

Presentation to the Latin American Section

Kenneth Petersen, ANS President

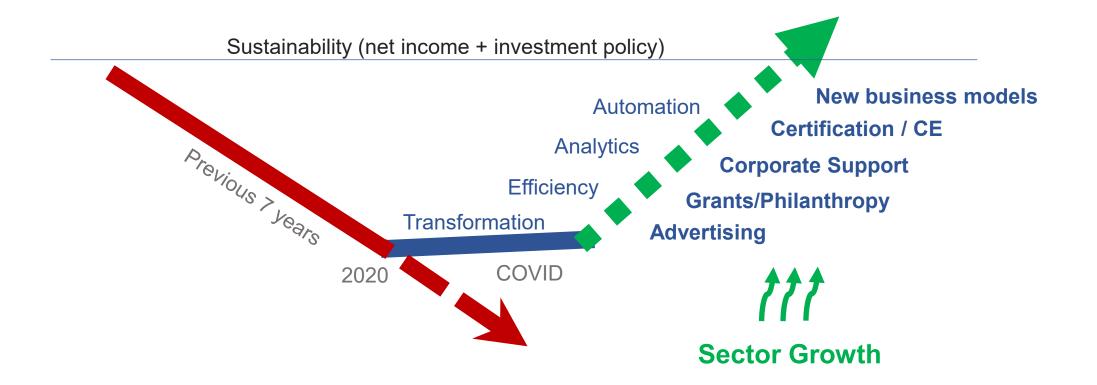
August 22, 2023

Update on American Nuclear Society

- ANS Strategic Pathway
 - New sources of Revenue
 - Membership
- K-12 Stem
- Rapid Response Taskforce
- Certification Program
- Generic Repository Standard



ANS Strategic Pathway







Raised \$354,000 to-date







Asset-Based Collaboration for Effective Engagement in Consent-Based Siting – Awarded \$1,988,614

• **Purpose**: advance the public conversation surrounding consent-based siting of consolidated nuclear materials in partnership with Minority Serving Institutions.

Powering Our Future – Awarded \$199,800

• **Purpose**: building a diverse nuclear workforce through educational outreach, engaging K-12 educators and students, state elected officials, and community members.

Advancing nuclear energy's role in addressing energy, environmental, and economic needs – Awarded \$270,000

• **Purpose**: ANS will assist Energy Communities Alliance (ECA) to ensure existing and potential host communities of nuclear projects are informed, engaged and enabled to help educate their own stakeholders.

Consent-Based Siting for Interim Storage Program – Awarded \$73,000

• **Purpose**: ANS will provide a conduit to independent community-based organizations where Society members already participate in their local schools, faith-communities, and civil society organizations.

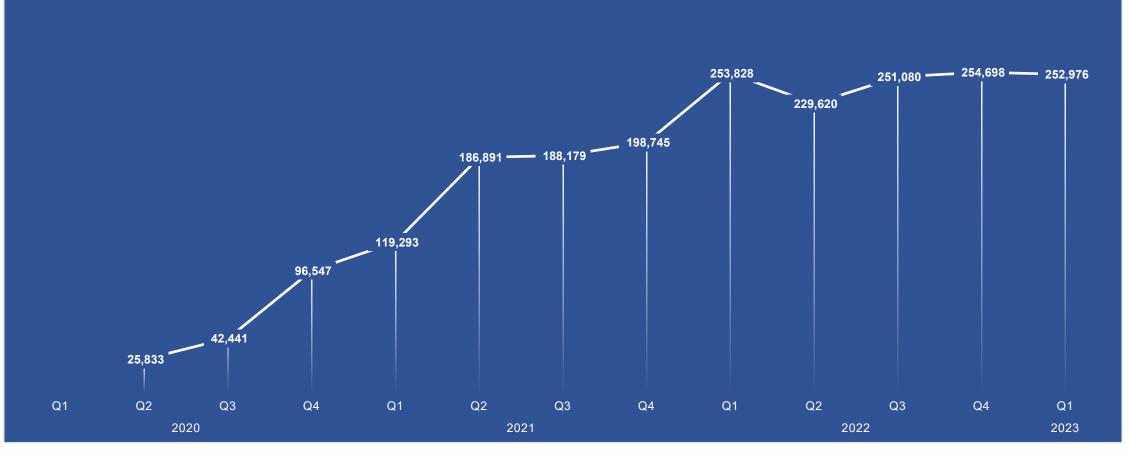
Nuclear Legislative Working Group – Awarded \$375,263

• **Purpose**: provide scientific and technical information to state legislative bodies throughout the United States.



Nuclear Newswire





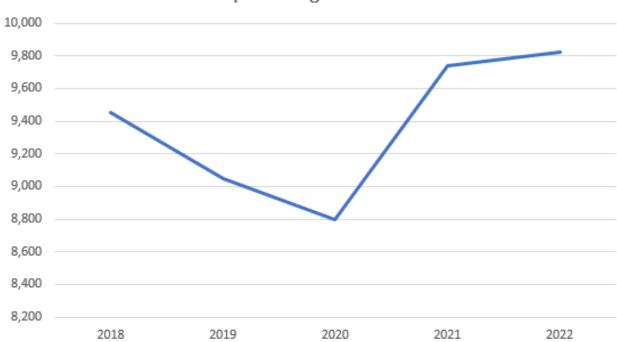


Membership Snapshot

- 9,803 Individual Members
- 103 Organization Members

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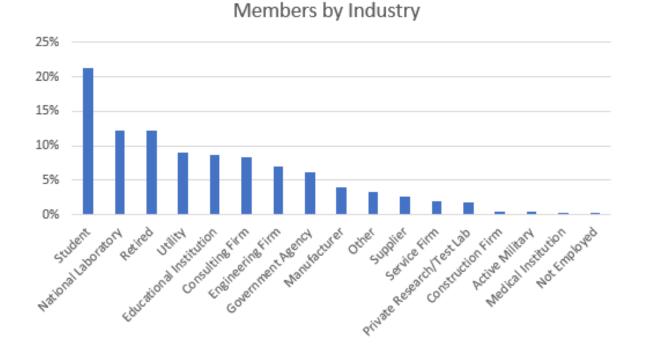
- 200+ Individual Trustee Members,
 64% of whom are in the utility sector.
- Average monthly membership counts for Jan – May are trending ahead of same period in 2022 (9973 vs 9667)



Membership - Average Counts 2018-2022

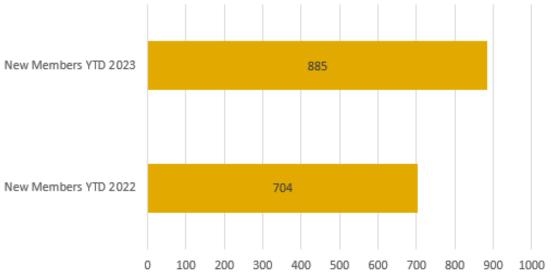


Membership Trends



Student, National Labs, & Retired remain in top three positions. Utility moves ahead of Educational Institution and Consulting Firm, driven by Trustee individual members.

New Member Counts YTD







K-12 STEM Programs

Teaching nuclear science & technology in every classroom in the nation – with a focus on under-served communities.



By-the-numbers



5,000 teachers served



1.6 million students & counting



Over **\$2 million** invested



SANS Rapid Response Taskforce

Trusted voice of independent experts







NPR Jacksonville



Another delay at planet Vogtle



Xcel Energy temporarily shutting down Monticello plant after finding another chemical leak



Turkey quake revives debate over nuclear plant being built



Ukraine's top nuclear plant lost power for the sixth time. Is disaster imminent?



Amanda Bachmann PhD student in nuclear engineering, Uni. of Illinois



Emily Caffrey

Assistant Professor of health physics, Uni. of Alabama



Andrew Whittaker

Professor of civil engineering University at Buffalo

Anonymous

Former engineer of Zaporizhzhia NPP





US nuclear enjoys revival as public and private funding pours in

POLITICOPRO

Moving Past Yucca



The U.S. Is On The Cusp Of A New Nuclear Energy Milestone — And Debate



Plant Vogtle on verge of providing power

Newsweek

Putin Still Selling U.S. Nearly \$1 Billion in Nuclear Fuel



Craig Piercy

CEO & Executive Director, American Nuclear Society



Steven Arndt

2022-23 President, American Nuclear Society



Craig Piercy

CEO & Executive Director, American Nuclear Society



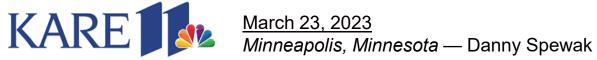
Steven Nesbit

Past President, American Nuclear Society



Steven Nesbit Past President, American Nuclear Society

Xcel Energy temporarily shutting down Monticello plant after finding another leak



No doubt, 400,000 gallons of water containing tritium represents a larger leak. But the Reporter (Voice Over): Minnesota Department of Health and other agencies say there is no evidence of a threat to the public. Reporter Do you agree with that assessment? Emily Caffrey: "I do agree with that assessment." Reporter (VO): Dr. Emily Caffrey is an expert in health physics at the University of Alabama at Birmingham. Caffrey: "It's on-site; it's not publicly accessible, so it's not a concern for public safety at this time." Reporter (VO): Caffrey notes that tritium is naturally occurring. "It's all around us: it's in our water: it's in our bodies." Caffrey: In her estimation of Monticello, even if someone drinks two liters a day for a whole year at Reporter (VO): the levels that leaked, the exposure would still be less than the background radiation that you get simply living within the U.S. Caffrey: "Really we're talking about a very, very small dose." Still, after repairs to the leak failed to work, Xcel Energy has started the process of Reporter (VO): temporarily shutting down the plant. "It is a prudent decision to shut it down early and just take care of it, so there's just not Caffrey: more leakage. They've cleaned up about a third of that tritium already. So again, [they will] monitor the situation, watch the numbers. I expect you'll see the on-site ones decrease and

I don't expect you'll see anything off-site but that's the prudent thing to do."







ANS Recommendations for New Generic Repository Environmental Standards for the U.S. - Background

- Current generic repository regulation 40 CFR part 191 is out-of-date and in many cases inconsistent with the international state-of-the-practice
- Modern, transparent standards are needed to support potential efforts to site and license a geologic repository (i.e., in addition to, or instead of, the proposed repository at Yucca Mountain)
- Multiple organizations have called for a new generic standard
 - E.g., Blue Ribbon Commission on America's Nuclear Future (2012); "Reset" committee; ANS; others
- Let's not just talk about it!
 - ANS established a Special Committee on Generic Standards for Disposal of High-Level Radioactive Waste



ANS Generic Disposal Regulations Committee

- John Kessler, chair (J Kessler and Associates, LLC)
- Lead author: **Peter Swift** (Sandia National Laboratories (retired))
- International regulations: Michael Apted (Intera)
- Characteristics of future humans: **Steve Nesbit** (LMNT Consulting)
- Lake Barrett (former head of DOE Office of Radioactive Waste)



Recommendations

- Adopt the existing Yucca Mountain regulations (40 CFR Part 197 and 10 CFR Part 63) as the starting point for new generic standards
 - Closer to current U.S. and International practice
- Specific ANS recommendations identify aspects of the existing regulations to retain or modify, and topics to add to future standards

ANS Proposed Standard will be Available Soon (on ANS website)

	40 CFR Ch. I (7-1-11 Edition)	§ 195.30
	Subpart B—Public Health and Environmental Standards for Disposal	updating examinations) and increases/ decreases in variable costs due to infla-
	 197.11 What does subpart B cover? 197.12 What definitions apply in subpart B? 197.13 How is subpart B implemented? 197.14 What is a reasonable expectation? 197.15 How must DOE take into account the changes that will occur during the period 	tion and other factors. In order to cal- culate increases/decreases in costs due to inflation, EPA may use one of the three following indices: the Federal General Schedule (GS) pay scale, the Consumer Price Index (CPI), and/or a
	of geologic stability? INDIVIDUAL-PROTECTION STANDARD 197.20 What standard must DOE meet? 197.21 Who is the reasonably maximally ex- posed individual?	component of the CPI, such as services. Second, EPA will estimate the number of participants for each program. At a minimum, these participation rates will be based on past and current pro-
	HUMAN-INTRUSION STANDARD 197.25 What standard must DOE meet? 197.35 What are the circumstances of the human intrusion?	gram participation rates. Third, EPA shall calculate the per capita costs that individuals and organizations should pay to enable it to recover its fixed and variable costs each year for
	GBOUND WATRE PROTECTION STANDARDS 197.30 What standards must DOE meet? 197.31 What is a representative volume?	each program. EPA shall also consider potential industry impacts as it ad- justs to levels to ultimately achieve full cost recovery over the period of
	ADDITIONAL PROVISIONS 197.35 [Reserved]	five years. [60 FR 41816, Aug. 14, 1995]
	197.36 Are there limits on what DOE must consider in the performance assess- ments?	§195.30 Failure to remit fee.
10 CFR Ch. I (1–1–10 Ed Subpart B—Licenses	197.37 Can EPA amend this rule? 197.38 Are the Individual Protection and Ground Water Protection Standards Sev- erable?	EPA will not process an application or continue a participant's listing in the National Radon Measurement Pro- ficiency program, individual pro-
PRRAPPLICATION REVIEW Site characterization. Review of site characterization a	APPENDIX A TO PART 197—CALCULATION OF ANNUAL COMMITTRD EFFECTIVE DOGE EQUIVALIANT AUTHORITY: Sec. 801, Pub. L. 102-486, 106	ficiency program, individual pro- ficiency component of the RMP pro- gram, or the National Radon Con- tractor Proficiency program until the appropriate remittance provided in
8. LICENSE APPLICATION	Stat. 2921, 42 U.S.C. 10141 n. SOURCE: 66 FR 32132, June 13, 2001, unless	§195.20(a) has been received by EPA. Failure by a currently EPA-listed orga-
Content of application. Filing and distribution of applic Elimination of repetition. Updating of application and en ntal impact statement.	otherwise noted. Subpart A—Public Health and En- vironmental Standards for Storage	nization or individual to remit the re- quired fees in a timely manner will re- sult in the loss of that organization's or individual's listing status as speci- fied in §195.20(c).
CONSTRUCTION AUTHORIZATION Construction authorization. Conditions of construction auth n. Amendment of construction auth n.	§197.1 What does subpart A cover? This subpart covers the storage of ra- dioactive material by DOE in the Yucca Mountain repository and on the Yucca Mountain stee.	PART 197—PUBLIC HEALTH AND ENVIRONMENTAL RADIATION PROTECTION STANDARDS FOR YUCCA MOUNTAIN, NEVADA
ICENSE ISSUANCE AND AMENDMEN [®] Standards for issuance of a licens	§197.2 What definitions apply in sub- part A?	Subpart A—Public Health and Environmental Standards for Storage
Conditions of license. License specification. Changes, tests, and experiments. Amendment of license. Particular activities requiring 1 endment.	Annual committed effective dose equiva- lent means the effective dose equiva- lent received by an individual in one year from radiation sources external to the individual plus the committed ef- fective dose equivalent.	Sec. 197.1 What does subpart A cover? 197.2 What definitions apply in subpart A? 197.3 How is subpart A implemented? 197.4 What standard munt DOE meet? 197.5 When will this part take effect?
S/IAEA SAFEGUARDS AGREEMENT	2	6
Facility information and verifica		
Facility information and verifice PERMANENT CLOSURE 63.51 License amendment for perm closure. 63.52 Termination of license.	tion in its application for emergency access or if the applicant has failed to comply with this part or any condi- tions set by the Commission pursuant to this part.	
PREMANENT CLOBURE 63.51 License amendment for perm closure, 63.52 Termination of license. Subport CParticipation by State Gc ment, And Affected Units of Local Gc ment, and Affected Indian Tribes	access or if the applicant has failed to comply with this part or any condi- tions set by the Commission pursuant to this part.	
PERMANENT CLOSURE 63.51 License amendment for perm closure. 63.52 Termination of license. Subport C—Participation by State Go ment, Affected Units of Local Go	access or if the applicant has failed to comply with this part or any condi- tions jet by the Commission pursuant to this part. PART 63—DISPOSAL OF HIGH- LEVEL RADOACTIVE WASTES IN A GEOLOGIC REPOSITORY AT YUCCA MOUNTAIN, NEYADA Subpart A—General Provisions	
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US Industry Update - The Future is Bright

A lot of great news

- Investors, including venture capital
- Bipartisan government support
- New technology and new applications
- Improved development and construction methods
- Heighten understanding of energy security



Vogtle Unit 3 and 4



- Vogtle Unit 3 started commercial operation July 31, 2023
- Vogtle Unit 4 started loading fuel August 17, 2023



Resent U.S. Government Action

- Inflation Reduction Act (IRA) Production tax credits
 - Up to \$ 15 per megawatt-hour
 - Available for facilities in service in 2024 to 2032
 - Supports the Civil Nuclear Credit program in the Bipartisan Infrastructure Law
- IRA Investment tax credits
 - From 6 percent to 30 percent
 - From 2025 to 2031 or when CO2 emission fall
- High-Assay Low-Enriched Uranium
 - IRA invests \$ 700 million to support the development of a domestic supply chain



Trending Towards SMRs

- SMRs frequently include modularity, affordability, faster construction times, enhanced safety features and can be right-sized to meet grid needs
- More flexibility in siting and can be easily shipped to remote sites
- Frequently use new fuel types



NuScale small modular reactor design NuScale LLC Photo



Some Key Announcements

- Dow announced it will install an X-energy's XE-100 HTGR at their UCC Seadrift Operations manufacturing site in Texas
- Energy Northwest announced they will build up to 12 XE-100 HTGRs next to their Columbia nuclear station.
- TVA announced it will build a GEH BWRX-300 SMR at Clinch River
- Terra Power announced they will build a Natrium reactor in Kemmerer, Wyoming
- Duke announced it will use SMR technology to replace coal plants
- Major advances in fusion
 - Lawrence Livermore performed second net positive fusion experiment
 - DOE awarded \$112M to 12 companies to support supercomputing modeling
 - DOE awarded \$46M for commercial fusion energy development



Questions?



Thank You

