

# **VIRGINIA NUCLEAR ENERGY CONSORTIUM AUTHORITY**

## **2019 Annual Report**

Commonwealth of Virginia

Department of Mines,  
Minerals and Energy

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## EXECUTIVE SUMMARY

### **Charge and Responsibilities**

In 2013, the General Assembly created the Virginia Nuclear Energy Consortium Authority (the Authority) as a political subdivision of the Commonwealth for the following purposes:

- Making Virginia a national and global leader in nuclear energy, science and technology;
- Serving as an interdisciplinary study, research and information resource for nuclear energy in Virginia; and
- Establishing the Virginia Nuclear Energy Consortium (the Consortium), a non-stock corporation responsible for conducting activities to achieve these goals.

This, the Authority's 2019 Annual Report, details its activities over the last year and offers strategic recommendations to advance nuclear energy in Virginia in 2020 and beyond.

### **Authority Activities in 2019**

Since its establishment and organization in 2013, the Authority has worked diligently to:

- Set goals and define the responsibilities for the Authority and the Consortium;
- Recruit members to the Consortium, securing commitments from companies and higher education institutions;
- Maintain an annual inventory of nuclear education and industry assets in Virginia, illustrating that the nuclear sector is helping drive Virginia's economy in every region, with high skilled jobs, research and technology development and generation of revenue at both the state and local level;
- Provide technical support and policy recommendations to the development of the Virginia Energy Plan and its biennial status updates;
- Provide information and expertise to stakeholders, elected and non-elected officials, and policymakers at all levels of government; and
- Establish the Authority as a convening body for information on the current state of the nuclear industry in the Commonwealth, nationwide and globally.

In 2019, the Authority and the Consortium worked together to set a path forward for support of nuclear energy in Virginia following the release of the Virginia Energy Plan which did not include recommendations for nuclear energy. This included coordinated activity to chart a specific direction which focused on the “Virginia is Nuclear” Summit in August.

The summit hosted by the Consortium and the Virginia Economic Development Partnership (VEDP) focused on workforce, infrastructure, and research & development as drivers of Virginia’s nuclear innovation. Attendees had an understanding of the state of the nuclear industry in the Commonwealth, both currently and, with an eye toward the future. The summit focused on Virginia’s role as a leader in the nuclear industry and ways to ensure it remains a leader in advancing new nuclear technologies that could be developed here in the Commonwealth.

We are quickly entering a time of significant potential opportunity for nuclear energy and the Summit’s resulting recommendations will ensure that Virginia is positioned to grab that opportunity and maintain its position as a leader.

### **Strategic Recommendations for 2020 and Beyond**

The Authority and the Consortium recommend the Governor and the Legislature support the following actions in 2020:

**1. Define “Clean” and “Carbon Free” Energy**

Currently, there is not a “clean energy” or “carbon-free energy” standard in the Code, despite it being in Virginia’s best interest to move toward energy sources with zero carbon emissions. The Code of Virginia should define “clean energy” or “carbon-free energy” as any energy source that has zero carbon emissions, such as nuclear or renewables (energy from sunlight, wind, falling water, biomass, waste, landfill gas, municipal solid waste, wave motion, tides, and geothermal power). Secondly, the code should direct the Department of Mines, Minerals & Energy (DMME) to give nuclear energy equal treatment to renewable energy sources as it pertains to clean or carbon-free energy initiatives, including economic development programs.

**2. Prioritize Nuclear Energy**

On September 17, 2019, Governor Northam issued Executive Order Number 43, which established the goal of producing “100 percent of Virginia’s electricity ... from carbon-free sources such as wind, solar and nuclear” by 2050. To do so, the General Assembly should direct the Secretary of Commerce & Trade, Secretary of Education, and the DMME to work in coordination with VNECA and the VEDP to develop a strategic plan for nuclear energy as part of the Commonwealth’s overall strategy for renewable and carbon-free energy.

**3. Promote Nuclear Energy Infrastructure and the Capacity for Advanced Nuclear R&D**

Work with the Authority, Consortium and VEDP to identify and implement specific programs to attract investment in new advanced nuclear such as; an advanced

nuclear research center, university scholarship and R&D programs, small modular or advanced reactor projects, infrastructure for new nuclear development or exports and collaboration with national labs, ARPA-E and other universities.

4. **Continue to Support Nuclear Energy Education and Workforce Development**

The Authority is grateful for the efforts of the Governor and legislature to establish the 17<sup>th</sup> Career Cluster around Energy. Next we should task the State Council of Higher Education for Virginia (SCHEV), in conjunction with the Authority, with developing programs to support innovation in the nuclear industry and to promote education in fields that meet the future workforce demands of the nuclear industry, including manufacturing, nuclear medicine, energy production, and defense applications.

## INTRODUCTION

Virginia is home to tremendous nuclear energy assets. The Commonwealth's commitment to reliable, clean, low-cost nuclear energy is a significant economic and workforce driver, promoting cutting-edge research and development; employing thousands of highly skilled, well-paid workers; and expanding higher education programs for a stronger future in every corner of Virginia.

To capitalize on these existing strengths, the General Assembly in 2013 created the Virginia Nuclear Energy Consortium Authority (Authority) as a political subdivision of the Commonwealth for the purpose of establishing Virginia as a national and global leader in nuclear energy and providing an interdisciplinary study, research and information resource for nuclear energy in Virginia. The Authority was also charged with establishing the Virginia Nuclear Energy Consortium (Consortium), a non-stock corporation responsible for collaborative activities in pursuit of these goals.

As required by Code of Virginia § 67-1403, the Authority submits this 2019 annual report including a summary of its activities and strategic recommendations for the support and expansion of the nuclear energy industry in Virginia, to the Governor and the Chairmen of the House Appropriations Committee, the Senate Finance Committee and the House and Senate Commerce and Labor Committees.

Since its creation in 2013, the Authority has worked diligently to 1) Set goals and define the responsibilities for the Authority and the Consortium; 2) Recruit members to the Consortium, securing commitments from several companies and higher education institutions; 3) Produce an annual inventory of nuclear education and industry assets in Virginia; 4) Provide technical support and policy recommendations for the development of the Virginia Energy Plan and its biennial status update; 5) Provide information and expertise to stakeholders, elected and non-elected officials, and policymakers at all levels of government.

## MISSION AND PRIORITIES

The Authority's mission is to establish the Commonwealth as a national and global leader in nuclear energy; to serve as an interdisciplinary study, research, and information resource for the Commonwealth on nuclear energy, science and technology issues; and to establish the Virginia Nuclear Energy Consortium (Consortium) to facilitate private sector activities and partnerships with our higher education institutions to advance these goals. The Authority evaluated and allocated responsibilities and priorities to either the Authority or the Consortium, as appropriate.

### **Responsibilities**

The Authority is the public body responsible for communicating with the state government, the Governor's Office, and the General Assembly; providing direction for the Consortium; and receiving reports and progress updates from the Consortium. The Consortium is a non-profit entity for responding to commercial, research and education needs and interests of the industry. It is overseen and directed by the Authority and is the entity that conducts day-to-day activities to promote and advance Virginia's nuclear industry.

The statute passed by the General Assembly enumerated various charges for the Authority and the Consortium.

The Authority has the following responsibilities:

- 1) Develop strategic recommendations to guide activity from year to year.
- 2) Provide direction to the Consortium established by the Authority.
- 3) Facilitate, where possible, public information and communication about nuclear energy and related educational and job opportunities.
- 4) Develop and maintain an inventory of Nuclear Assets Justifying Position of Leadership.
  - a) Workforce
  - b) Private Entities
  - c) Research and Federal Labs
  - d) Public Universities and Educational Programs
- 5) Serve as an expert voice for Government.
  - a) Notification of Congressional Delegation of Board and Resources
  - b) An information resource for policy makers at all levels

The Authority assigned the following responsibilities to the Consortium:

- 1) Promote and facilitate agreements among public and private institutions of higher education in the Commonwealth and other research entities to carry out research projects relating to nuclear energy, science and technology;
- 2) Identify and support, in cooperation with Virginia's nuclear entities and the public and private sectors, the development of education programs related to Virginia's nuclear industry;
- 3) Develop a policy regarding any interest in intellectual property that may be acquired or developed by the Consortium;
- 4) Facilitate the collaboration of members toward the attainment of grants and the expenditure of funds;
- 5) Encourage, facilitate, and support the application, commercialization, and transfer of new nuclear technologies;
- 6) Provide advice, assistance, and services to institutions of higher education and to other persons providing services or facilities for nuclear research or graduate education; and
- 7) Foster innovative partnerships and relationships among the Commonwealth, the Commonwealth's public institutions of higher education, private companies, federal laboratories, and not-for-profit organizations to accomplish the purposes set out by this chapter.

The statute also provides for communication of nuclear-related information and research results. The Authority believes that the two organizations should share this responsibility.



## 2019 GOALS AND ACTIVITIES

The Authority identified several specific goals as priorities for their 2019 activities:

- 1) Continue to enhance strategic priorities to serve as a roadmap for future activity.
- 2) Continue to stress the importance to the Commonwealth of nuclear energy as a major source of zero carbon generation.
- 3) Continue to expand existing coordination and identify new opportunities for collaboration and support between VNECA and VNEC.
- 4) Support efforts to retain existing nuclear assets and investments in Virginia.
  - a) Support positive regulatory climate to preserve existing assets
  - b) Support public policy initiatives to enable investments needed to preserve existing and new nuclear assets
- 5) Provide technical expertise and promote greater awareness amongst policymakers of the role nuclear energy can play in the Commonwealth's environmental and energy initiatives.
  - a) Utilize the Authority platform to bring increased information sharing opportunities about the state of the nuclear industry.

### **Key Activities Conducted in 2019**

#### **Asset Inventory**

To better understand and communicate the significant impact of the nuclear industry on Virginia's economy and workforce, the Authority maintains an inventory of nuclear assets in Virginia including private industry, utilities, educational institutions, and federal research laboratories. The Authority reviews the inventory quarterly.

The key findings from the asset survey are highlighted by the following summary. The full database of nuclear energy assets, including company employment and annual revenue figures, can be found in Appendix A.

#### **The Critical Role of Nuclear Energy in Virginia's Economy**

Virginia is a leader in clean energy production with nearly 32% of the Commonwealth's power coming from zero emission nuclear power. Operating at more than 95% capacity, nuclear generation provides reliable, inexpensive electricity to Virginia consumers and helps keep our energy costs low, making Virginia a competitive location for existing and

new business. However, that is only the beginning of the story of nuclear energy in Virginia's economy. A recent preliminary economic asset survey, produced by the Authority, reveals:

- The nuclear energy sector is driving Virginia's economy in every region, offering highly skilled jobs, supporting research and technology advancement and generating revenues at the state and local level.
- Dominion operates four nuclear units in Virginia: two at the North Anna Power Station in Louisa County, and two at Surry Power Station in Surry County. In addition to their substantial contribution to Virginia's energy mix, these four units collectively employ more than 2,000 professionals at an average salary of more than \$80,000 per year. These four units supply the majority of Virginia's carbon free electricity and are substantial economic drivers for their host regions.
  - In October 2018, Dominion applied to the Nuclear Regulatory Commission for a 20-year license extension for its Surry nuclear power station and told the federal regulatory agency that it plans to operate the plant until 2053. The company has announced similar intention to file for extension of the North Anna nuclear power station in 2020.
- Virginia is home to facilities and operations of half a dozen global leaders in the nuclear energy sector. They include Framatome Inc. (Lynchburg), BWX Technologies, Inc. (Lynchburg), NovaTech (Lynchburg), Bechtel (Reston), Dominion (North Anna and Surry) and Newport News Shipbuilding (Newport News).
  - In October 2019, Framatome acquired Christiansburg-based FoxGuard Solutions, a company dedicated to the field of integrated cybersecurity, industrial computing, and regulatory compliance solutions. FoxGuard will become Framatome's center of expertise in cybersecurity for North America.
  - Also in October 2019, Framatome relocated its SPEC 200 manufacturing facility from China to Lynchburg.
  - BWX Technologies, Inc. (BWXT) has been selected by NuScale Power to conduct the design for manufacturability engineering work for NuScale's small modular reactor (SMR) nuclear power module.
- Two major federal facilities located in Virginia – NASA Langley and the Norfolk Naval Shipyard – are active in research, development and the use of nuclear technology. Between the Naval Shipyard and Newport News Shipbuilding, the nation's nuclear-powered Navy has its home in Virginia.
- Dozens of other companies, located all across Virginia, provide services, supplies and support to these major Virginia facilities. Testing services, materials and

supplies, security, engineering services and much more are provided to the industry by Virginia businesses.

- These companies operate and employ Virginians in towns as diverse as Abingdon, Alexandria, Arlington, Ashland, Chantilly, Charlottesville, Chester, Colonial Beach, Fairfax, Goochland, Hampton, Lynchburg, McLean, Mechanicsville, Roanoke and Virginia Beach to name but a few.
- Because many of these Virginia businesses have operations around the country and the world, it is difficult to determine total jobs and revenue numbers for Virginia alone, but it is likely the number exceeds 100,000 jobs across the Commonwealth and tens of billions of dollars that are tied directly to the nuclear energy sector. These generate substantial state and local tax dollars.
- Virginia Tech, Virginia Commonwealth University (VCU), the University of Virginia (UVA) and Old Dominion University have established degree programs and research relationships to train the next generation of expertise and leadership needed to support the nuclear energy sector in the U.S. and around the world.
- The universities, labs and industrial base in Virginia are involved in cutting-edge, nuclear-related research and development that will drive the Virginia nuclear economy of the future.
- Virginia's existing nuclear assets and capabilities make it a prime location for next generation reactors, and the Commonwealth and industry should work together to attract investment in those technologies.

Additionally, the Authority performed a survey of nuclear engineering degrees, programs and related fields of study at Virginia public and private universities (Appendix A). In addition to the established degree programs at Virginia Tech, VCU, UVA and Old Dominion, many institutions, such as Virginia Military Institute and Central Virginia Community College, offer numerous nuclear energy, nuclear medicine and other related programs, degrees and research.

### **Virginia is Nuclear Summit**

In 2018, the Authority and Consortium made recommendations for the Virginia Energy Plan. The recommendations were not included nor was there any discussion on nuclear energy in the final plan. Due to the significant contribution of nuclear energy to the Commonwealth, the Authority and Consortium engaged a strategy to better educate and promote nuclear energy in Virginia.

The effort resulted in the Virginia is Nuclear Summit in August that was hosted by the Consortium and the Virginia Economic Development Partnership. Authority Chairman Tom DePonty provided welcome remarks and context for the Summit.

The recommendations described at the beginning of this report are a direct result of the Summit and will provide the strategic direction for 2020 and beyond.

### **2019 Authority Meeting Activities**

The Authority held four meetings in the past fiscal year (November 29, 2018, March 06, 2019, May 09, 2019, and September 12, 2019). Over the course of the year, the group considered several activities on which to focus their work efforts, including:

- Completion/submission of the 2018 Virginia Nuclear Energy Consortium Authority Annual Report to the Governor and members of the General Assembly by December 20, 2018.
- The Authority strove for better engagement with the Northam Administration's climate change policies and actions.
- Promotion and support of the 2019 American Nuclear Society Student Conference from April 6-9 hosted by Virginia Commonwealth University Communication with other energy authorities to determine common goals and opportunities for collaboration.
- The continued promotion of nuclear energy as a vital component in zero emissions electricity generation in the combat against global climate change.
- Communicating the importance of having a diverse energy portfolio that is flexible and resilient is key to sustainable energy and a strong economy
- Continued efforts on educating members via technical and informational presentations, or engaging in advocacy work to focus on nuclear as a vital component of Virginia's energy mix; and
- Updates on nuclear energy policy in other States that may serve as an example for or have an impact on nuclear energy activity in Virginia.

### **Presentations**

The Authority hosted educational sessions for its members at their 2019 meetings, as follows:

- **ANS Student Conference** Co-Chairs Daniell Tinchler & Sarah Morgan presented ANS Student Conference Theme "Nuclear is\_\_\_\_\_." The "blank" was intentionally left to be filled in by participants as to how they would define nuclear. Highlights of conference presentation:
  - Conference held April 4-6, 2019 on VCU campus in Richmond
    - <http://studentconf.ans.org/>
  - 100 Nuclear professionals attended
  - 100% Student Organized

- Global Representation
- Included: workshops, poster sessions, tours, dinners, Nuclear Science Fair for High School Students\*
  - \*ANS Student co-chairs requested assistance from VNECA members to provide Inter-Active Displays for Nuclear Science Fair.

➤ **VA 17<sup>th</sup> ENERGY CAREER CLUSTER** <http://vaenergy17thcluster.org/> - **Matt Kellam:** VEWC - Virginia Energy Workforce Consortium (<http://www.vewc.org>) with CEWD – Center for Energy Workforce Development (<http://www.cewd.org>) work at state level to drive home activity and results that create energy career awareness and promote / implement energy awareness that would lead to energy related careers. Currently there are 16 established career clusters with the proposed 17<sup>th</sup> cluster focused on energy.

➤ **Joshua Saks, Deputy Secretary of Natural Resources**

- Briefed the authority on the administration’s current carbon mitigation initiatives (CMI) welcoming an open dialogue with the authority.
- Authority requested suggestions for making nuclear a part of the CMI discussions stressing its important role in these initiatives.

➤ **Tom Dolan, Director of Operations, Virginia Program Office for Recycling & Disposition of SNF**

- Presented case on why Virginia is perfect to lead the effort in opening facility for recycling spent nuclear fuel (SNF)
- Outlined next steps involved:
  - Establish Program Office for Spent Nuclear Fuel Recycling & Disposition
  - Enact detailed program plan
  - Need Virginia Governor and Congressional Delegation to consent to accepting SNF
  - Request VNECA sponsorship at upcoming American Nuclear Society’s Winter National Meeting and Expo in Washington D.C., November 17-21, 2019

## AUTHORITY ADMINISTRATION

### **Virginia Nuclear Energy Consortium Authority Administration**

The Virginia Nuclear Energy Consortium Authority Board elected the following slate of officers to lead the Board for 2019:

Chairman – Tom DePonty

Vice Chairman – Gary Tepper

Treasurer – Eugene Grecheck

Secretary – Bob Bailey

The full list of Authority Board Members is included in Appendix B.

Additionally, the Authority maintains a webpage on the Secretary of Commerce and Trade's website that serves as an information resource for nuclear energy in Virginia and the activities of the Authority. Authority Website -

<https://commerce.virginia.gov/initiatives/va-nuclear>

## VIRGINIA NUCLEAR ENERGY CONSORTIUM UPDATE

The Virginia Nuclear Energy Consortium (the Consortium) was formally launched in 2015 and now has been in operation for over three years in accordance with Section 67-1404 of the laws of the Commonwealth. The full 2019 Consortium activity report and membership roster are included as Appendix C.







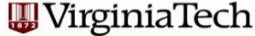
## Appendix A:

# Virginia Nuclear Energy Asset Inventory and Educational Institutions





## Nuclear in Virginia: Educational Institutions

Updated 4/30/2019

Entity	Logo	Nature of Activity	Applicable Program(s)	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Christopher Newport University		Public Liberal Arts University	Applied Physics (B.S.), Computational and Applied Mathematics (B.S)	Paul S. Triple Jr, President	Christopher Newport University, 1 Avenue of the Arts, Newport News, VA 23606	1961	166.5 (total revenue FY12)	~400 faculty	<a href="http://www.cnu.edu">www.cnu.edu</a>
George Mason University		Public University	Systems Engineering (B.S.), Applied and Engineering Physics (M.S.)	Ángel Cabrera, President	4400 University Dr, Fairfax, VA 22030	1957	911 budget (FY14)	1,801 (includes part-time FTE)	<a href="http://www.gmu.edu">www.gmu.edu</a>
Liberty		Private University	Mechanical Engineering (B.S.)	Jerry Falwell, Jr.	1971 University Blvd, Lynchburg, VA, 24515	1971		~2,500 faculty	<a href="http://www.liberty.edu">www.liberty.edu</a>
University of Virginia		Public Research University, Health System	Physics (Ph.D, MS, MA, MAPE, BS, BA), Division of Nuclear Medicine	Teresa A. Sullivan, President	Charlottesville, VA 22904-4203	1819	1,410 (academic division, FY13-14)	8,311	<a href="http://www.virginia.edu">www.virginia.edu</a>
Virginia Commonwealth University		Public Research University, Health System	Nuclear Engineering Concentration (B.S), Nuclear Engineering (M.S., Ph.D.), Department of Radiation Sciences	Michael Rao, President	821 West Franklin St, Richmond, VA, 23284	1838	967.4 budget (FY13 14)	20,241 (incl. medical center)	<a href="http://www.vcu.edu">www.vcu.edu</a>
Virginia Community College System		Community College Network	Engineering (AS), Engineering Technology (ASS)	Glenn DuBois, Chancellor	101 N. 14th Street, 15th Floor, Richmond, VA, 23219	1966	1,276 (total revenue FY13)	11,000+ total faculty	<a href="http://www.vccs.edu">www.vccs.edu</a>
Virginia Polytechnic Institute and State University		Public University, Research Institution	Nuclear Engineering Program (Ph.D., MS,ME)	Dr. Timothy D. Sands, President	Blacksburg, VA, 24061-0002	1872	1,284.3 budget (FY13)	7,263	<a href="http://www.vt.edu">www.vt.edu</a>



## Nuclear in Virginia: Federal Research Laboratories

Updated 4/30/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Thomas Jefferson National Accelerator Facility		Nuclear Physics Research	Stuart Henderson, Director	12000 Jefferson Ave, Newport News, VA 23606	1984	\$162.1M (FY18)	700	<a href="http://www.jlab.org/">www.jlab.org/</a>
US Navy (Norfolk Naval Shipyard)		Manufacturing, R&D, and support for US Navy	Capt. Mark Bridenstine, Commander	Norfolk Naval Shipyard, Portsmouth, VA, 23709	1767	1,016 (FY11-12)		<a href="http://www.navsea.navy.mil/shipyards/norfolk/">www.navsea.navy.mil/shipyards/norfolk/</a>


## Nuclear in Virginia: Utilities

Updated 6/3/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Dominion Resources		Power Generation, Transmission, Distribution	Thomas F. Farrell II	One James River Plaza (OJRP), 701 East Cary Street, Richmond, VA, 23219	1983	13,120 (FY13)	14,500 (total)	<a href="http://www.dom.com">www.dom.com</a>
Old Dominion Electric Cooperative		Electricity Provider	Jackson Reasor, President and CEO	4201 Dominion Blvd, Glen Allen, VA, 23060	1948	842.1 (FY13)	~100	<a href="http://www.odec.com/">www.odec.com/</a>












## Nuclear in Virginia: Private Industry

Updated 6/3/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Abbitz Measurement, Inc.		Pressure Systems Instrumentation	Tammy Nicoll, President	1619D Diamond Springs Rd, Virginia Beach, VA, 23455	2009		~10-20	<a href="http://www.abbitz.com">www.abbitz.com</a>
ABZ, Inc.		Fluid Flow Consulting	Ed Abbott, President	4451 Brookfield Corporate Drive, Suite 101, Chantilly, VA, 20151	1986		~10	<a href="http://www.abzinc.com">www.abzinc.com</a>
Action Technology, Inc.		Staffing, Consulting, Training	Bonnie Lonon, President and CEO	3121 E. Boundary Ct., Midlothian, VA, 23112	1982	24	~250	<a href="http://www.action-tech.com">www.action-tech.com</a>
Advex Corporation		Machining and Fabrication	George Hill Jr, President	121 Floyd Thompson Drive, Hampton, VA, 23666	1969		180	
Aerofin		Heat transfer applications supplier	David Corell, President	4621 Murry Place, P.O. Box 10819, Lynchburg, VA, 24502	1923			<a href="http://www.aerofin.com">www.aerofin.com</a>
Affordable Fastener Supply Company		Hardware Supply	Carl Grunthner, President and CEO	312-G Old York Hampton Highway, Yorktown, Virginia, 23692	2005			<a href="http://www.affordablefast.com">www.affordablefast.com</a>
Air Systems, Inc.		Filtration, Air Systems	David Angelico, President	821 Juniper Crescent, Chesapeake, VA, 23320			42	<a href="http://www.airsystems.cc">www.airsystems.cc</a>
AMEC		Engineering, Project Management, Consulting	Samir Brikho, CEO	14424 Albemarle Point Place, Suite 115, Chantilly, VA, 20151; 1070 West Main St, Suite 5, Abingdon, VA, 24210; 2028 Dabney Rd, Suite E-18, Richmond, VA, 23230; One Colubums Center, Suite 600, Virginia Beach, VA, 23642	1982	6,735 (FY13)	~27,000	<a href="http://www.amec.com">www.amec.com</a>
American Operations Corp.		Analysis, Consultancy, Specialist Services	L. Frank 'Smokey' Field, Chairman and CEO	14030 Thunderbolt Place, Suite 700, Chantilly, VA, 20151	1983		~200	<a href="http://www.aocwins.com">www.aocwins.com</a>
Applied Technical Services		Nondestructive Testing	Jim Hills, President	2312 Commerce Center Drive, Suite A, Rockville, VA 23146; 5566 General Washington Drive, Alexandria, VA, 22312; 1325-B Cavalier Blvd, Chesapeake, VA	1967		~600	<a href="http://www.atslab.com">www.atslab.com</a>
Ares Security Corporation		Security Consulting and Applications	Ben Eazzetta, President	8045 Leesburg Pike, Suite 400, Tysons Corner VA 22182	2012		850+ (incl. ARES Holding)	<a href="http://www.aressecuritycorp.com">www.aressecuritycorp.com</a>
Axiom Quality Assurance		Consulting and Analysis		P.O. Box 328, McLean, VA, 22101				<a href="http://www.axiomqa.com">www.axiomqa.com</a>
Bauer Compressors, Inc.		Compressors and High Pressure Systems	Tony Bayat, President	1328 Azalea Garden Rd, Norfolk, VA 23502	1946			<a href="http://www.bauercomp.com">www.bauercomp.com</a>
Bechtel		Engineering, Construction	Brendan Bechtel, Chairman & CEO	12011 Sunset Hills Rd, Reston, VA, 20190	1898	37,900 (FY12)	53,000+ (total)	<a href="http://www.bechtel.com/">www.bechtel.com/</a>














## Nuclear in Virginia: Private Industry

Updated 6/3/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Beta Analytics International, Inc.		Access Control, Security, Fire Protection	Darden Hood, President	2677 Prosperity Avenue, Suite 400, Fairfax, VA, 22031	1979		~300	<a href="http://www.radiocarbon.com">www.radiocarbon.com</a>
Boh Environmental, LLC		Container Systems	Eric Hediger, President	14520 Avion Pkwy, Chantilly, VA 20151  800 Main Street, Lynchburg 2016 Mt. Athos, Lynchburg	1998		~15	<a href="http://www.bohifupsystems.com">www.bohifupsystems.com</a>
BWX Technologies, Inc.		Nuclear design, engineering, manufacturing and services	Rex D. Geveden, President and CEO	1570 Mt. Athos, Lynchburg 109 Ramsey Place, Lynchburg  110 Ramsey Place, Lynchburg  107 Vista Centre Drive, Forest	Company history dates back to 1856	\$1,800 million (\$1.8 billion) (CY2018)	6,250 in North America	<a href="http://www.bwxt.com">www.bwxt.com</a>
Caliper Inc.		Staffing and Recruitment	Robert Y. Green, Jr, President and CEO	512 Central Drive, Virginia Beach, VA, 23454; 4907 Fitzhugh Ave, Suite 201, Richmond, VA, 23230; 11325 Random Hills Rd, Suite 360, Fairfax, VA, 22030	1984			<a href="http://www.caliper.net">www.caliper.net</a>
CBG, LLC		Metal Disintegration & Stud Removal	Ken Guthrie, Owner	4013 Seaboard Court, Suite A-3, Portsmouth, VA, 23701	2002			<a href="http://www.cbgmaintenance.com">www.cbgmaintenance.com</a>
Chemetrics, Inc.		Water Testing	Bruce H. Rampy, President	4295 Catlett Rd, Midland, VA, 22728	1969		55+	<a href="http://www.chemetrics.com">www.chemetrics.com</a>
CMC Technical		Staffing and Recruitment		502 Viking Drive, #102, Virginia Beach, VA, 23452	1978			<a href="http://www.cmc-jobs.com">www.cmc-jobs.com</a>
Coastal Network of Virginia, LLC		Radiation Safety		600 Plantation Ct, Charlottesville, VA, 22903	1987		5	<a href="http://www.nuclearsupply.com">www.nuclearsupply.com</a>
Communications-Applied Technology		Communication Systems Design and Manufacturing	Seth Leyman, President and Founder	11250-14 Roger Bacon Drive, Reston, VA, 20190	1982		~15	<a href="http://www.c-at.com">www.c-at.com</a>
CraneTech Solutions CTS		Cranes & Lifting Equipment	Frank Hegan, President	2030 Ponderosa St, Portsmouth, VA, 23701	1958			<a href="http://www.ct-sol.com">www.ct-sol.com</a>
Dominion Engineering, Inc.		Technical Consulting Services	Robert D. Varrin, JR, Ph.D, Principle Officer	12100 Sunrise Valley Drive, Suite 220, Reston, VA, 20191	1980		<50	<a href="http://www.domeng.com">www.domeng.com</a>
Donley Technology		Environmental Health and Safety Information	Elizabeth M. Donley, Founder and Executive Director	P.O. Box 152, Colonial Beach, VA, 22443	1988			<a href="http://www.donleytech.com">www.donleytech.com</a>















## Nuclear in Virginia: Private Industry

Updated 6/3/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
DynCorp International		Security Training and Consulting	Steven F. Gaffney, Chairman and CEO	1700 Old Meadow Road, McLean, VA 22102	1946	~3,000 (FY10)	16,800 (2009)	<a href="http://www.intellpros.com">www.intellpros.com</a>
Eddy Current Technology, Inc.		Eddy Current Testing		201A Horace Ave, Virginia Beach, VA, 23462				<a href="http://www.eddy-current.com">www.eddy-current.com</a>
Electric Motor and Contracting Company, Inc.		Motor repair, decontamination, refurbishment	James L. King, President CEO	3703 Cook Blvd, Chesapeake, VA, 23323	1960	~30	~200	<a href="http://www.emc-co.com">www.emc-co.com</a>
Excel Services Corporation		Consulting, Technical Services	Donald R. Hoffman, President and CEO	11921 Rockville Pike, Suite 100, Rockville, MD, 20852	1985			<a href="http://www.excel-services.com/">www.excel-services.com/</a>
F.N. Anderson & Associates		Engineering Analysis and Services	Floyd N. Anderson, President	87 Braxton Lane, Forest, VA, 24551	1993		~4	<a href="http://www.fnaai.com">www.fnaai.com</a>
Finite Matters, Ltd.		Management Solutions, Consulting, Software	Anthony Luca, Owner	3064 River Road West, Suite B, Goochland, VA, 23063	1991		<10	<a href="http://www.fml.com">www.fml.com</a>
Flowserve		Pumps, Valves, Tubing	Mark A. Blinn, President and CEO	5114 Woodall Rd, Lynchburg, VA 24502	1997	4,954 (FY13)	15,000+	<a href="http://www.flowserve.com">www.flowserve.com</a>
Framatome Inc.		Engineering, Design, Manufacturing, Nuclear Services and Support	Gary Mignogna, President and CEO	Corporate Headquarters 3315 Old Forest Road Lynchburg, VA 24501  Solutions Complex	1958	~\$1 billion	2,300	<a href="http://www.framatome.com">www.framatome.com</a>
Fuji Electric America		Power Electronics Technology	Michihiro Kitazawa, President and Chairman (Fuji Global)	5115 Bernard Drive, Suite 102, Roanoke, VA, 24018 (Drives and Inverters Dept.)	1923	7,315 (consolidated sales FY12)	~25,000	<a href="http://www.fuji-electric.com">www.fuji-electric.com</a>
Honeywell (Uvex Safety Frames)		Safety Products, Eye + Face Protection	David M. Cote, Chairman and CEO	690 HP Way, Chester, VA, 23836	1906	37,665 (FY12)	~132,000 (worldwide)	<a href="http://www.honeywellsafety.com">www.honeywellsafety.com</a>
Huntington Ingalls		Shipbuilding, Nuclear Operations, Engineering Services	Mike Petters, President and CEO	4101 Washington Ave., Newport News, VA, 23607	2008	6,800 (FY13)	39,000+ (total)	<a href="http://www.huntingtoningalls.com">www.huntingtoningalls.com</a>
ICF International, Inc.		IT Services, Research, and Consulting	Sudhakar Kesavan, Chairman and CEO	9300 Lee Hwy, Fairfax, VA, 22031	1969	949 (FY13)	4,500+	<a href="http://www.ici.com">www.ici.com</a>
Innerspec Technologies		Engineering Consultant	Borja Lopez, CEO	2940 Perrowville Rd, Forest, VA 24551	1989		58	<a href="https://www.innerspec.com">https://www.innerspec.com</a>
Interdevelopment, Inc.		Management Consulting and Business Research	Margareta Luddemann, President and CEO	P.O. Box 15249, Arlington, VA, 22215	1967	<1	~10	<a href="http://www.interdevelopment.com">www.interdevelopment.com</a>











## Nuclear in Virginia: Private Industry

Updated 6/3/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Invensys Eurotherm		I&C sales, support, repair	Mike Caliel, President and CEO (Invensys)	44621 Guilford Drive, Ashburn, Virginia, 20147	1952			<a href="http://www.eurotherm.com">www.eurotherm.com</a>
ITC Learning		Industrial Skills Training	Gloria MacCorkindale, Vice President	13515 Dulles Technology Drive, Herndon, VA, 22171		~3	~40	<a href="http://www.itclearing.com">www.itclearing.com</a>
JGW Group		Business Development, Training, Consulting	Andrew Wilson, President	1801 Robert Fulton Drive, Suite 400, Reston, VA, 20191	1980		10 (+int'l associates)	<a href="http://www.jgwgroup.com">www.jgwgroup.com</a>
KSB, Inc.		Pumps, valves, and systems supplier	Ed Harvie, President (KSB USA)	4415 Sarellen Rd, Henrico, VA, 23231		~3,125	16,500+ (global)	<a href="http://www.ksb.com">www.ksb.com</a>
Lightbridge		Fuel Cycle Consulting and Design	Seth Grae, President and CEO	1600 Tysons Blvd, Suite 550, Tysons Corner, VA, 22102	1992			<a href="http://www.ltbridge.com">www.ltbridge.com</a>
Limitorque Corp. (subsidiary of Flowserve)		Actuators	Mark A. Blinn, President and CEO (Flowserve)	5114 Woodall Rd, Lynchburg, VA 24502	1929 (Limitorque)	4,954 (FY13) (Flowserve)	15,000+ (Flowserve)	<a href="http://www.flowserve.com/Limitorque">www.flowserve.com/Limitorque</a>
Mega-Tech Services, LLC		Tooling, Engineering Consulting	Deanna R. Bowen, President	11118 Manor View Drive, Mechanicsville, VA, 23116				<a href="http://www.mecha-techservices.biz">www.mecha-techservices.biz</a>
MELD Manufacturing		Manufacturing and Design		200 Technology Drive, Christiansburg, VA 24073	2018			<a href="http://meldmanufacturing.com/">http://meldmanufacturing.com/</a>
Mitsubishi Nuclear Energy Systems		Vendor, Nuclear Services	Makoto Toyama, President and CEO	1001 19th St N #2000, Arlington, VA	2006		200+ (site-specific)	<a href="http://www.mnes-us.com/">www.mnes-us.com/</a>
MPR Associates, Inc.		Engineering and Management Services	Bob Coward, Principle Officer	320 King St, Alexandria, VA, 22314	1964		~200	<a href="http://www.mpr.com">www.mpr.com</a>
Novatech USA		Engineering and Manufacturing Services	Mr. Richard Fl. Rochow, President	220 Jefferson Ridge Parkway Lynchburg, VA 24501	1994		35	<a href="http://novatechusa.com/industries/nuclear/">http://novatechusa.com/industries/nuclear/</a>
Nuclear Energy Support International, LLC		Staffing and Recruitment	Mary Ann Snyder, Owner	Lynchburg, VA 24501	1983			<a href="http://www.nesilc.com">www.nesilc.com</a>
OFI Custom Metal Fabrication		Safety Related Fabrication	Jim Clifford, President	10412 Design Road, Ashland, VA, 23005	1982			<a href="http://www.osfi.com">www.osfi.com</a>
Proxtronic, Dosimetry LLC		Dosimetry Services	W. Guy Davis, President and CEO	85 S. Bragg St, Suite 400, Alexandria, VA, 22312	1990			<a href="http://www.proxtronicdosimetry.com">www.proxtronicdosimetry.com</a>

## Nuclear in Virginia: Private Industry




Updated 6/3/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
Radiological Training Services, LLC		Radiological Training	John Duley, Producer	6538 Koziara Drive Burke, VA, 22015	1999		<5	<a href="http://www.radiationvideos.com/about.html">www.radiationvideos.com/about.html</a>
Radium, Inc.		Steam Generator Services, Products	Cam Abernethy, President and Owner	463 Dinwiddie Ave, Waynesboro, VA, 22980	2004		~10	<a href="http://www.radiuminc.com">www.radiuminc.com</a>
River Technologies, LLC		Radiological Decontamination	Robert Kozma, COO	2107 Graves Mill Rd, Suite A, Forest, VA, 24551	2003		~10	<a href="http://www.rivertechnologies.biz">www.rivertechnologies.biz</a>
Robatel Technologies, LLC		Engineering Services	Teo Grochowski, CEO	5115 Bernard Drive, Suite 304, Roanoke, VA, 24018	2009 (US subsidiary)		115 (Robatel Industries)	<a href="http://www.robateltech.com">www.robateltech.com</a>
SC&A, Inc.		Environmental and Energy Consulting	Gregory P. Beronja, President and CEO	1608 Spring Hill Road, Vienna, VA, 22182	1981			<a href="http://www.scainc.com">www.scainc.com</a>
Seaward Marine Services		Cleaning and Inspection	Edward A. Wardwell, Founder	5409 Beamon Road Norfolk, VA 23513 United States	1972			<a href="http://www.seaward-marine.com">www.seaward-marine.com</a>
TalentHunter		Recruitment and Staffing	Al Visco, Vice President	PO Box 275, Ashburn, VA, 20146	1982			<a href="http://www.talenthunter.com">www.talenthunter.com</a>
TeamBest		Radiation Protection, Cancer Treatment	Krishnan Suthanthiran, President and Founder	7643 Fullerton Rd, Springfield, VA 22153	1977			<a href="http://www.teambest.com">www.teambest.com</a>
Thermal Spray Solutions, Inc.		Thermal Spray Coatings		1105 International Plaza, Suite B Chesapeake, VA 23323				<a href="http://www.thermalsprayusa.com/">http://www.thermalsprayusa.com/</a>
Weidmuller Inc.		IT Products and Services	Brian Schofner, President	821 Southlake Blvd., Richmond, VA, 23235	1850	~40	~100	<a href="http://www.weidmuller.com">www.weidmuller.com</a>



## Nuclear in Virginia: Other

Updated 11/21/2019

Entity	Logo	Nature of Activity	Leadership	Virginia Presence	Founded	Revenue/ Funding, \$1M	Employees	Website
ANS		Not-for-profit, International, Scientific and Educational Organization	Marilyn C. Kray, President	555 North Kensington Avenue, La Grange Park, Illinois, 60526 Virginia Local Section and VCU Student Section	1954		11,000 members	<a href="http://www.ans.org">www.ans.org</a>
Center Advanced Engineering and Research		Non-profit educational and research corporation	Board of Directors, Executive Director Bob Bailey	1173 Research Way, Forest, VA 2455	2006		3	<a href="http://www.caer.us">www.caer.us</a>
Department of Mines, Minerals, and Energy		Governmental research and regulatory body	John Warren, Director	Washington Building, 8th Floor, 1100 Bank St, Richmond, VA, 23219	1985	13.5 State General Fund, 10.5 Federal Funds, 2.6 Fees	174	<a href="http://www.dmme.virginia.gov">www.dmme.virginia.gov</a>
Virginia Economic Development Partnership		State Authority for business advocacy, development, and support	Don Seale, Chairman of the Board	P.O. Box 798, 901 East Byrd Street, Richmond, VA, 23218	1995	17.8 (State General fund, FY2014)	~100	<a href="http://www.yesvirginia.org">www.yesvirginia.org</a>

# Appendix B:

## Virginia Nuclear Energy Consortium Authority Roster

## Virginia Nuclear Energy Consortium Authority Board Members - 2019

Role	First Name	Last Name	Organization
Member	Scott	Kopple	BWX Technologies
Member	Michael	Lempke	Huntington Ingalls Industries
Member	Colleen	Deegan	Bechtel
Member	Woody	Lawman	Flowserve-Limatorque
Chairman	Tom	DePonty	Framatome Inc.
Member	David	Christian	Dominion Energy
Treasurer	Eugene	Grecheck	American Nuclear Society
Member	Andrew	Hutton	Jefferson Lab
Member	Rich	Diddams	Center of Energy Research and Education (CERE)
Member	Bill	Briscoe	George Washington University
Vice Chairman	Gary	Tepper	Virginia Commonwealth University
Member	Sean	Agnew	University of Virginia
Member	John	Capps	Virginia Community Colleges System
Member	Al	Christopher	Department of Mines, Minerals and Energy (DMME)
Member	Jack	Lesko	Virginia Tech
Member	Tim	Stuller	Virginia Economic Development Partnership
Member	Ken	Ball	George Mason University
Secretary	Bob	Bailey	Center for Advanced Engineering and Research (CAER)

Appendix C:  
Virginia Nuclear Energy Consortium  
2019 Report



# VIRGINIA NUCLEAR ENERGY CONSORTIUM

## 2019 Report

### Overview

The Virginia Nuclear Energy Consortium (VNEC) has been in operation for over four years in accordance with Section 67-1404 of the laws of the Commonwealth. This report provides an overview of VNEC's activities and mission.

- Current membership includes:
  - Dominion Energy Services
  - Enfission, LLC
  - GE Hitachi Nuclear Energy
  - Newport News Shipbuilding
  - Virginia Commonwealth University
  - Virginia Tech University
- Officers for 2018, were selected in the Spring:
  - Chairman - John Harrell, Dominion Energy Services
  - Vice-Chair - Alireza Haghighat, Virginia Tech
  - Treasurer - Supathorn Phongikaroon, Virginia Commonwealth University

### Activities and Mission

VNEC works to advocate for the nuclear industry, and our member companies, on a number of fronts. Our work includes promotion of the industry; efforts to address workforce development; initiatives to promote research and development and identify new opportunities for public-private partnerships; and advocacy on legislative and regulatory matters, as well as public awareness of nuclear's role as a carbon-free energy source capable of meeting our clean energy needs.

- **Promotion of Virginia's nuclear assets and capabilities**
  - Co-hosted Virginia is Nuclear Summit on August 23rd with the Virginia Economic Development Partnership (VEDP) to identify emerging issues in, and policy needs to support, the industry
  - Brief policymakers and a variety of state agencies on industry issues



- Provide education and information regarding the nuclear industry's place as a carbon-free energy source and contribution to clean air, new technologies and innovation opportunities and general topics related to nuclear in Virginia
- Coordinate with the Virginia Congressional Delegation to inform and advise staff regarding the importance of the Virginia nuclear industry, and new technologies and innovation, to domestic energy, the economy and national security.
- Assist the Virginia local section of the American Nuclear Society (VA-ANS), in collaboration with the VCU student section of the ANS (VCU-ANS), and the VCU Department of Mechanical and Nuclear Engineering (VCU MNE) to implement advocacy efforts.
  - Organized a "Day on the Hill" in Richmond for nuclear engineering students
- **Workforce Development**
  - Advocacy for passage of legislation to create a 17<sup>th</sup> Career Cluster for energy education
    - Passed and signed into law by Governor Northam on March 12, 2019
  - Support community colleges for training of skilled labor
  - Support for universities training of nuclear engineers and scientists
  - Direction and ongoing support to address industry workforce needs
- **Research and Development**
  - Promote advanced technologies and research
  - Work with Virginia elected officials to develop awareness and recognition of the research assets and capabilities of Virginia nuclear engineering programs.
  - Assist in coordination within the Virginia research and nuclear business community
  - Work to identify public-private investment opportunities
  - Support for member company effort to create new business opportunities or to advocate for nuclear issues
  - Support development of new technologies & innovation opportunities including advanced manufacturing
    - Identify and support next-gen/SM reactor technologies in Virginia
    - Identify and attract new technologies and opportunities
    - Identify possible locations to facilitate new technologies
  - Support for nuclear research opportunities for Virginia universities
- **Legislative and Regulatory Advocacy**



- Support for public policies that advance the nuclear industry
- Identify legislative issues benefiting nuclear growth
- Proactive coordination with state and federal officials advocating for more federal research investment and manufacturing dollars in Virginia.
- Position VNEC as the nuclear organization and advocate in Virginia

## Summary

We have made great strides in advancing the industry and helping ensure its future, and future workforce needs, have been addressed. Following the summit co-hosted with VEDP in 2019, a series of recommendations for enhancing and growing the industry's capabilities were developed.

Going forward, VNEC will focus on implementing these recommendations for the industry to innovate and meet Virginia's energy needs. In 2020 and beyond, VNEC will continue its work to promote research and defense applications of nuclear, manufacturing and to ensure nuclear is recognized as the best option for carbon-free baseload electrical generation.