8	241,841.0
2004	0.8	0.2	11,830.7	18,890.3	30,722.0
2005	0.7	31.3	156.8	58,786.2	58,975.0
2006	0.0	11.9	60.1	91,719.1	91,791.1
2007	0.2	12.9	25,304.7	492,579.3	517,897.1
2008	0.1	12.2	2,181.5	283,328.8	285,522.6
2009*	0.0	0.5	4.7	1,001.4	1,006.6
2010*	0.0	0.0	1.4	656.8	658.2
2011*	0.0	1.0	1.8	492.6	495.4
2012*	0.0	0.0	2.1	449.3	451.4
2013**	0.0	45.3	15.7	458.5	519.5
2014**	0.0	0.0	260.7	1,212.8	1,473.5
2015**	0.0	0.0	27.8	4,147.3	4,175.1
2016**	0.4	0.0	209.0	2,020.1	2,229.5
2017**	0.0	0.0	178.5	1,711.3	1,889.8
2018**	0.0	0.0	125.3	42,027.5	42,152.8
2019**	0.0	0.0	72.6	834.1	906.7
2020**	0.0	0.0	1.52	1,212.0	1,213.5
2021**	0.0	0.0	68.0	1,615.0	1,683.0
Total	2.6	140.6	41817.1	1,420,489.2	Grand Total 1,462,449.4

Note: years 2001 to 2008 includes LLRW disposal at Barnwell, South Carolina, and EnergySolutions, Clive, Utah.

* 2009 to 2013 LLRW activity only includes disposal at EnergySolutions in Clive, Utah.

** 2014 to 2021 includes LLRW disposal at EnergySolutions in Clive, Utah, and Waste Control Specialists in Andrews, Texas.

Appalachian States Low-level Radioactive Waste Compact Commission (ACC) Update - continued

During the 2022 ACC annual meeting the writer also discussed the aspect of data in these Tables only represents LLRW and TENORM waste disposed of at licensed sites. It is known that several RCRA Subtitle C sites in ID, MI and TX have permits that allow disposal of very low activity licensed LLRW and unlicensed TENORM. And in fact, from BRP's clean-up oversight experience, it is known that significant licensed LLRW volumes from PA clean-ups have been disposed of at RCRA C sites under the U.S. NRC's alternate disposal regulatory construct in 10 CFR 20.2002. Further, all RCRA Subtitle D landfills in PA are allowed to dispose of solid TENORM waste. Additionally, it appears that since 2016, solids from the treatment of oil and gas well hydraulic fracturing and produced water in PA often exceed the U.S. DOT hazmat Class 7 shipping concentration of 270 picocuries per gram – and are now being shipped to license LLRW sites in TX and UT. As communicated to the Oil & Gas (O&G) industry after the publication of the DEP TENORM Study in 2016, it would be unacceptable to ship loads of TENORM waste to a RCRA D landfill with DOT radioactive placards. Also not accounted for, are the liquid O&G TENORM waste volumes that may be

Table 3. Disposed Compact LLRW and TENORM 2016 to 2021

Years	TENORM		LLRW	
	Volume (ft ³)	Activity (Ci)	Volume (ft ³)	Activity (Ci)
2016	38,400	0.9	206,649	2229.5
2017	112,032	2.7	383,856	1889.8
2018	66,048	1.9	278,136	42152.8
2019	108,096	2.9	211,271	906.7
2020	250,344	3.5	145,545	1213.5
2021	212,750	2.6	69946	1683.0
Total	787,670	14.5	1,295,403	50,075.3

Note: This table separates waste that is considered Technically Enhanced Naturally Occurring Radioactive Material (TENORM) and compares the values to the LLRW generated within the Compact for both volume and activity in the given calendar year (CY).

disposed of via permitted in-state or out-of-state injection wells. Thus, the complete picture for LLRW and TENORM disposal from PA and the ACC is not always crystal clear, complete, and is a bit complicated. Nonetheless, the ACC will continue to strive for transparency with the public and other stakeholders, and track and report the disposal of PA, DE, MD and WV LLRW and TENORM at licensed disposal facilities in UT and TX.



Appalachian Compact

Delaware • Maryland •
Pennsylvania • West Virginia

Meeting
October 28, 2022

- Election of Officers - Chairperson
- Hiring an Administrator for the Commission
- Adoption of Revised Approved Budget for FY 2022-23 and Proposed Budget for FY 2023-24

<https://www.dep.pa.gov/Business/RadiationProtection/Appalachian/Pages/Meetings-and-Bylaws.aspx>

Also see the article about the compact in this edition.

Atlantic Compact

Connecticut • New Jersey • South Carolina

Meeting
March 23, 2023

The Atlantic Compact Commission will hold its spring meeting on March 22, 2023 at 1 pm in the Pinckney Room of the Francis Marion Hotel. The meeting is open to the public. The draft agenda is posted on the compact website at www.atlanticcompact.org and includes:

- Proposed Budget request for FY 2024 (July 1, 2023-June 30, 2024)
- Revenue/Expense Report for the period July 1, 2022 - Dec. 31, 2022
- Audit Report from Brittingham Group for FY22 (Year ended June 30, 2022)

Central Compact

Arkansas • Kansas • Louisiana • Oklahoma

Special Meeting
November 17, 2022

The meeting agenda included:

FY22 Draft Audit

- Discussion of Submittal of Annual Reports
- Report on Status of FY23 Initiatives
- Contract with 3rd party for Administrator Duties
- Review By-laws to propose modernization and other changes that may be needed
- Status of Commissioner Appointments

Northwest Compact

Alaska • Hawaii • Idaho •
Montana • Oregon • Utah • Washington • Wyoming

Meeting
December 5, 2022

The Committee of the Northwest Interstate Compact (NWIC) on Low-Level Radioactive Waste (LLRW) Management meet virtually with all Compact States attending. For more information, contact Earl Fordham, Washington State Department of Health, at (509) 628-7628.

**Utah Waste Management and Radiation
Control Board**
December 5, 2022

The Utah Waste Management and Radiation Control Board has approved the following rulemaking actions to be placed in the Utah State Bulletin:

- Proposed amendments to R315-15, R315-260, R315-261, R315-262, R315-263, R315-264, and R315-265 of the hazardous waste rules in response to comments from U.S. EPA Region 8.
- Proposed changes to R313-15-501, R313-34-3, R313-35-120, R313-36-3 and R313-38-3, to incorporate federal regulatory changes made by the NRC to the federal radioactive materials regulations in 2020.
- Proposed changes to R313-28-31 amend the requirement for gonadal shielding (GS) during abdominal and pelvic radiography.
- Final adoption of changes to R313-19-100, Transportation, to incorporate federal regulatory changes requested by the Nuclear Regulatory Commission (NRC).

Southwestern Compact

Arizona • California • South Dakota • North Dakota

Meeting

90th Southwest Compact Meeting November 15, 2022

Agenda included:

- Reports from the Chair, ED, party states and licensee designee
- Staff evaluations and ED and counsel contract review.
- Annual Governor's report
- FY budgets for FY 22-23 and 23-34
- Fee schedule.
- Election of officers

Contact: swllrwcc@swllrwcc.org

Website: www.swllrwcc.org

See the following page for the Forum's Resolution honoring Kathy Davis.

Texas Compact Texas • Vermont

Meetings November 17, 2022

January 26, 2023

via Zoom Meeting webinar and in person at the Texas State Capitol in Austin, Texas

Thursday, April 6, 2023

via Zoom Meeting webinar and in person at a location TBD

Check [link to agendas](#) when more information is available.

November 17 meeting included:

Rules Committee Report - Adoption of Changes to Rules 675.20 and 675.21 that were proposed October 14, 2022:

- 31 TAC §675.20 - Definitions
- 31 TAC §675.21 - Exportation of Waste to a Non-Party State for Disposal

Management Rule

The Management Rule is in the final process of preparing a draft for the Rules Committee and is in an informal comment period. An update will be given in January.

Sunset Rule for the State of Texas

No recommendations were made by the Sunset Commission to change TLLRWDCC other than to recommended extension for the maximum period of 12 years.

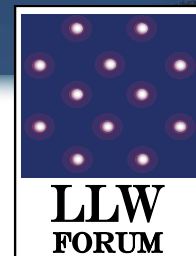


Dan Shrum
presenting the
Forum's Resolution
to Kathy Davis.

Forum's Resolution Honoring Kathy Davis

Honoring Her Retirement from the Southwestern Compact

Arizona • California • South Dakota • North Dakota



LOW-LEVEL RADIOACTIVE WASTE FORUM
RESOLUTION 2022-01

HONORING KATHY DAVIS
BOARD MEMBER
EXECUTIVE DIRECTOR OF THE SOUTHWESTERN COMPACT

November 15, 2022

WHEREAS, the Low-Level Radioactive Waste Forum (Forum) was organized to serve the interests of the Interstate Low-Level Radioactive Waste Compacts and the States in implementing the Federal Low-Level Radioactive Waste Policy Act (1980) and subsequent Amendments Act of 1985;

WHEREAS, Kathy Davis faithfully and diligently served the Southwestern Compact for over 23 years;

WHEREAS, as a board member, Kathy worked to advance the goals of the Interstate Low-Level Radioactive Waste Compacts and States through close interaction with federal and state government agencies, the nuclear power industry, other generators of low-level radioactive waste, commercial waste management businesses, low-level radioactive waste advocacy groups, and various professional organizations;

WHEREAS, effective November 15, 2022, Kathy retired, concluding her many years of service to the Southwestern Compact and the LLW Forum;

NOW, THEREFORE, BE IT RESOLVED that the Forum, on behalf of its members, recognizes Kathy Davis and hereby:

Expresses the Forum's deepest appreciation and gratitude for her extensive service, invaluable contributions, dedicated leadership, and unwavering commitment to the Forum as a Board Member and Treasurer; and

Wishes her well in her future professional and personal endeavors and interests.

BE IT FURTHER RESOLVED that this resolution be presented to Kathy Davis in recognition of her years of service and contributions to the Low-Level Radioactive Waste Forum.

PRESENTED this 15th day of November, 2022.

A handwritten signature in black ink, reading "Joseph C. Klingman".

Low-Level Radioactive Waste Forum

Advanced Reactors

DOE National Laboratory Makes History by Achieving Fusion Ignition

WASHINGTON, D.C. — The U.S. Department of Energy (DOE) and DOE's National Nuclear Security Administration (NNSA) today announced the achievement of fusion ignition at Lawrence Livermore National Laboratory (LLNL) — a major scientific breakthrough decades in the making that will pave the way for advancements in national defense and the future of clean power. On December 5, a team at LLNL's National Ignition Facility (NIF) conducted the first controlled fusion experiment in history to reach this milestone, also known as scientific energy breakeven, meaning it produced more energy from fusion than the laser energy used to drive it. This historic, first-of-its-kind achievement will provide unprecedented capability to support NNSA's Stockpile Stewardship Program and will provide invaluable insights into the prospects of clean fusion energy, which would be a game-changer for efforts to achieve President Biden's goal of a net-zero carbon economy.

"This is a landmark achievement for the researchers and staff at the National Ignition Facility who have dedicated their careers to seeing fusion ignition become a reality, and this milestone will undoubtedly spark even more discovery," said U.S. Secretary of Energy Jennifer M. Granholm. "The Biden-Harris Administration is committed to supporting our world-class scientists — like the team at NIF — whose work will help us solve

humanity's most complex and pressing problems, like providing clean power to combat climate change and maintaining a nuclear deterrent without nuclear testing."

"We have had a theoretical understanding of fusion for over a century, but the journey from knowing to doing can be long and arduous. Today's milestone shows what we can do with perseverance," said Dr. Arati Prabhakar, the President's Chief Advisor for Science and Technology and Director of the White House Office of Science and Technology Policy.

"Monday, December 5, 2022, was a historic day in science thanks to the incredible people at Livermore Lab and the National Ignition Facility. In making this breakthrough, they have opened a new chapter in NNSA's Stockpile Stewardship Program," said NNSA Administrator Jill Hruby. "I would like to thank the members of Congress who have supported the National Ignition Facility because their belief in the promise of visionary science has been critical for our mission. Our team from around the DOE national laboratories and our international partners have shown us the power of collaboration."

"The pursuit of fusion ignition in the laboratory is one of the most significant scientific challenges ever tackled by humanity, and achieving it is a triumph of science, engineering, and most of all, people," LLNL Director Dr. Kim Budil said. "Crossing this threshold

is the vision that has driven 60 years of dedicated pursuit — a continual process of learning, building, expanding knowledge and capability, and then finding ways to overcome the new challenges that emerged. These are the problems that the U.S. national laboratories were created to solve."

"This astonishing scientific advance puts us on the precipice of a future no longer reliant on fossil fuels but instead powered by new clean fusion energy," U.S. Senate Majority Leader Charles Schumer said. I commend Lawrence Livermore National Labs and its partners in our nation's Inertial Confinement Fusion (ICF) program, including the University of Rochester's Lab for Laser Energetics in New York, for achieving this breakthrough. Making this future clean energy world a reality will require our physicists, innovative workers, and brightest minds at our DOE-funded institutions, including the Rochester Laser Lab, to double down on their cutting-edge work. That's why I'm also proud to announce today that I've helped to secure the highest ever authorization of over \$624 million this year in the National Defense Authorization Act for the ICF program to build on this amazing breakthrough."

"After more than a decade of scientific and technical innovation, I congratulate the team at Lawrence Livermore National Laboratory and the National Ignition Facility for their historic

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accomplishment,” said U.S. Senator Dianne Feinstein (CA). “This is an exciting step in fusion and everyone at Lawrence Livermore and NIF should be proud of this milestone achievement.”

“This is an historic, innovative achievement that builds on the contributions of generations of Livermore scientists. Today, our nation stands on their collective shoulders. We still have a long way to go, but this is a critical step and I commend the U.S. Department of Energy and all who contributed toward this promising breakthrough, which could help fuel a brighter clean energy future for the United States and humanity,” said U.S. Senator Jack Reed (RI), the Chairman of the Senate Armed Services Committee.

“This monumental scientific breakthrough is a milestone for the future of clean energy,” said U.S. Senator Alex Padilla (CA). “While there is more work ahead to harness the potential of fusion energy, I am proud that California scientists continue to lead the way in developing clean energy technologies. I congratulate the scientists at Lawrence Livermore National Laboratory for their dedication to a clean energy future, and I am committed to ensuring they have all of the tools and funding they need to continue this important work.”

“This is a very big deal. We can celebrate another performance

record by the National Ignition Facility. This latest achievement is particularly remarkable because NIF used a less spherically symmetrical target than in the August 2021 experiment,” said U.S. Representative Zoe Lofgren (CA-19). “This significant advancement showcases the future possibilities for the commercialization of fusion energy. Congress and the Administration need to fully fund and properly implement the fusion research provisions in the recent CHIPS and Science Act and likely more. During World War II, we crafted the Manhattan Project for a timely result. The challenges facing the world today are even greater than at that time. We must double down and accelerate the research to explore new pathways for the clean, limitless energy that fusion promises.”

“I am thrilled that NIF—the United States’ most cutting-edge nuclear research facility—has achieved fusion ignition, potentially providing for a new clean and sustainable energy source in the future. This breakthrough will ensure the safety and reliability of our nuclear stockpile, open new frontiers in science, and enable progress toward new ways to power our homes and offices in future decades,” said U.S. Representative Eric Swalwell (CA-15). “I commend the scientists and researchers for their hard work and dedication that led to this monumental scientific achievement, and I will continue to push for robust funding for NIF to support advancements in fusion research.”

LLNL’s experiment surpassed the fusion threshold by delivering 2.05 megajoules (MJ) of energy

to the target, resulting in 3.15 MJ of fusion energy output, demonstrating for the first time a most fundamental science basis for inertial fusion energy (IFE). Many advanced science and technology developments are still needed to achieve simple, affordable IFE to power homes and businesses, and DOE is currently restarting a broad-based, coordinated IFE program in the United States. Combined with private-sector investment, there is a lot of momentum to drive rapid progress toward fusion commercialization.

Fusion is the process by which two light nuclei combine to form a single heavier nucleus, releasing a large amount of energy. In the 1960s, a group of pioneering scientists at LLNL hypothesized that lasers could be used to induce fusion in a laboratory setting. Led by physicist John Nuckolls, who later served as LLNL director from 1988 to 1994, this revolutionary idea became inertial confinement fusion, kicking off more than 60 years of research and development in lasers, optics, diagnostics, target fabrication, computer modeling and simulation, and experimental design.

To pursue this concept, LLNL built a series of increasingly powerful laser systems, leading to the creation of NIF, the world’s largest and most energetic laser system. NIF—located at LLNL in Livermore, Calif.—is the size of a sports stadium and uses powerful laser beams to create temperatures and pressures like those in the cores of stars and giant planets, and inside exploding nuclear weapons.

Achieving ignition was made possible by dedication from LLNL

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employees as well as countless collaborators at DOE's Los Alamos National Laboratory, Sandia National Laboratories, and Nevada National Security Site; General Atomics; academic institutions, including the University of Rochester's Laboratory for Laser Energetics, the Massachusetts Institute of Technology, the University of California, Berkeley, and Princeton University; international partners, including the United Kingdom's Atomic Weapons Establishment and the French Alternative Energies and Atomic Energy Commission; and stakeholders at DOE and NNSA and in Congress.

Sources: [Lawrence Livermore National Laboratory](#) and [DOE News Release](#)

NRC Research Prospectus FY 2022-2024

<https://www.nrc.gov/docs/ML2223/ML22235A651.pdf>
See sections on Advanced Reactors and Risk Analysis

NRC Briefing on Regulatory Approaches for Fusion Energy Devices (Public Meeting)

Tuesday, November 8, 2022

(Contact: Samantha Lav: 301-415-3487)

Additional Information: The meeting will be held in the Commissioners' Conference Room, 11555 Rockville Pike, Rockville, Maryland. The public is invited to attend the

Commission's meeting in person or watch live via webcast at the Web address – <https://video.nrc.gov/>.

NRC Overview of Advanced Reactor Fuel Activities (Public Meeting)

December 8, 2022

9:00 a.m. (Contact: Stephanie Devlin-Gill, 301-415-5301)

Additional Information: The meeting will be held in the Commissioners' Conference

Room, 11555 Rockville Pike, Rockville, Maryland. The public is invited to attend the

Commission meeting in person or watch live via webcast at the Web address – <https://video.nrc.gov/>.

Decommissioning & Low-Level Waste

Strategic Programmatic Overview of the Decommissioning and Low-Level Waste and Nuclear Materials Users Business Lines (Public Meeting)

(Contacts: Annie Ramirez: 301-415-6780; Candace Spore: 301-415-8537)

January 26, 2023

9:00 a.m.

Additional Information: The meeting will be held in the Commissioners' Conference Room, 11555 Rockville Pike, Rockville, Maryland. The public is invited to attend the Commission's meeting in person or watch live via webcast at the Web address – <https://video.nrc.gov/>.

Source Security

NRC Proposes \$8,000 Civil Penalty for Connecticut Medical Center

The Nuclear Regulatory Commission has proposed an \$8,000 fine for a Connecticut hospital for violations involving the temporary loss of a radioactive source used to calibrate nuclear medicine dosage-measuring equipment.

The NRC received a report last year that a sealed radioactive source containing cesium-137 from St. Vincent Medical Center, in Bridgeport, Connecticut, had been found at a biohazardous waste vendor's facility in Woonsocket, Rhode Island, after it set off radiation monitors. The vendor notified the hospital on Oct. 27, 2021, that it had the source and placed it into storage. St. Vincent staff determined that the source had been inadvertently disposed of as biohazardous waste, and hospital personnel retrieved it and then properly disposed of it.

Source: NRC News Release No: I-22-017
December 14, 2022

Regulatory Conference

35th NRC Regulatory Information Conference

March 14-16, 2023

Navigating the Nuclear Future

See <https://www.nrc.gov/public-involve/conference-symposia/ric/index.html>

Workforce Development & Recruitment

Hanford Site to Host Virtual Job Fair December 7 and 8

RICHLAND, Wash. – The U.S. Department of Energy Office of River Protection and Richland Operations Office, along with Hanford Site contactors and WorkSource Columbia Basin, will host a One Hanford Virtual Job Fair on Wednesday and Thursday, Dec. 7 and 8, from 10 a.m. to 3 p.m.

DOE will be joined by Hanford Site contractors Bechtel National Inc., Central Plateau Cleanup Company, Hanford Laboratory Management and Integration, Hanford Mission Integration Solutions, HPM Corporation, and Washington River Protection Solutions.

During the fair, registered attendees will have the opportunity to chat one-on-one with DOE and contractor representatives during individual virtual sessions.

Available employment opportunities include Health Physicists.

Individuals interested in attending the One Hanford Virtual Career Fair can register here:

Day 1: <https://bit.ly/3hyxRBO>

Day 2: <https://bit.ly/3A2hgfL>

Source: DOE News Release, November 28, 2022

Media Contacts:

Sydney Nachbaur, DOE, (509) 376-5761, sydney.nachbaur@rl.doe.gov

Waste Disposal Site News

WIPP - CARLSBAD, N.M. –

Employees have begun emplacing defense-related transuranic (TRU) waste in Panel 8 of EM's Waste Isolation Pilot Plant (WIPP).

Panel 8 consists of seven emplacement rooms, each measuring 33 feet wide, 16 feet high and 300 feet long, the length of a football field minus the end zones. Creating a panel requires mining nearly 160,000 tons of salt. The panel is cut out of a 2,000-foot-thick layer of salt laid down 250 million years ago by the Permian Sea.

WIPP marked a milestone last month when employees finished emplacement in Panel 7 with the last of 20,056 containers. The most common containers, 55-gallon drums, totaled almost 13,000.

Source: EM Update | Vol. 14, Issue 46 | Nov. 22, 2022

NUREG-1307, Revision 19, 11-29-2022

Report on Waste Burial Charges: Changes in Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities – Draft Report for Comment - See <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1307/r19/index.html>

Oak Ridge Advances Waste Disposal Facility as Public Outreach Continues

OAK RIDGE, Tenn. – DOE Oak Ridge Office of Environmental Management (OREM) officials reached an important milestone this fall in preparing

for a new onsite disposal facility by signing a record of decision with the U.S. Environmental Protection Agency and Tennessee Department of Environment and Conservation.

The recently signed document allows OREM and its contractor



STATE OF NEW MEXICO

Environment Department

MICHELLE LUJAN GRISHAM, GOVERNOR
James C. Kenney, Cabinet Secretary

NEWS RELEASE

For Immediate Release
December 8, 2022

Contact: Matthew Maez, Communications Director
New Mexico Environment Department
505.670.8911 | matthew.maez@env.nm.gov

NMED Issues Fact Sheet for the Waste Isolation Pilot Plant Draft Operating Permit

Draft permit enhances accountability, establishes stronger safeguards for New Mexicans

SANTA FE – Today, the New Mexico Environment Department (NMED) issued a fact sheet summarizing the department's proposed changes to the hazardous waste operating permit for the Waste Isolation Pilot Plant (WIPP) located in Carlsbad, New Mexico.

The fact sheet is an initial step in providing the permittees, the Department of Energy and Nuclear Waste Partnership, LLC, as well as interested stakeholders and members of the public an understanding of the proposed changes associated with the renewal of the WIPP hazardous waste operating permit.

NMED will release the draft WIPP hazardous waste operating permit on Tuesday, Dec. 20, 2022. Once released, NMED will open a 60-day public comment period that will run from Dec. 20, 2022 through Feb. 18, 2023.

"The New Mexico Environment Department is taking a strong stance to protect the health, environment and interests of New Mexicans," said Environment Secretary James Kenney. "The proposed permit changes clearly prioritize DOE's clean-up of legacy contamination in our state while holding the permittees accountable."

NMED is proposing several new conditions in the draft permit, including:

1. Prioritizing the disposal of legacy DOE wastes at WIPP that are generated from New Mexico clean-up activities.
2. Tying WIPP's closure to the end of the permit term (i.e., 10 years after the new permit is issued) unless the permittees can provide an accurate inventory of all remaining wastes awaiting clean-up and emplacement in WIPP.
3. Revoking the permittees state operating permit should the U.S. Congress change the federal Land Withdrawal Act to allow for increased waste emplacement at WIPP.
4. Suspending any and all waste shipments to WIPP if there are allegations or evidence of a threat to human health or the environment.
5. Requiring the DOE to submit a new annual report detailing steps toward siting another geologic repository in a state other than New Mexico.
6. Conducting surveillance of both oil and gas production wells and saltwater disposal wells operating around the perimeter of the facility.
7. Enhancing the public participation process as a permit condition.

The fact sheet released today includes a table summarizing NMED's proposed changes in the draft hazardous waste operating permit.

The WIPP facility was authorized by Congress for the disposal of transuranic (TRU) radioactive waste materials generated by atomic energy defense activities of the United States. WIPP first received a hazardous waste facility permit from NMED in 1999 to dispose of TRU mixed waste containers 2,150 feet below ground in a geologic repository. The permittees are currently operating the WIPP facility under an expired permit that is administratively extended until a new operating permit is issued. The permittees are seeking authorization for the management, storage, and disposal of TRU mixed waste at the WIPP facility.

The draft permit fact sheet is available in English and Spanish on NMED's WIPP News website at <https://www.env.nm.gov/hazardous-waste/wipp/>. Additional information will be posted to this website on Tuesday, Dec. 20, 2022.

UCOR to move forward with a final design for the facility and begin activities to prepare for its construction.

OREM hosted an information session last

week as the most recent effort to continue public outreach.

Source: EM Update | Vol. 14, Issue 48 | Dec. 13, 2022

Research Grants

NRC Awards Research and Development Grants

The Nuclear Regulatory Commission announced it is awarding 20 research and development grants totaling nearly \$10 million. These grants are part of the \$16 million appropriated by Congress in fiscal year 2022 under the University Nuclear Leadership Program authorization. NRC peer-reviewed a total of 89 research and development grant proposals.

This is the third year the NRC has offered a research component under the University Nuclear Leadership Program, which provides funding to support research and development for nuclear science, engineering, technology, and related disciplines. The grants help the NRC assess the future nuclear energy landscape and prepare for upcoming technical challenges. The intent of the grants is to develop a workforce capable of supporting the design, construction, operation, and regulation of nuclear facilities, and the safe handling of nuclear materials. Based on the peer- review evaluations, the NRC's Office of Regulatory Research recommended the following awards:

<i>Institution Name</i>	<i>City/State</i>	<i>Proposal Technical Area</i>	<i>Recommended Amount of NRC funds</i>
University of Tennessee	Knoxville, TN	Characterization of fresh and spent nuclear fuel for nuclear power plants	\$ 500,000
Louisiana State University	Baton Rouge, LA	Digital engineering/analytics, advanced sensors and controls for nuclear applications	\$ 499,865
University of Pittsburgh	Pittsburgh, PA	Advanced materials and manufacturing for nuclear applications	\$ 500,000
University of Illinois at Urbana-Champaign	Urbana, IL	Human and organizational factors and human reliability analysis for nuclear applications	\$ 499,879
Rensselaer Polytechnic Institute	Troy, NY	Characterization of fresh and spent nuclear fuel for nuclear power plants	\$ 500,000
University of New Mexico	Albuquerque, NM	Safety analyses for reactor designs and fuel cycle technologies.	\$ 500,000
University of Nevada, Reno	Reno, NV	Safety analyses for reactor designs and fuel cycle technologies.	\$ 500,000
University of Notre Dame	Notre Dame, IN	Advanced construction techniques for nuclear builds	\$ 499,942
Ohio State University	Columbus, OH	Advanced materials and manufacturing for nuclear applications	\$ 499,908
Pennsylvania State University	State College, PA	Safety analyses for reactor designs and fuel cycle technologies.	\$ 500,000

The remainder of the FY2022 UNLP funds will be allotted for scholarships, fellowships, trade schools/ community colleges and faculty development and awarded by the end of April 2023. The final research and development grant awards will be posted later this year on the NRC website.

Source: NRC News Release No: 22-049 November 30, 2022

Contact: Ivonne Couret, 301-415-8200

Low-Level Radioactive Waste Disposal 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 Compact

- 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
- Virginia

Unaffiliated States

- District of Columbia
- Maine
- Massachusetts
- Michigan
- Nebraska
- New Hampshire
- New York
- North Carolina
- Puerto Rico
- Rhode Island

Membership details available at llwforum.org/membership/

Information Resources

- 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) listserv@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 www.llwforum.org

Acknowledgment & Disclaimer

Acknowledgment: This material is based upon work supported in part by the U.S. Department of Energy under Award Numbers DE-EM0001364 and DE-em0003153.

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