



Partnership for Nuclear Energy
Strengthening America's Global Leadership in Nuclear Energy



Nuclear Energy Academic Roadmap

Guiding Your Nuclear Educational Journey

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LETTER FROM MEGHAN MILLWOOD, ORAU President and CEO

It is a pleasure to introduce the Partnership for Nuclear Energy (PNE) Nuclear Energy Academic Roadmap (NEAR), a collaborative effort aimed at strengthening the future of nuclear education and workforce capacity building in the United States. Led by the ORAU STEM Accelerator, this roadmap represents the combined expertise and dedication of educators, industry leaders, government agencies and other stakeholders working together to address one of the most pressing challenges facing the nuclear energy sector – building a skilled and resilient workforce.

The nuclear energy sector is at a turning point, with incredible opportunities to grow and innovate. The demand for clean, reliable energy is on the rise. Building a strong pipeline of skilled professionals able to meet this demand is more important than ever. The NEAR outlines how we can support students, educators and professionals at every stage of their journey, ensuring they have the tools and resources needed to succeed. By fostering collaboration across schools, universities, industries, non-profit organizations and communities, this roadmap helps pave the way to meet current and future workforce challenges.

I want to express my gratitude to everyone who contributed to the development of the NEAR. Your commitment to collaboration and innovation has been instrumental in creating a roadmap that will guide the development of the next generation of nuclear professionals. ORAU is proud to support this initiative, and I'm excited to see how it will shape the future of nuclear energy, laying the foundation for a workforce capable of driving innovation and ensuring the long-term success of nuclear energy in the United States.

A handwritten signature in black ink that reads "Meghan Millwood".

MEGHAN MILLWOOD
President and CEO, ORAU



LETTER FROM MICHELLE GOODSON, OSA Director

On behalf of ORAU and the ORAU STEM Accelerator, I want to express my deepest gratitude to the exceptional team of collaborators who made the Nuclear Energy Academic Roadmap possible. Special thanks go to Lori Brady at the Nuclear Energy Institute and Olivia Blackmon, the former director of the ORAU STEM Accelerator, for the initial vision and support, and to lead authors Sue Magidson and Lyn Potter for their dedication and expertise in bringing this effort to life. Thank you to the many contributors and advisors who brought diverse perspectives and deep knowledge to the project. Coming from academic institutions, industry organizations and government agencies, this group's collective efforts enriched the roadmap and ensured it reflects the multifaceted needs of the nuclear energy sector.

This collaboration exemplifies the power of teamwork and shared purpose. By bringing together voices from across academia, industry and government, we've created a document that is not only comprehensive but also uniquely positioned to address challenges and opportunities in nuclear education and workforce development. To everyone who contributed their time, insights, and passion – thank you for helping to shape a resource that will guide the future of nuclear energy in the United States.

A handwritten signature in black ink that reads "Michelle Goodson". The script is fluid and cursive.

MICHELLE GOODSON, SHRM-SCP
Director, ORAU STEM Accelerator

INTRODUCTION

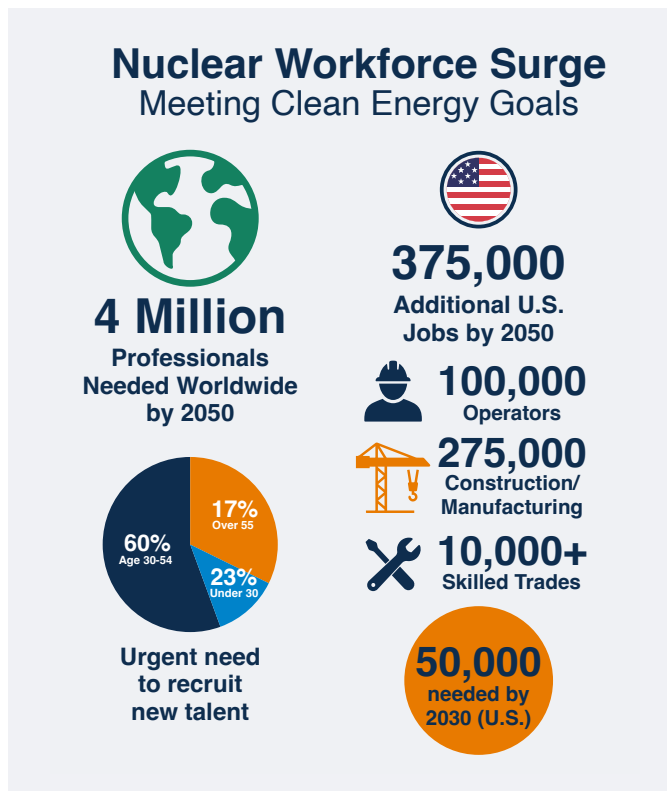
The U.S. nuclear energy sector is at a crucial juncture, presenting exciting opportunities to grow and strengthen its workforce. As the demand for carbon-free, reliable energy continues to grow, the need to attract and retain highly skilled workers becomes increasingly important. Addressing this challenge is essential to achieving a clean energy future and supporting the deployment of advanced reactors, modernization of regulatory frameworks, licensing improvements, and a resilient supply chain. To meet future energy needs, the U.S. Department of Energy (DOE) projects the sector will require over 375,000 skilled workers by 2050 to sustain ongoing nuclear power operations and continue next-generation reactor deployment.¹ Further critical needs for skilled nuclear workers are in the national security and environmental management sectors, which draw from the same workforce as nuclear energy. Additionally, the transition of an aging academic workforce underscores the importance of cultivating new talent and effectively transferring knowledge to the next generation.

Recognizing these needs, key industry organizations are coming together to develop proactive solutions. One such initiative is the Nuclear Energy Academic Roadmap (NEAR), which aims to strengthen pathways into nuclear careers, enhance educational infrastructure, and inspire a new generation of leaders in the field.

METHODOLOGY

To tackle the shortage of nuclear workers, workshops were held to brainstorm ideas on how to improve educational programs from early childhood education to higher education. These workshops aimed to find the best approaches to improve these programs. Goals included enhancing career awareness and pipeline development, assessing the financial support and other resources that academic institutions need, and optimizing academic resources including exploring new ideas to enrich education.

A total of 144 academic institutions participated, including 17 Kindergarten to 12th Grade (K-12) schools, 63 technical and community colleges, and 64 four-year institutions. Contributors were invited to participate based on their knowledge and interest in nuclear educational programs. They joined virtual sessions and used an online tool to provide feedback. Over 800 comments were collected and summarized by the ORAU Assessment and Evaluation team. The responses were categorized, themes identified, and subthemes elaborated through summaries, new ideas, and quotes from respondents. This information was documented in a qualitative analysis.



Graphic Credit: Lyn Potter and Nuclear News

The qualitative analysis helped create a framework that shaped the organization and structure of the roadmap. Four strategic priorities emerged: Enhancing Nuclear Career Awareness; Supporting Pipeline and Pathway Development; Identifying Financial Support, Resources and Programs; and Optimizing Academic Resources Through Collaboration. A description of each is below.

- **Enhancing Nuclear Career Awareness** informs people about various jobs, career paths, and earning potential. It aids students in choosing careers in the nuclear industry and helps employees find growth opportunities.
- **Supporting Pipeline and Pathway Development** aims to grow the nuclear workforce by linking individuals to education training and career opportunities that support advancement at every stage.
- **Identifying Financial Support, Resources, and Programs** ensures that financial barriers do not hinder students from pursuing careers in the nuclear field and guarantees the continuity and effectiveness of educational programs.
- **Optimizing Academic Resources Through Collaboration** involves sharing adaptable educational coursework and tools, equipment, and facilities among learning institutions to save time and money while helping to ensure consistent learning experiences across various educational settings.

Initially, these priorities were assigned to six groups: K-12, Vocational-Technical Schools, Community Colleges, Four-year Academic Institutions, Advanced Studies, and Professional Development. Based on this structure, a summary or synopsis was prepared to outline the main messages and recommendations for each group within each priority. Upon further review, it was observed that several of the recommendations for Vocational-Technical Schools and Community Colleges were nearly identical, as were the recommendations for Four-year Academic Institutions and Advanced Studies. Therefore, a decision was made to merge the Vocational-Technical Schools with Community Colleges and Four-year Academic Institutions with Advanced Studies, reducing the number of groups to four.



THE NUCLEAR ENERGY ACADEMIC ROADMAP: A CONTINUOUS JOURNEY



This roadmap represents a journey that begins with a child's first exposure to science concepts and continues through decades of professional growth. Each educational level builds upon the previous while preparing learners for the next phase, creating a seamless progression from curiosity to expertise. Understanding these connections is essential for stakeholders at every level, from elementary teachers introducing basic energy concepts, to senior executives mentoring working professionals throughout their careers.

The following sections trace this educational journey, beginning with the foundational years that shape initial interest and understanding. While each level has unique characteristics and challenges, the four strategic priorities remain consistent throughout, adapted to meet the specific needs and capabilities of learners at each stage. While there may be some overlap, readers are encouraged to explore recommendations beyond their immediate interests, as useful advice might be found elsewhere.

Two appendices are provided. The first appendix identifies all recommendations in the NEAR and specifies whether they require national action or can be addressed at the regional or local level. The second appendix presents a strategic approach for implementing selected recommendations, with further examples to be added in future updates of the NEAR.



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The Final Ascent:

From Academic Excellence to Professional Success

Transitioning from academia to professional practice is the climax of the educational journey where theoretical knowledge, research experience, and practical skills merge to create effective nuclear professionals. This stage also marks the beginning of life-long learning that is needed due to the ever-evolving nature of the nuclear industry.

New graduates bring fresh knowledge and perspectives but often lack the practical experience and institutional knowledge that comes only through professional practice. Conversely, seasoned professionals have valuable operational insight but may need help staying updated with technological advances. This dynamic creates opportunities for mutual learning and knowledge transfer within the nuclear workforce.

With many experienced workers nearing retirement, transferring knowledge and planning for succession are crucial to maintain industry standards. Professional development must therefore focus on integrating new talent while preserving institutional knowledge, creating a continuous cycle of learning to strengthen the industry.



THE ROLE OF PROFESSIONAL DEVELOPMENT

The nuclear energy sector faces growing challenges in retaining skilled professionals due to competition from other STEM industries that may offer more flexible work environments and broader career options. This challenge is further compounded by an aging workforce and the growing demand for nuclear expertise as the industry expands to meet clean energy goals.

Professional development is essential for career advancement, skill enhancement, and maintaining competitiveness in a rapidly evolving job market. Continuous learning through specialized training and certifications helps individuals stay current with new technologies and best practices, while also boosting job satisfaction and career mobility.

For professionals transitioning from other fields, tailored programs are necessary to enhance their knowledge, bridge skill gaps, and provide hands-on experience. Collaboration between industry, academia, and government is crucial to support these transitions.

As the industry evolves, training programs must be regularly updated to reflect advancements in reactor technology, safety protocols, and digital tools, ensuring that the workforce remains agile and well-prepared.

SUMMARY OF FINDINGS:

PROFESSIONAL DEVELOPMENT IN NUCLEAR WORKFORCE DEVELOPMENT

1. **Mentorship Programs:** There is a lack of structured mentorship for early career professionals and new hires, resulting in inadequate support for onboarding and knowledge transfer. The absence of clear goals, regular check-ins, and feedback mechanisms in these programs exacerbates the issue.
2. **Leadership Development:** Mid-career and high-performing employees are not receiving sufficient leadership training, which hampers their ability to advance in their careers. Employees should be trained to effectively communicate, make decisions, engage stakeholders, and manage risks.
3. **Flexible Learning Platforms:** Access to e-learning platforms and modular training programs is needed for all workforce segments, especially those balancing work and education. Expanded access should include interactive content, mobile accessibility, and integration with certification pathways.
4. **Competency-Based Training Aligned with SAT:** Competency-based training should be aligned with the Systematic Approach to Training (SAT) to ensure consistent development of competencies for technical staff and operations personnel. This includes job task analysis, performance-based assessments, and periodic requalification.
5. **Career Pathways and Succession Planning:** Transparent career pathways that outline progression opportunities, required skills, and training milestones should be made available to all employees with an emphasis on retention and advancement. Succession planning should identify and prepare future leaders through targeted development plans and rotational assignments.
6. **Expanding the Talent Pool:** To strengthen the future workforce and drive innovation, recruitment strategies should target individuals across various fields and geographical areas. Key outreach partnerships may include veteran initiatives, career transition services, and minority-serving institutions.



7. **Training Continuous Improvement:** Training and human resources professionals should use data analytics to evaluate training effectiveness, identify skill gaps, and guide continuous improvement. Metrics should include learner performance, retention rates, and post-training job performance.
8. **Cross-Disciplinary and Cross-Industry Exchanges:** Encouraging exchanges for mid- to senior-level professionals and technical specialists with other industries like aerospace, defense, and digital tech can bring new perspectives and innovative practices to nuclear training. These exchanges can include temporary assignments, joint training sessions, and collaborative projects.

COLLABORATION MODELS TO SUPPORT PROFESSIONAL DEVELOPMENT

To support professional development, several collaboration models should be established. Examples include:

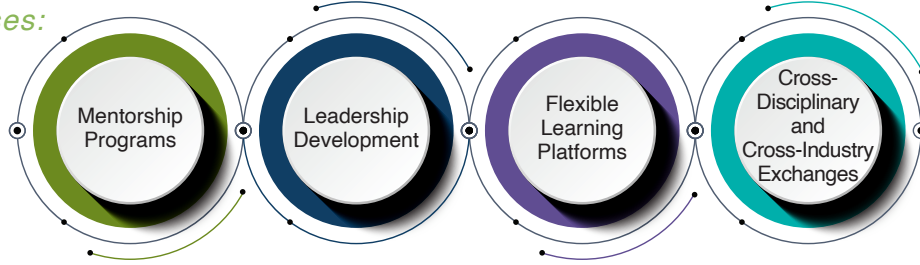
- **Industry-Academia Partnerships:** Collaborate with universities and technical colleges to co-develop curricula, offer joint certifications, and provide access to research facilities.
- **Government-Industry Initiatives:** Leverage federal and state programs to fund workforce development, such as DOE grants or apprenticeship programs.
- **Public-Private Consortia:** Form consortia that bring together utilities, vendors, regulators, and educators to align training standards, share resources, and coordinate outreach.
- **Cross-Sector Learning Networks:**
Establish learning networks that include professionals from healthcare, cybersecurity, and manufacturing to share best practices in safety, digital transformation, and workforce resilience.





Strategic Priority 1: Enhancing Nuclear Career Awareness

Addresses:



RECOMMENDATIONS:

- **Implement Targeted Communication Strategies:** Use e-newsletters, digital portals, and social media to promote training, certifications, and advancement opportunities. Tailor messaging to different career stages and roles.
- **Establish Comprehensive Career Services:** Provide career counseling, mentoring, and transition support to help workers identify advancement paths, retrain, or shift roles within the industry.
- **Develop Centralized Digital Platforms:** Expand platforms like NuclearWorks.org to include interactive tools (e.g., career maps, assessments, success stories) that guide users through career options and educational pathways.
- **Foster Membership in the Partnership for Nuclear Energy (PNE) Advisory Council:** The PNE Advisory Council will be comprised of representatives from academia, government agencies, and industry leaders to address issues impacting the industry, including professional development.





Strategic Priority 2: Supporting Pipeline and Pathway Development

Addresses:



RECOMMENDATIONS:

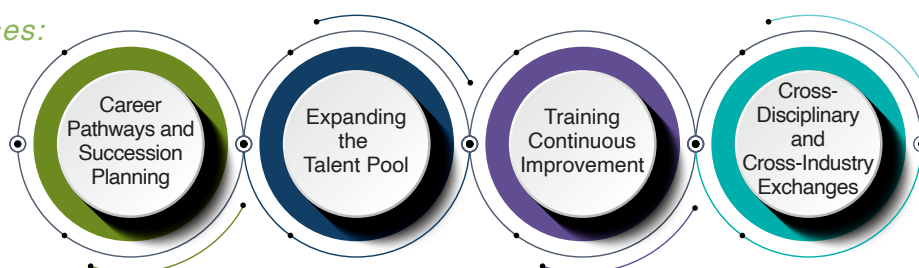
- **Expand Nuclear-focused Training Access:** Create flexible, regionally accessible training pathways tailored to a broad pool of learners, including career-changers, adult learners, and others entering the nuclear industry through nontraditional pathways, to welcome emerging talent and build workforce capacity across the region. Use regional hubs for local deployment of solutions.
- **Develop Stackable Credentials:** Create modular certification programs that allow workers to build expertise progressively and demonstrate competencies at each career stage.
- **Establish Regional Training Hubs:** Develop regional centers of excellence for nuclear training, equipped with specialized facilities and resources shared across to multiple organizations.
- **Update Training Curriculum Regularly:** Collaborate with industry to ensure training content reflects current technologies, regulatory changes, and operational needs.
- **Integrate Sociotechnical Competencies:** Include training on the political, ethical, environmental, and financial dimensions of the nuclear energy industry to prepare workers for career advancement.
- **Create Career Mapping Tools:** Design interactive digital guides that help workers visualize career paths, required skills, and advancement opportunities.
- **Expand Experiential Learning:** Include hands-on activities, simulations, real-world projects, and mentorship opportunities into training opportunities.
- **Formalize Mentorship and Peer Learning:** Establish structured mentorship programs and peer learning forums to facilitate knowledge transfer and professional growth.
- **Support Career Transitions:** Establish Department of Labor-certified pre-apprenticeship and apprenticeship programs to help workers transition into or advance within the nuclear field.
- **Offer Detail Assignments and Rotational Programs:** Offer opportunities for temporary assignments, cross-training, and job rotations so workers can gain hands-on experience in different roles and departments.
- **Leverage Veteran Experts:** Launch outreach and mentorship programs that highlight the valuable, transferable skills of veterans and seasoned professionals, enriching the nuclear talent pipeline.

- **Integrate Advanced Learning Technologies:** Use XR and simulation-based modules to enhance training effectiveness and provide immersive, risk-free learning environments.
- **Track Outcomes and Share Success:** Monitor participation, completion, and career progression; use feedback to refine programs and publicize success stories to inspire new entrants.



Strategic Priority 3: Identifying Financial Support, Resources, and Programs:

Addresses:



RECOMMENDATIONS:

- **Advocate for Dedicated Funding Streams:** Work with policymakers and stakeholders to secure long-term funding for outreach, education, and workforce development initiatives.
- **Centralize Funding Information:** Create a user-friendly portal listing scholarships, grants, and internship opportunities specific to nuclear education and training.
- **Offer Financially Supportive Programs:** Provide tuition reimbursement, paid training leave, and certification support to encourage upskilling without financial burden.
- **Develop a Strategic Sustainability Plan:** Outline long-term goals, identify funding gaps, and implement strategies to maintain and grow financial support for workforce initiatives.
- **Leverage Career Centers and Online Resources:** Partner with educational institutions and workforce centers to expand access to job boards, resume workshops, and career planning tools.
- **Encourage Professional Association Memberships:** Reimburse membership fees for nuclear professionals to access training, networking, and industry-specific resources.





Strategic Priority 4: Optimizing Academic Resources Through Collaboration

Addresses:



RECOMMENDATIONS:

- **Strengthen Academic-Industry Partnerships:** Build coalitions between educational institutions, government, and industry to co-develop curricula, share facilities, and align training with workforce needs.
- **Create an Open Educational Resource Repository:** Develop a centralized platform for sharing adaptable, high-quality nuclear education materials across institutions.
- **Establish a Consortium for Online Learning:** Collaborate across organizations to create and distribute online courses and lab simulations, ensuring consistent access to advanced training.
- **Promote a Culture of Continuous Learning:** Encourage ongoing professional development through mentorship, cross-functional collaboration, and self-directed learning supported by flexible digital tools.
- **Develop Introductory and Open-Source Courses:** Standardize beginner-level modules and make them freely available to broaden access and support early engagement.
- **Incorporate Experiential and Immersive Learning:** Use XR-enhanced courses and digital learning environments to simulate real-world scenarios and improve skill retention.
- **Institutionalize Mentorship Programs:** Create adaptable mentorship frameworks that align with organizational culture, include training for mentors, and measure program effectiveness.



COMPLETING THE JOURNEY: A HOLISTIC APPROACH TO NUCLEAR WORKFORCE DEVELOPMENT



The professional development phase completes the nuclear workforce pipeline while also contributing to its renewal. Experienced professionals act as mentors, interactive presenters, and industry advisors for academic programs at every level, offering real-world insights that enrich classroom learning and inspire the next generation of nuclear professionals. This relationship—where industry professionals contribute to educational programs that, in turn, prepare their future colleagues—creates a sustainable ecosystem for nuclear workforce development.

The success of this system relies on strong, ongoing partnerships among all stakeholders: K-12 educators who plant the seeds of interest, vocational school/community college instructors who develop practical skills, university faculty who advance scientific knowledge, and industry professionals who apply this knowledge to address real-world challenges. Each level supports and depends on the others, creating a robust pipeline that can adapt to changing industry needs while maintaining the high standards of safety and excellence characteristic of the nuclear profession.

As the nuclear industry encounters new opportunities, from advanced reactor deployment to the growing recognition of nuclear energy's role in addressing global challenges, the strength of this educational pipeline will determine whether the U.S. can capitalize on these opportunities. The recommendations in this roadmap provide a framework for strengthening each stage in the pipeline, ensuring robust and effective connections between levels to support student achievement and highlight the success of workforce development initiatives.

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Appendix A

Nuclear Energy Academic Roadmap Recommendations

The following four tables correspond to the Strategic Priorities outlined in the NEAR report. Each table presents a set of recommendations, categorized by group, and identifies whether it should be addressed at the national level, regional/local level, or both. To avoid redundancy, overlapping recommendations within the Strategic Priorities have been consolidated.

Strategic Priority 1: Enhance Career Awareness

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Expose K-12 Students to Nuclear Energy Fundamentals	●				●	
Integrate Nuclear Career Exploration into Curriculum	●				●	
Develop Unified Messaging Across Education Levels to Address Misconceptions and Promote the Benefits of Nuclear Energy	●	●	●		●	●
Highlight a Range of Professional Journeys	●	●	●		●	●
Develop a Digital Hub		●	●		●	●
Integrate Nuclear Career Pathways into Academic Programs		●	●		●	
Offer or Expand Experiential Learning Opportunities		●	●	●	●	
Provide or Enhance Career Counseling and Support Services		●	●	●	●	
Establish Nuclear Industry Ambassador Programs		●	●			●
Enhance Career Services and Mentorship Networks		●	●		●	
Create Interactive Career Pathway Tools		●			●	
Foster Community and Industry Engagement		●			●	
Develop Tiered Communication Strategies			●		●	●
Implement Targeted Communication Strategies				●	●	

Strategic Priority 1: Enhance Career Awareness, continued

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Develop Centralized Digital Platforms				●	●	●
Foster Tri-Sector Partnership Councils			●	●	●	●
Strengthen Recruitment and Support Programs for Veterans and Emerging Talent		●	●	●	●	●

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Develop Reproducible STEM Programs	●				●	●
Partner Educators with Industry Experts	●				●	
Introduce Nuclear Safety Culture	●				●	
Offer or Expand Experiential Learning Opportunities and Bootcamps	●	●	●	●	●	●
Implement Multi-Channel Outreach	●	●	●		●	●
Expand Dual Enrollment and Early College Programs		●			●	
Develop Stackable Credential Programs and Certificates		●	●	●	●	●
Support for Emerging Talent		●	●		●	●
Develop Internships and Mentorship Programs and Alumni Networks		●	●		●	●
Establish Pre-Apprenticeship and Apprenticeship Programs		●			●	●
Foster Academic Pathways and Transfers and Formalize Transfer Pathways		●		●	●	
Integrate Advanced Nuclear Technologies into Curricula		●	●	●	●	●
Implement Data Collection Program and Track Outcomes and Share Successes			●	●	●	●

Strategic Priority 2: Support Pipeline and Pathway Development, continued

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Integrate Sociotechnical Competencies in Curriculum			●	●	●	●
Provide Research Placement Opportunities			●		●	●
Develop Leadership-Focused Graduate Programs			●		●	
Promote Faculty Exchanges and Industry Externships			●		●	
Establish Industry Advisory Boards		●	●		●	
Broaden Access to Training				●	●	●
Establish Regional Training Hubs				●	●	●
Update Training Curriculum Regularly				●	●	
Create Career Mapping Tools				●		●
Formalize Mentorship and Peer Learning				●	●	
Offer Detail Assignments and Rotational Programs				●	●	
Leverage Professional Expertise				●	●	
Integrate Advanced Learning Technologies into Training				●	●	

Strategic Priority 3:

Identify Financial Support, Resources, and Programs

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Develop a Centralized Funding Portal	●	●	●	●		●
Engage Industry and Government Partners	●	●	●		●	●
Expand Student Financial Support, Financial Aid, and Subsidized Programs	●	●	●		●	●
Develop a Strategic Sustainability Plan to Secure Long-Term Funding	●	●	●	●	●	●
Coordinate Work-Study and Part-Time Opportunities		●			●	
Provide Wraparound Support Services		●			●	
Pursue Collaborative Grant Opportunities		●	●		●	
Identify and Secure Funding		●			●	
Secure Long-Term Funding Commitments			●		●	●
Support Educator Development		●	●		●	●
Advocate for Dedicated Funding Streams				●	●	
Offer Financially Supportive Programs				●	●	●
Leverage Career Centers and Online Resources				●	●	
Encourage Professional Association Memberships				●	●	

Strategic Priority 4: Optimize Academic Resources Through Collaboration

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Raise Awareness and Promote Existing Programs	●				●	
Create an Open Educational Resource Repository	●	●	●	●	●	●
Develop Standardized Introductory Courses		●	●	●	●	●
Establish a Consortium for Online Learning	●				●	
Develop National Teaching Guidelines	●					●
Foster/Promote a Culture of Continuous Learning	●	●	●	●	●	
Form Inter-Institutional Partnerships		●	●		●	
Expand Access to Shared Facilities and Leverage Federal Reactor and Training Programs		●	●		●	●
Establish and Institutionalize Faculty Mentorship Networks		●	●	●	●	
Invest in Faculty Development		●			●	
Host Curriculum Innovation Summits		●	●		●	●
Establish a National Advisory Board at the Federal Level		●	●			●
Establish Academic Consortia			●		●	●
Develop Train-the-Trainer and Pedagogical Programs			●		●	

Strategic Priority 4: Optimize Academic Resources Through Collaboration, continued

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Strengthen Academic-Industry Partnerships				●	●	
Establish a Consortium for Online Learning				●	●	●
Incorporate Experiential and Immersive Learning				●	●	



Appendix B

Nuclear Energy Academic Roadmap Example Implementation Methods, Tools and Resources

The following four tables align with the Strategic Priorities outlined in the NEAR Report. The tables include example recommendations, implementation strategies, and possible tools and resources. Future updates of the NEAR Report will provide more examples.

Strategic Priority 1:

Enhance Career Awareness

Recommendation: Develop Unified Messaging Across Education Levels to Address Misconceptions and Promote the Benefits of Nuclear Energy

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Collaborate with non-governmental organizations (e.g., NEI, ANS, EPRI, ORAU PNE) and academic partners to standardize messaging • Develop a national branding campaign to promote the benefits and career pathways of nuclear energy • Develop and distribute informational materials (e.g., brochures, videos, digital content) tailored for diverse audiences • Ensure all outreach materials highlight current and emerging career opportunities in the nuclear sector • Share resources with schools, community organizations, and workforce partners nationwide • Host career fairs, webinars, and information sessions for students, families, and community members	• Nuclear industry websites - American Nuclear Society (ANS): https://www.ans.org/ - Nuclear Energy Institute (NEI): https://nei.org/ - World Nuclear Association: https://world-nuclear.org/ - International Atomic Energy Agency (IAEA): https://www.iaea.org/ - Nuclear Regulatory Commission (NRC): https://www.nrc.gov/ - Nuclear Innovation Alliance: https://nuclearinnovationalliance.org/ • Educational curricula and learning resources - ANS Navigating Nuclear Curriculum • National Energy Education Development curriculum • Virtual nuclear reactor tours (video or 3D) • Digital media and communication platforms - Social media platforms (e.g., LinkedIn, X, Instagram, TikTok) - Video hosting platforms (e.g., YouTube, Vimeo) - Podcasts focused on science, technology, and energy - Online webinar platforms (e.g., Zoom, Microsoft Teams) • Public engagement opportunities - National Science Week and other STEM-focused public events - Virtual or in-person outreach sessions for schools and community groups

Strategic Priority 1: Enhance Career Awareness, continued

Recommendation: Highlight a Range of Professional Journeys

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Create video interviews and written profiles of professionals from varied backgrounds • Share stories through university, industry, and social media channels • Hold community events and school visits highlighting the benefits of a diverse workforce • Partner with professional societies for outreach events • Partner with institutions and schools serving a wide range of students	• Online platforms for hosting webinars (e.g., Zoom) • Social media platforms • Video hosting platforms (e.g., YouTube) • Industry conference • School-sponsored events • Nuclear Science Week • Boy and Girl Scouts merit badge workshops

Recommendation: Integrate Nuclear Energy Awareness into Broader STEM initiatives

Groups	Implementation Strategies	Tools & Resources
K-12	• Partner with STEM organizations to create and incorporate nuclear energy modules • Develop nuclear energy-focused workshops and activities at STEM fairs and events	• STEM organizations (e.g., Project Lead the Way, For Inspiration and Recognition of Science and Technology, Women in Science, ORAU K-12 STEM Education Programs) • STEM curricula providers • STEM fair organizers • Online learning platforms • National Science Week toolkits

Strategic Priority 1: Enhance Career Awareness, continued

Recommendation: Provide or Enhance Career Counseling and Support Services

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Establish formal career counseling and mentoring programs • Offer resume workshops and interview coaching • Host career fairs and information sessions • Maintain a job/internship board specific to nuclear careers • Assign dedicated career counselors • Establish mentorship programs tied to professional organizations	• Career offices and staff • American Nuclear Society: ans.org • Nuclear Energy Institute: NuclearWorks.org • Center for Energy Workforce Development: cewd.org/resources, getintoenergy.org • Nukeworker.com/job

Recommendation: Provide Research Placement Opportunities

Groups	Implementation Strategies	Tools & Resources
University	• Establish formal agreements for student research placements • Create joint research projects and internships • Establish summer research internships at national labs • Promote student participation in DOE/NEUP and NRC-funded projects	• Existing legal and partnership frameworks • Placement coordinators

Recommendation: Strengthen Recruitment and Support Programs for Veterans and Emerging Talent

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Partner with veterans' organizations and develop veteran-specific outreach and transition programs • Highlight transferable skills in recruitment activities • Offer scholarships and transition support (e.g., targeted transition workshops) • Offer credit for military experience	• Veterans Affairs offices – liaison staff • Transition program guides • Partnerships with Veteran groups • Industry mentors

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation: Create/Offer/Expand Experiential Learning Opportunities and Bootcamps

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Partner with organizations that have created internship, mentorship, and summer programs for students • Integrate AR/VR modules in education and training • Host virtual reality tours and simulations • Integrate industry site visits, hands-on labs, and facility tours into curriculum • Partner with industry to obtain case studies for use in the classroom	• Existing experiential learning frameworks (e.g., Kolb's Experiential Learning Cycle) • Immersive learning tools (e.g., GE Hitachi Virtual Reality Solution, AR Deni) • Online learning platforms (e.g., Riipen.com) • Educational websites and databases (e.g., IAEA's Nuclear Energy Education Resource Hub, ScienceEducation.gov) • Simulations and interactive tools (e.g., PhET Interactive Simulations) • Virtual nuclear reactor tours (video or 3D)

Recommendation: Develop or Enhance Internship and Mentorship Programs and Alumni Networks

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University	• Expand partnerships with companies for internship and co-op placements • Develop formal mentorship networks • Establish a phased internship program with pre-and post-internship activities to better prepare and retain students • Formalize and establish a communication plan for mentorship programs • Encourage graduate students to act as mentors • Organize peer learning forums and technical exchanges	• University career services and alumni associations • Professional organizations (e.g., ANS) • Government agencies and programs (e.g., NRC, DOE) • Online platforms and software (e.g., Engage2Serve, Pathways to Career Success, Zintellect.com)

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation: Develop Stackable Credential Programs and Certificates

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Partner with academic institutions, trade unions, and workforce boards • Develop curriculum and certification standards • Advertise availability of programs/ certificates	• “Stackable Credentials Tool Kit- Mapping Upward”, Center for Occupational Research and Development, April 2018 • Apprenticeship program templates • Certification bodies • Industry trainers

Recommendation: Provide Research Placement Opportunities

Groups	Implementation Strategies	Tools & Resources
University	• Establish formal agreements for student research placements • Create joint research projects and internships • Establish summer research internships at national labs • Promote student participation in DOE/NEUP and NRC-funded projects	• Existing legal and partnership frameworks • Placement coordinators • Utilize existing resources like the DOE ORISE Program and Zintellect.com

Recommendation: Integrate Advanced Nuclear Technologies into Curricula and Update Training Curriculum Regularly

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Contact nuclear organizations (e.g., NEI, ANS), to identify subject matter experts from industry and academia • Partner with subject matter experts and create modules to be used in established courses or summer programs	• NRC training materials • EPRI programs • Online DOE STEM Resources • Workshops (e.g., DOE/NNSA and Gateway for Accelerated Innovation in Nuclear (GAIN))

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation: Establish Industry Advisory Boards

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University	• Define purpose and scope of the board • Work with professional organizations to identify and recruit members • Establish clear expectations and structure • Create an onboarding process • Manage board activities and outcomes	• Existing advisory boards and committees (e.g., TN Nuclear Energy Advisory Council, Advisory Committee on Reactor Safeguards, PNE Advisory Council) • Federal Advisory Committee Act • NRC Best Practices and Guidelines Reports to Congress

Strategic Priority 3: Identify Financial Support, Resources, and Programs

Recommendation: Develop a Centralized Funding Portal

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Coordinate with industry and government agencies to collect information on funding opportunities • Contact nongovernmental agencies or not-for-profit organizations to determine who would manage and maintain the database and set up its functionality • Create and launch a database listing scholarships, grants, and internship opportunities • Regularly update and promote funding opportunities to students and educators • Offer application workshops to students	• Development frameworks • Management software • Funding discovery and tracking tools • Web analytics • Social media management • Generative AI • NSF – Advanced Technical Education - Mentoring services for grant writing: - Mentor Connect: http://mentor-connect.org - Mentor Links: http://www.aacc.nche.edu/programs/mentorlinks/ - Mentor Up: https://atementorup.org

Recommendation: Develop a Centralized Funding Portal Engage Industry and Government Partners

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Partner with industry to provide in-kind and financial support of nuclear education programs and resources • Partner with government agencies for financial support of nuclear education programs and resources	• Requests for Information • Industry days • One-on-one meetings • Industry and government association meetings • Trade groups • Conferences • NSF-ATE Business and Industry Leadership Team: https://connectedtech.org/business-industry-leadership-team/

Strategic Priority 3: Identify Financial Support, Resources, and Programs

Recommendation: Expand Student Financial Support, Financial Aid, and Subsidized Programs

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Increase university and industry-sponsored scholarships • Apply for federal and state grants	• Promote and expand federal and state financial aid programs • Institutional scholarships and grants • Tuition assistance programs • Employer and Union assistance programs • Online scholarship databases (e.g., scholarships.com, financialaidtoolkit.ed.gov)

Recommendation: Develop a Strategic Sustainability Plan to secure long-term funding

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Develop long-term funding strategies • Advocate for government and industry investment • Seek grant funding	• Building partnerships and collaborations • Online courses and workshops • Guidance from experts

Recommendation: Support Educator Development

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Establish partnerships across academic institutions and identify educator needs • Create summer externships • Create research opportunities for educators	• Online learning platforms and courses • Professional development organizations, such as ORAU K-12 STEM Educator Programs • Conferences, workshops, bootcamps • Collaboration and mentorship

Strategic Priority 4: Optimize Academic Resources Through Collaboration

Recommendation: Create an Open Educational Resource Repository

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	- Determine which non-governmental or not-for-profit organization will create, manage, and maintain repository - Evaluate existing open educational platforms and perform a gap analysis to identify unmet needs - Collaborate with industry and government agencies to collect, curate, and develop high-quality curriculum materials - Develop a searchable online database - Promote and communicate availability of resource repository to educators, institutions, and stakeholders	- Existing open educational resource platforms such as: - IAEA's e-learning platform - IAEA NUCLEUS information resource portal - DOE Fundamentals Handbook - Open Educational Resource: oercommons.org - Open.edu/openlearncreate - MIT OpenCourseWare - DOE's website: energy.gov/doe-stem - NRC's website: https://www.nrc.gov/reading-rm/ - ANS's website: nuclearconnect.org - Nuclearscienceweek.org - Idaho National Laboratory (INL) Education Resources: inl.gov/education - NSF-ATE Regional Center for Nuclear Education & Training: https://gonuke.org/ - ORAU K-12 STEM Education Lesson Plans: https://orau.org/k12/educator/lesson-plans.html

Recommendation: Develop Standardized Introductory Courses

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	- Establish a partnership with representatives from academia, industry, and government - Perform foundational planning - Develop course content and learning activities - Establish a peer review process - Collect feedback and make improvements	- Existing open educational resource platforms - Existing introductory courses from selected universities and organizations

Strategic Priority 4: Optimize Academic Resources Through Collaboration

Recommendation: Foster/Promote a Culture of Continuous Learning

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Offer micro-credentials • Host regular professional development seminars • Encourage attendance at conferences and seminars • Encourage lifelong learning incentives	• Existing technology including online learning platforms, VR/AR, data analytics, mentorship programs • In-house workshops, seminars, and on-the-job training • Government and industry specialized training (e.g., Westinghouse Nuclear)

Recommendation: Establish and Institutionalize Faculty Mentorship Networks

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Evaluate and expand existing mentorship programs and networks to support new training initiatives • Facilitate knowledge transfer between institutions through formal or informal agreements • Pair emerging programs with experienced mentors to guide curriculum and workforce alignment • Provide guidance on program development based on best practices	• Mentorship guides and handbooks • Mentorship programs and models (e.g., National Research Mentoring Network)

