



Good luck to new and returning students!

As the academic year begins anew at the University of Tennessee, Knoxville, *IJNS* speeds up work on submissions and a new special issue.

Over the summer, *IJNS* was able to publish a regular issue of the journal (volume 6 issue 1) and a special issue on INSEN (volume 6 issue 2). We continue working toward another regular issue as well as a Special Issue on Women in Nuclear Security.

IJNS Vol. 6 Issue 2: Special Issue on INSEN

By Rachel Brooks
Davis Editorial Fellow, Associate Editor, Editorial Liaison for Special Issue on INSEN


The Special Issue on INSEN is complete! We now present a special issue focusing on the first 10 years of the IAEA's International Nuclear Security Education Network (INSEN) and on the network's impact on the world of nuclear security education.

In this issue, many former chairs of INSEN reflect on their experiences as chairs in an article entitled "The INSEN Experience, by INSEN Chairs." Dmitriy Nikonov of the IAEA, also a former chair, contributed an article on the past 10 years of INSEN's existence.

Dr. Matteo Gerlini volunteered as our Guest Editor for the special issue on INSEN. His work and expertise were invaluable in producing this special issue. I would like to thank him for his help, and *IJNS* hopes to continue working with him in the future! Additionally, many of our *IJNS* editors helped publish these articles, and I would like to thank them as well.

To view these articles celebrating INSEN's tenth anniversary and to explore its history and impact, see our website for Vol. 6 Issue 2:

<https://trace.tennessee.edu/ijns/vol6/iss2/>

 @nuclear_journal

Edited by Rachel Brooks, Ethan Barlow, & Ashley Humphrey

OVERVIEW:

- Upcoming Events
- Special Issue on INSEN
- Expert Says "the Future is Bright" for Nuclear Security Professionals
- Amb. Lehman & Maj. Gen. Chambers Discuss US Nuclear Deterrence

This newsletter is designed to keep students, staff, and journal supporters up-to-date on how the journal is impacting global efforts to encourage diversity in theoretical foundations, research methods, and approaches.

UPCOMING EVENTS

- August 31, 2020: Multimedia art submissions for Special Issue on Women in Nuclear Security due - submit (and send any questions) to editorial liaison Ashley Humphrey at ashley.ijnsutk@gmail.com!
- September 30, 2020: Paper submissions due for Special Issue on Women in Nuclear Security - submit using the *IJNS* website and include "WNS" somewhere in the title or author name(s).

Expert Says "the Future Is Bright" for Nuclear Security Professionals

By Ethan Barlow
Assistant Editor

Seeking a rewarding career in nuclear security? On July 29th, 2020, I had the privilege of interviewing a nuclear security expert. And by "expert," I don't just mean "knowledgeable." He has, in this industry, over 27 years of experience.

Cary Crawford is the program manager of Safeguards & Security Technology (SST) at the Oak Ridge National Laboratory (ORNL) in Tennessee, USA. He's also the president of the Institute of Nuclear Materials Management (INMM).

But like many who end up in the field of nuclear security, he initially did not envision himself in this kind of role.

In 1992, Mr. Crawford earned an MS in Applied Mathematics from the University of Oklahoma. Then, when the Pantex Plant in Texas hired him to be a statistician (1993-97) for its Safeguards & Security Directorate, he became immersed in the world of nuclear security (NS).

After Pantex, he continued his NS career as a senior instructor (1997-2001) for the Department of Energy's (DOE) Nuclear Safeguards & Security Complex in New Mexico, before working for 14 years (2001-15) in Washington at the Pacific Northwest National Laboratory (PNNL). For PNNL's programs in NS, he served as a senior research scientist, then as a technical group manager.

Clearly, Mr. Crawford has a long history in the NS sector—and still, my brief description here does not do justice to his impressive background in nuclear security. Nevertheless, it's obvious by now that he didn't stumble by accident into his current

position as SST program manager (2016-present) at ORNL, a national lab that's heavily involved in the nuclear fuel cycle.

Mr. Crawford's vast experience in nuclear security allows him to lead a group that researches and develops technologies for, primarily, nuclear security.

"My group is more focused on technology," he says. Roughly speaking, "half of it" involves nondestructive assay (NDA)—measuring the properties of nuclear materials without damaging them—while "the other half" involves safeguards & security technologies that apply to nuclear security as well as to other security needs.

What are those technologies? Mr. Crawford elaborates, "We're looking at detection, delay, response, neutralization, and deterrence against adversarial actions, whether they be design-basis threat [DBT] type actors or whether they be national-level actors." This involves technologies such as access controls, intrusion detection and sensors, and artificial intelligence—"things that tell you that people are going places or doing things that they're not authorized to do."

To sum up the mission of SST, he continues, "Anything that has to do with ensuring that nuclear material is present, accounted for, being used for its intended purpose, not being stolen or sabotaged—anything around that level of protection, control, and accounting, technology-wise—is within the scope of my group."

All of this is very "lab-intensive work" compared to other NS groups, says Mr. Crawford. So when the COVID-19 pandemic hit the US, "it surprised me," he remarks, "that we would be able to deal with work from home at the level we have," noting that the productivity of SST has not suffered significantly.

"Nearly 100% of my group is able to work from home," he says, "and we

developed a process by which we tracked who was going in and when so that we minimized interactions." So far, this new system, a hybrid of virtual and on-site work, has worked out fairly well.

It's vital that groups like SST continue their research and development in safeguards and security. "If we were to lose that capability nationally," says Mr. Crawford, people could figure out ways to compromise existing systems. He emphasizes, "As technologies advance, security technologies have to advance with them."

And critical to the NS front, according to Mr. Crawford, is the network of organizations—each with its unique "angle"—spanning not just the US but also the globe, an interconnected web that "breeds better security technologies" and practices.

As the president (2018-present) of an international professional society—the INMM—and as a dedicated member who's been to every INMM Annual Meeting since 1997, he sees first-hand how invaluable this global network is for effectively stewarding nuclear materials.

Looking ahead, Mr. Crawford sees a lot of potential in the next generations of NS professionals, noting that he's impressed with their aptitude for this field—which is a good thing, too. He says that, in the next ten years, "we're going to see a big gap to be filled" within the workforce by those under the age of 40, as many in his own age group begin to retire.

Who's going to fill his shoes and those of other professionals who have for decades been in the nuclear security industry?

No need to panic. "I think the future is really bright for the next generation," says Mr. Crawford, "not only to step in and take over but to bring some of those creative ideas" that no one has ever thought of before.

Amb. Lehman & Maj. Gen. Chambers Discuss US Nuclear Deterrence

By Ethan Barlow
Assistant Editor

On June 30th, the eve of July, I watched a virtual presentation by two prestigious gentlemen, Ambassador Ron Lehman and Major General Bill Chambers. In this SMA STRATCOM session, the experts discussed the "Report on Scenario-Based Planning to Maintain the Credibility of the U.S. Nuclear Deterrent Against Emerging Threats." This report is by a task force of the Threat Reduction Advisory Committee (TRAC), and both speakers are Co-Chairs of this task force. In addition to sharing their findings, they also shared their recommendations for addressing challenges to nuclear deterrence. One key—to improving the evidence-based decision making of the U.S. Department of Defense—is the use of better analytic tools. This includes tools like simulations and war games—fascinating stuff! Of course, the substance of their report is beyond the scope of this newsletter, but I encourage all who are interested in this subject to read the document, which you can find at nsiteam.com.