



An NSWC Crane engineer loads critical electronic components into a customized system to support reliability testing of strategic radiation hardened microelectronics.

ALL INNOVATION ALL THE TIME

IN3 Tackling Technology Challenges

By **Crickett Gibbons**

Indiana leaders in government, industry, military and research universities are coming together to solve pressing technology challenges facing the U.S. Department of Defense (DoD) and the private sector through collaborative partnerships spearheaded by the Indiana Innovation Institute (IN3).

The organization aims to leverage the top minds and resources in the state through a comprehensive approach, enabling technology transfer and commercialization in a faster, more cost-effective way for DoD and industry.

First known as the Applied Research Institute (ARI), IN3 initially was funded through a \$16 million grant that was part of a larger allocation for regional economic development efforts in southwest central Indiana.

“It’s been a 2½-year journey ... to where we see it today, which is in demand and much more real and viable and fighting for both our universities and our economic development organizations across the state. Most importantly, it’s (IN3) become very appealing to NSWC Crane, because it gives them a pathway into a broad range of researchers that they wouldn’t normally have,” shares retired Air Force Gen. Gene Renuart, chair and CEO, who has been involved since the initial planning and development phases of IN3.

“What we hoped to do was create an organization that offered the broadest level of research capability and capacity that we could find, and obviously to benefit the state of Indiana to a large extent.”

Renuart also points to the influence and breadth of the board of directors, which includes the governor; presidents of Indiana University and Purdue University; and industry leaders from Cook Group, Rolls-Royce and TASUS. The CEOs of the Bloomington-based Regional Opportunity Initiatives and eight-county Radius Indiana partnership are also on the board.

Bill Kiser, IN3 executive vice president for science and



IN3’s collaborative workspace in the WestGate@Crane Technology Park includes office and conference rooms where engineers from NSWC Crane and other organizations can meet. A maker-space is also planned.

technology, stresses the need for a broad range of capabilities to accelerate technology solutions.

“When you look at some of the technologies we are looking at, it requires significant cross-disciplinary teams that you may not find in one institution, and it may not all reside in a university. So we really have to put together these large, purpose-built teams to drive that original idea the whole way into some sort of meaningful product or service that you can provide to the commercial and the DoD sectors.”

Early signs point to success

In June, IN3 and Naval Surface Warfare Center, Crane Division (NSWC Crane) signed a joint agreement with Purdue and Indiana universities that supports work to develop trusted microelectronics, which are counterfeit-resistant and immune to various types of attacks.

“We were able to negotiate a multi-entity cooperative research and development agreement, or CRADA, which is really unique in that most others are one-on-one direct agreements with the government. This brought in three different organizations and the government in a partnership,” Renuart highlights.

The CRADA allows the four entities to work collaboratively and ensures open communication of technical requirements, research results and sharing intellectual property.

IN3’s board of directors approved up to \$3.5 million to develop trusted microelectronics at its initial meeting in August 2017, when it was still called ARI. In April 2018, ARI became IN3 and awarded its first contract to Purdue, with Indiana University and the University of Notre Dame as subcontractors, for a program called Achieving Scientifically Secured User Reassurance in Electronics (or ASSURE).

“We focused on microelectronics because that was a significant need and demand from the Department of Defense, but it also fits the skill sets of the university researchers that we knew we had available within the state,” Renuart discloses.

With \$7 billion to \$10 billion identified in the DoD budget over the next five years for research and development in the trusted microelectronics space, Renuart wants to help the state of Indiana capture as much of that as possible.

Inflows of new capital from research contracts is one of the key developments Radius Indiana CEO Jeff Quyle attributes to IN3.

“It’s still a little bit early in the process to expect to see results,” he admits, “but the things IN3 are doing seem like they’re right



With the opening of the largest Mach 6 quiet wind tunnel in the United States at the University of Notre Dame in November 2018 (above), Indiana has two elite facilities to support research in hypersonics. The Notre Dame facility joins the Boeing/AFOSR Mach 6 quiet wind tunnel at Purdue University (below).



on track to take us toward some really exciting future successes.”

IN3 also reports having discussions with Purdue and Notre Dame for hypersonic research. In November, Notre Dame unveiled the nation’s largest Mach 6 quiet hypersonic wind tunnel, adding to the capabilities already available through another quiet Mach 6 tunnel at Purdue.

Other focus areas include electro-optics, security, sensor fusion, data assurance and energy storage.

While the early priorities have been on DoD needs, many of the same areas have implications for the private sector, and involving industry is a key component.

“There is a tremendous amount of crossover between military and commercial

technologies,” Kiser observes. “I think it’s not really prudent for us to even separate them anymore. There has to be significant crossover as technologies get more and more complicated. We have to ensure that the investments in one area spill over to the next. So there will be multiple opportunities to support multiple sectors as the technical capabilities start to grow.”

The same is true for growth beyond the initial geographic area of southwest central Indiana, the Interstate 69 corridor and NSWC Crane.

“The technologies we have spent a great deal of time and effort on and the questions that come back to us from a variety of customers tell us that this has economic

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impact implications across the entire state and potentially even within the Midwest region,” Renuart notes. For example, Kiser has talked with members of the Michigan Aerospace Manufacturers Association.

Identifying talented teams

To enhance communication and identify talent from across the state that can help drive innovation and related economic development, IN3 launched the INdiana Consortium for Advanced Technology Transition (INCATT). The consortium includes large and small businesses, a number of academic institutions and non-profit and non-traditional organizations that may not currently work with the DoD.

“This consortium brings those partners ... into the communications sphere so they have better visibility on what the government might be pursuing,” Renuart remarks. “They also share with us their skill sets and capabilities so we can make that available to the government.” Through the consortium, IN3 can help identify partners with strengths in particular areas. Members gain access to current and relevant defense requirements, technology and information on procurement and policy.

With collaboration among so many different entities, “there’s going to be much more efficient use of resources and, I think, there’s going to be an explosion of creativity,” Quyle maintains. “There are so many bright people who are involved in this organization and are being engaged in the research IN3 is pursuing and bringing together. I think we’re going to see one plus one equal three.”

Facilitating collaboration

Identifying partners to work together on specific solutions – or innovative possibilities – is helpful. But having a space to meet and work together is even better. That’s why IN3 opened a collaboration space at WestGate@Crane Technology Park, outside the gates of NSWC Crane, where civilians and DoD researchers can easily gather to share ideas and resources without going through security or requiring classified access.

A 1,000-square-foot meeting space in the WestGate Academy Conferencing and Training Center opened in October, with an associated maker-space in the works.

“Our next phase is an 8,000-square-foot opportunity to put together modular labs where people from a variety of different and diverse organizations can work together to prototype to bring some of these technical ideas to light,” Kiser outlines.

This easily accessible space where NSWC Crane and outside researchers can meet and work together helps fulfill the original vision the community and developers had for the WestGate Academy, Quyle offers. “Folks figured it out two years ago, and now we’re finally achieving it.”

He adds, “I think the intellectual property that’s going to spin out ... that’s going to be good for the Indiana economy. It’s going to lead to commercialization of ideas and lead to, hopefully, production and manufacturing and employment and further investment.”

RESOURCES: Gene Renuart and Bill Kiser, Indiana Innovation Institute, at www.in3indiana.com | Jeff Quyle, Radius Indiana, at www.radiusindiana.com



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