



NUCLEAR POWER INSTITUTE

In 2007, recognizing the need for a technical and knowledgeable workforce, the Nuclear Energy Institute (NEI) and industry executives began focusing their attention to the educational pipelines that were established to fill the workforce needs of the future. At the end of 2007, NEI, in cooperation with the Institute of Nuclear Power Operations (INPO), established the Nuclear Uniform Curriculum Program (NUCP) to develop Associate’s level degree programs for individuals to fill maintenance, chemistry, radiation protection, and non-license operator entry level positions.

The NEI manager of Industry Infrastructure and program manager for NUCP at the time, Elizabeth McAndrew-Benavides, reasoned that this initiative could develop a network of schools that could help educate people to a higher, more specific level where they could be more useful when they entered the workforce. Through these initiatives, NEI and INPO were able to bring university and college partners together and share ideas and best practices, something that had not been done in the past.

Seeing the need for these programs, a request by the two nuclear-electric utilities in Texas was sent to Texas A&M University to establish a similar program. In December of 2007, the Nuclear Power Institute (NPI) was established by the Texas A&M University Board of Regents. The purpose of this program was to train and educate a new workforce to operate planned reactors in the State of Texas. Pioneered by Texas A&M University and funded with a \$1 million grant from the Texas Workforce Commission (TWC) to begin. Through its programming efforts, NPI’s yearly K-12 engagement since 2007 averages over 700 combined students and educators, with an average of over 1,700 since 2015.

360 Degree “Network of Engagement”

NPI’s “Network of Engagement” is an ongoing effort that encompasses NPI’s K-12 programs, Higher Education partners, and Industry interactions. The efforts NPI has in place are designed to incorporate each level of engagement at every stage with a 360-degree approach of anticipating and considering all perspectives and information from each of our network partners.

This network enables engagement and enrichment opportunities for students, educators, and professionals in K-12 schools, community colleges and universities, and stakeholder industries across Texas. The participating students at each of these levels are gaining awareness, training, and experience in the emerging clean industry to prepare them for the Texas STEM workforce.

K – 12 Programs



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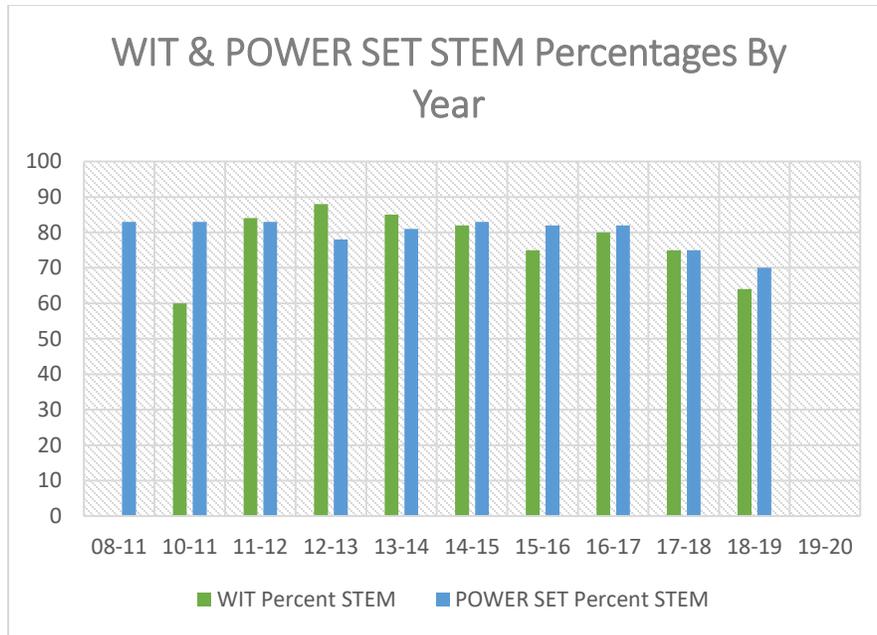
Although K-12 programs were not an initial focus, they quickly became the “heart” and core of NPI initiatives. The first NPI outreach initiative was developed by Dr. Valerie G. Segovia after a chance meeting with then NPI leadership when Dr. Segovia was the Palacios High School Principal. Dr. Segovia was simply asked to create a program for her female students as females are historically underrepresented in the nuclear energy sector. Realizing the unique opportunity being given and the higher education and industry resources NPI could offer her students, Dr. Segovia quickly created the “Powerful Opportunities for Women Eager and Ready for Science, Engineering, and Technology” (POWER SET) program in 2008 to encourage her students to pursue their studies and eventual careers in science, technology, engineering, and math (STEM). With NPI providing access and financial support, POWER SET members began to blaze trails across the state and impassioning their fellow classmates, families, and community members.

The first year of POWER SET included only Palacios High School with 19 students. Dr. Segovia was hired by NPI in September of 2009 becoming responsible for all K-12 program creation, development, management, and leadership. By 2010, POWER SET had proved to be successful in influencing the percentage of graduating high school seniors going into STEM degrees. With this success, additional funds from the TWC, and a special visit from then Texas Governor, Rick Perry, to Palacios High School, the “Workforce Industry Training” (WIT) program was launched to expand the reach and reinforce the success of POWER SET.

Modeled after the POWER SET program, WIT was designed for both male and female students who were primarily interested in two-year technical degrees or certifications. Through the WIT program, students participated in events and activities that would expose them to all industries, their professionals and trades, and STEM college and university programs around the State of Texas. The WIT and POWER SET programs rapidly grew around the State of Texas, expanding NPI’s reach to 10 high school partners for each program and totaling 450 student membership by the 2012 – 2013 school year.

Traditionally, only 15% - 17% of U.S. high school graduates pursue a STEM college degree. However, with the exposure to STEM through the WIT and POWER SET programs, NPI can boast an average of 75% to 80% of graduating NPI program high school students pursuing a STEM degree over the past decade. The impact of NPI on the Texas workforce, especially in relation to STEM sectors, is profound. Early introduction and sustained support to STEM fields has proven to be key to future education, career success, and integration into the Texas workforce.

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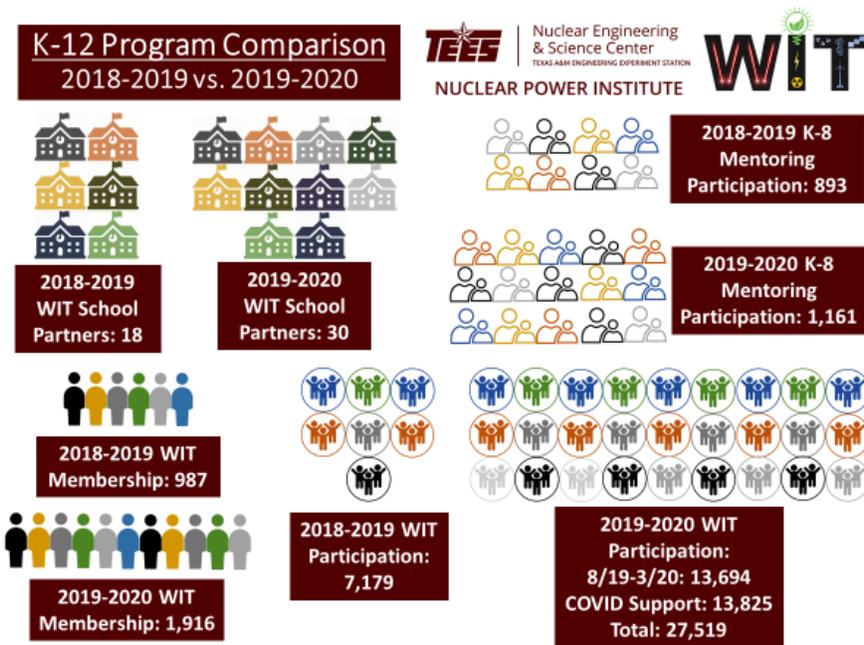


NPI soon developed two more programs to deepen the exposure of STEM and amplify POWER SET and WIT members' STEM passion and enthusiasm into primary schools with the creation of Power GRID (Girls Responding to Industry Demands) and Boys Resourcing Technology (BRT). The Power GRID and BRT programs were mentorship programs respectively for POWER SET and WIT members to encourage and sustain early STEM interest and studies. These unique, collaborative, and nurturing relationships were strengthened through a range of academic and non-academic activities and was proven to cultivate leadership skills, improve self-esteem, and STEM studies.

Fast-forward to the 2018 – 2019 academic year, NPI grew to 18 school partners supporting POWER SET and WIT programs on each of those campuses with a total of nearly 1,800 student members across the two programs not including the numbers from Power GRID and BRT. In June of 2019, NPI went through a dramatic restructuring that combined the high school and primary school programs and updated its mission statement to incorporate “clean energy”.

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The programmatic result of this restructure was the absorption of POWER SET into the WIT program, and the combination of Power GRID and BRT to form the “Achieving Through Optimistic Mentoring” (ATOM) program. As NPI recalibrated its focus, there was tremendous growth in the 2019 – 2020 academic year from 18 to 30 high school partners.



The 2019 – 2020 academic year was additionally unique due to the COVID-19 pandemic in March 2020. This pandemic halted all face-to-face interactions, industry, college, and university visits, and other valuable opportunities NPI traditionally provided resulting in a dramatic but swift pivot to virtual experiences and opportunities for WIT and ATOM members. NPI reimagined funding expectations to support over 13,000 student interactions and impacts from March through May 2020.

Another impactful program that NPI started is a community-wide engagement event called “Science on Saturday” (SOS). SOS was created in 2012 as a bridge between Higher Education, Industry, K-12 Partners, and surrounding communities, and was the culmination of all NPI activities in a physical form highlighting the passion of students in our programs. These events were coordinated, organized, and supervised by the local POWER SET and WIT Sponsors, with members taking the lead in selecting, managing, and demonstrating hands-on STEM booths. Area, higher education and industry partners also attended to provide support and information along with their own demonstrations. These SOS events have now become highly anticipated community events which are attended by children of all ages – from babies to grandparents. From 2012 – 2019 there were 12 SOS events with an impact of over 3,800 individuals.



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One of the most important aspects of the K-12 programs that NPI sponsors are the educators. Our educator-partners have become our most important ambassadors. Without the efforts and coordination of the educators in the NPI-partnered schools, programs would not be as successful as they have been. Educators take the information we provide, share, and highlight and incorporate it into their already very full curriculums in a seamless, impactful manner. NPI has remained committed to its educator partners by providing scaffolded resources, training, and other opportunities specifically for educators – each building on the ones that came before. Since NPI inception, educators have benefitted from the following programs: Enrichment Experiences in Engineering (E3), STP Teacher STEM Camp, “Community Leaders and Educators Actively Networking” (CLEAN), “Educators Uniting Resources, Excellence and Knowledge for Achievement” (EUREKA), “Teacher Research Academy” (TRA), “Counselors Making Occupational Readiness Exciting” (C-MORE), “Building Leaders, Organizing Strong Scientists and Optimizing Mathematics” (BLOSSOM), and a foreign teacher exchange program.

Higher Education Programs

Another component of the Nuclear Power Institute during inception was to create partnerships with higher education colleges and universities. In the beginning, these partners were awarded funding for nuclear-based technology degrees.

Over the past decade, NPI has partnered with the following Texas universities and colleges: Prairie View A&M University, Tarleton State University, Texas A&M University – Corpus Christi, Texas A&M – Kingsville, University of Houston – Downtown, University of North Texas, Brazosport College, Texas State Technical College, and Wharton County Junior College.

Through the 2019 – 2020 academic year, NPI introduced the encouragement of K-12 outreach programs along with other traditional requests for proposal submissions from higher education institutions across the State of Texas. NPI received and accepted over \$1.8 million in higher education contracts to start the 2020 – 2021 academic year. These contracts included activities ranging from developing outreach programs, internships, technology and equipment expenses, and summer camps.

During the COVID-19 pandemic, much of the State of Texas was impacted financially. Funding was reduced in higher education institutions across the State of Texas to counter the financial impact from closing businesses and social distancing. This reduction significantly impacted NPI and its partners. Unfortunately, NPI was forced to cancel the 2020 – 2021 academic year contracts with its higher education partners. Even so, NPI provided support for three higher education partners who were able to implement their planned programs for the Summer of 2020.



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Prairie View A&M University, Texas A&M University - Kingsville, and the University of North Texas were able to provide STEM-related programs and activities for high school students. These programs included an outreach STEM camp, summer internships, a research experiences program, and K-12 STEM catch-up summer program. A total of 271 students were impacted over the 2020 summer because of the programs NPI supported through its higher education partners.

Industry

With workforce being a major component of the NPI mission, engagement with industry is key. Through our relationship with the South Texas Project Nuclear Operating Company (STPNOC), NPI has been able to select NPI-partnered teachers to participate in the STP STEM camp. This has been a strong collaborative relationship since inception. Over the course of 2008 – 2019 NPI has supported 40 educators to participate in the STP STEM camp. STP was the first industry partner that pioneered the programs and interactions that NPI has built through its industry partners.

The STP STEM camp allows participating educators an opportunity to learn about all the career options, professional benefits, work environment, safety culture, workforce needs, and scholarships the nuclear energy sector has to offer. Educators can then share this new information with their students as they apply the new knowledge, experiences, and material into their everyday instruction while they better provide insight to their students and communities.

Interested high school students can then apply to the STPNOC Educational Incentive Program (EIP) in order to prepare themselves to join the nuclear energy sector workforce. The EIP provides a fully funded 2-year education, resulting in an Associate’s Degree in Nuclear Power Technology with higher education partner, Wharton County Junior College. Educators continue to prove to be the greatest ambassadors of workforce information dissemination.

Phillips 66 was another early adopter that supported NPI programs and partners. Through their support of “C-MORE”, POWER SET, and WIT, Phillips 66 looked beyond nuclear by implementing instruction because they strongly believed in the NPI approach of working with K-12 educators and students. This holistic approach provided students the opportunity to engage with and learn about all fields in STEM, most importantly those in the areas of their homes and families, allowing participating students to realize the benefits and requirements of industries in their “back yards” while they are still in K-12 schools.

Each of these industry interactions are an important part of the 360 degree “Network of Engagement” NPI has built through its partners allowing each partner to contribute to each participant in the network.



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Looking Toward the Future

Going forward into the 2020 – 2021 academic year under a new budgetary structure and a predominately virtual environment due to the COVID-19 pandemic, NPI developed new programs and opportunities to fit into this new landscape while maximizing local resources and “at-home” talents and skills by NPI staff, colleagues, friends, and families. The current “menu” of opportunities NPI is offering are the following: Workforce Industry Training (WIT), Achieving Together with Optimistic Mentoring (ATOM), Nuclear Science Week (NSW) competition, Clean SMARTS Master Class, “The Catalyst” newsletter, “Science in the Kitchen – Cooking Up Curiosity, and “The Path of Most Persistence” podcast.



Engagement Opportunities

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Workforce Industry Training

NPI's "Workforce Industry Training (WIT)" high school program provides students interested in expanding their knowledge and understanding of STEM careers with higher education and work experiences.

Achieving Together with Optimistic Mentoring

The "Achieving Together with Optimistic Mentoring (ATOM)" program provides WIT members an opportunity to give back by interacting with and mentoring younger elementary and middle school students – engaging them in academic activities that impassion these students to stay focused on a strong STEM path.

Nuclear Science Week Student Competition

"Nuclear Science Week Student Competition: Get to Know Nuclear" projects promote discussion and increases awareness of nuclear science in the local community.

Clean SMARTS Master Class

The "Clean SMARTS Master Class" six-episode mini-series provides viewers with an opportunity to hear, learn, and be inspired by experts in the areas of Security, Manufacturing, Automation, Radioisotope production, Technology, and Success skills (SMARTS).

The Catalyst

NPI's "The Catalyst" newsletter provides our network of engagement with quarterly reports of NPI's programs, activities, and success stories.

Science in the Kitchen - Cooking Up Curiosity

"Science in the Kitchen - Cooking Up Curiosity" video series explores the science, production, automation, distribution, and workforce behind the Texas food industry using the "kitchen" and "cooking" as alternative platforms to convey STEM knowledge and information.

The Path of Most Persistence

"The Path of Most Persistence" podcast educates and inspires by highlighting and sharing tenacious stories that provide inspiration, motivation, and appreciation.

Each of these experiences and opportunities will be made virtually accessible through a new online platform called “Canvas” hosted by NPI. This online platform will help NPI be more available to reach



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more students across the State of Texas. In several of these new initiatives, NPI has partnered with high-impact professionals and experts in the STEM field to help provide the largest impacts possible for those involved with NPI programs. Some of our experts include Texas A&M University faculty and staff, a Commissioner of the Texas Workforce Commission, a Senior Advisor of the U.S. Department of Energy, and a US National Laboratory expert.

In conclusion, the 2020 – 2021 academic year has already begun paying large dividends due to the efforts NPI set in motion. In just the first two months of the 2020 – 2021 academic year, NPI has increased its school partnerships to a total of 41 different schools across the State of Texas. As of October, NPI has 2,000 students and 78 educators engaged in an NPI program. Through all the changes, challenges, and pivots, NPI has remained constant in its pursuit of excellence in its programming and staffing. To this end, NPI remains nimble, prepared, and committed to continuing its mission of developing the necessary workforce for the State of Texas.