U.S. Senate Committee on Commerce, Science, and Transportation
Nominations Hearing of Dr. Laurie Locascio
October 20, 2021
Questions for the Record – Minority

Ranking Member Roger Wicker

Question 1: The Cryptographic Module Validation Program (CMVP) is a joint effort between the National Institute of Standards and Technology and the Canadian Centre for Cyber Security, a branch of the Communications Security Establishment. The goal of the CMVP is to promote the use of validated cryptographic modules and provide Federal agencies with a security metric to use in procuring equipment containing validated cryptographic modules. According to NIST, CMVP is "experiencing a significant backlog in the validation process." If confirmed, what steps do you plan to take to streamline the Cryptographic Module Validation Program (CMVP) process to ensure the government can benefit from the most current version of products and services to stay ahead of the evolving cyber threat?

Response:

I am aware of the Cryptographic Module Validation Program and understand its importance in helping to assess the security of encryption products purchased by the federal government. This is a critical component in the overall cyber defense strategy to reduce our exposure to existing and future cyber threats. If confirmed, I will review the program to identify the necessary resources to improve the security, efficiency, and timeliness in such validation.

Question 2: Based on your vast experience with NIST, what types of initiatives do you believe could improve the efficiency and timeliness of CMVP validation, including training programs, improving communication with vendors through automation and standardization of messages at each stage of validation, digitizing and streamlining documentation that vendors are required to complete, and identifying overlapping of compliance frameworks?

Response:

It will be important to do a quick comprehensive assessment of the program to identify the root cause of the backlog. If confirmed, I look forward to working with you, industry, and other federal agencies to review the program, as well as efforts undertaken by other organizations and international partners to ensure harmonization.

Question 3: Will you commit to addressing the dilemma caused by the need for frequent updates and patches to stay ahead of cyber-attacks and the existing CMVP validation process that may not permit rapid implementation of these updates while maintaining a validated status?

Response:

If confirmed, I commit to addressing this dilemma in order to increase the overall security of our system.

Question 4: As I'm sure you are aware, NIST facilities are now 60-70 years old and suffering from a large back log of maintenance needs. 58 percent of facilities are in poor to critical condition per Department of Commerce standards, with older labs unable to support controlled environments required for advanced research. Currently, the backlog of deferred maintenance has reached $834.5 million. Moving forward, how do you plan to address this immediate and continually growing issue?

Response:

When I was last at NIST, the institute's infrastructure was in dire need of resources and refurbishment. Unfortunately, this remains true today. While at NIST, I worked with a large team on the development of an Integrated Master Plan for Facility Renovations to prioritize the renovation and building of state-of-the-art facilities for research in Gaithersburg and Boulder. If confirmed, I will make it a priority to work closely with Congress and NIST leadership to prioritize and obtain the resources to make sustained progress on NIST's critical infrastructure projects. Facility renovations will be important for enabling NIST to perform more cutting-edge research in key emerging science and technology domains like quantum, biotechnology and next generation communications.

Question 5: Congress has directed NIST to work with both private and public sectors to develop an Artificial Intelligence Risk Management Framework to assist design, deployment, use, and evaluation of AI technologies. The purpose of this voluntary framework is to help the community incorporate characteristics of trustworthiness into these systems and technologies. In your view, how important are these activities to the future of AI technology development and deployment in the U.S.? Additionally, how would you recommend NIST work with its European and other government counterparts to promote global cooperation around trustworthy AI standards?

Response:

These activities are very important to the future of AI technology and deployment in the U.S. In order to have broader adoption and acceptance of AI in all sectors from banking to transportation to medicine, we need to have confidence that the AI algorithms are secure, unbiased, and explainable. My understanding of NIST's work on the development of the Artificial Intelligence Risk Management Framework with stakeholders from across the U.S., as well as its fundamental and applied AI research programs, is that they are dedicated toward cultivating trust in AI. This trust will ensure we can realize the full potential of this emerging technology, and I look forward to working with you to strengthen NIST's role in this area.

I understand that discussions are already underway with the EU and other like-minded government counterparts to promote global cooperation in AI. If confirmed, I commit to supporting the Secretary of Commerce to engage our counterparts in these discussions. I will also ensure that NIST's AI experts are at the table meeting with their technical counterparts in standards bodies and in bilateral and multilateral meetings to address these issues.

Question 6: NIST plays a vital role in the coordinated U.S. government approach to being the world leader in quantum technology through university collaborations such as JILA, the Joint Quantum Institute (JQI) and the Joint Center for Quantum Information and Computer Science (QuICS), as well as activities to enable and grow the quantum industry through the Quantum Economic Development Consortium. What is your vision for the continued growth of their activities, and collaborations with both US and allied international stakeholders?

Response:

Quantum is a critical emerging technology space that the U.S. must own as dominance in this area will lead to great economic strength and national security advantage. NIST and its partners have been global leaders for more than a decade and a half in quantum science and technology. NIST has a long history of not only conducting world class quantum research but also supporting industry efforts in quantum information science. The three institutes you mentioned are key examples of NIST's investment in this area and its' strong collaborations with academia in developing the workforce for important industries of the future, as I have witnessed firsthand in my role at the University of Maryland.

If confirmed, I will continue to support strong research and key collaborations with industry and academia in quantum science and technology, with the goal of enhancing and maintaining U.S. leadership and competitiveness in this critical technology area. I would look forward to partnering with other agencies, including NSF, to continue to promote the advancement of quantum in the U.S.

Question 7: The Facial Recognition Vendor Test (FRVT) program is among NIST's initiatives to provide biometrics vendors the opportunity to test their technologies and further NIST's efforts to conduct research to improve and benchmark the accuracy, efficacy, and anti-bias capability of biometric identification systems. A robust testing infrastructure is required to keep pace with the rapid development and deployment of such systems in the field. For example, testing cloud-based systems or human recognition algorithms in addition to facial recognition algorithms may require additional investments. How would you ensure that NIST has the capacity, in light of resource constraints, to comprehensively test and develop standards for biometric identification systems through programs including FRVT? How would you suggest NIST work with the private sector and other federal agencies to align its testing programs with their needs?

Response:

In the area of biometrics, NIST has been working with public and private sectors since the 1960s. Biometric technologies provide a means to establish or verify the identity of humans based upon one or more physical or behavioral characteristics. NIST responds to government and market requirements for biometric standards, including facial recognition technologies, by collaborating with other federal agencies, law enforcement, industry, and academic partners to: research measurement, evaluation, and interoperability to advance the use of biometric technologies including face, fingerprint, iris, voice, and multi-modal techniques; develop common models and metrics for identity management, critical standards, and interoperability of electronic identities;

support the timely development of scientifically valid, fit-for-purpose standards; and develop the required conformance testing architectures and testing tools to test implementations of selected standards.

We have seen a considerable rise in facial recognition technologies and other key biometrics in both the public and private sector. NIST plays an important role in developing biometric standards, including through research on different biometric technologies and common metrics for testing. If confirmed, I look forward to seeing how NIST's role can be strengthened to ensure the responsible development and use of technology. If confirmed, I will work to ensure that NIST will continue to seek out strong collaborations with other agencies and private sector partners in the area of biometrics.

Question 8: R&D plays a critical role in promoting American leadership in technology, innovation, and standardization. It is imperative that the US maintain its leadership, and a strong US patent system that rewards and protects investments in R&D is a necessary component of a thriving innovation ecosystem. In your experience leading a university technology transfer program, what difference has the role of licensing, technology transfer, collaboration agreements, and the US patent system played in encouraging innovation and investments?

Response:

U.S. universities receive funding from the federal government to do research, to innovate, and to discover. Then they take those discoveries into market for the benefit of the U.S. through patenting, licensing, and spinning off companies based on the IP developed – most often supported by federal grants. Both the inventor and the university can profit from these tech transfer activities, and the university is assigned with the duty of managing any potential conflicts of interest that arise. Four years ago, the University of Maryland spun out a company from its quantum research program. IonQ is the first pure-play quantum computing company to go public in the U.S. When it was announced that it would go public in early 2021, it was valued at $2 billion. This is a great success story out of innovation that started at a university with sustained public research funding.

The U.S. needs to have a continued focus on policies that allow for universities and other institutions to patent and license their technologies. Entrepreneurs and innovators at universities and other institutions should be able to profit from their inventions to incentivize the transfer of technology for economic benefit. Supporting tech transfer through federal grants would be extraordinarily helpful to universities all over the U.S. Doing tech transfer right is a costly enterprise and universities have a lot of competing financial priorities that impinge on patent/licensing budgets as well as resources for our entrepreneurs.

I also believe that we should provide more flexibilities for inventors in the federal government to spin off companies and profit from their inventions. Without greater flexibilities and incentive programs, we will continue to miss out on the potential economic benefit associated with the inventions made by our federal workforce.

If confirmed, I would look forward to working with the committee in these areas.

Question 1: Ms. Locascio: One of NIST's key roles is to assist the nation's talented manufacturing industry so we remain the world leader when it comes to competitiveness and innovation. One way NIST serves this role is by administering Manufacturing USA, a program that Senator Brown and I helped to establish back in 2014, and which we worked to expand through the United States Innovation and Competition Act of 2021. I have been proud to lead the way in support of advanced manufacturing initiatives like Manufacturing USA at the federal level, to help leverage the talent of our innovative private sector and world-class educational institutions—institutions like Ozarks Technical Community College, which is currently building a new state of the art education facility to help harness the talent of Missouri's workforce and bring prosperity and progress in advanced manufacturing not only to southwest Missouri, but the whole nation. Ms. Locascio, in your opinion, how important is Manufacturing USA in strengthening U.S. competitiveness and innovation, including with respect to technology, supply chain issues, and workforce development? Further, how important is U.S. leadership in advanced manufacturing, in terms of our economic well-being and national security?

Response:

The Manufacturing USA Program and its network of 16 institutes, supported by NIST, the Department of Defense, and the Department of Energy, are a critical part of America's overall goal to bring manufacturing back and strengthen U.S. competitiveness and innovation. Nearly 2,000 companies, universities, and non-profit organizations from across the U.S. participate in these institutes which serve as innovation hubs for manufacturing, providing real value to U.S. industry. These hubs will position the U.S. to compete globally in existing and emerging critical technologies. These hubs benefit the public by outreach to local K–12 students and teachers, stimulating workforce development in new technical fields, and providing for improved job opportunities. If confirmed, I would look forward to supporting you in the continued growth and acceleration of this important program for the Nation.

Throughout the pandemic, the U.S. has become increasingly aware of fragile vulnerabilities and dislocations in our supply chain that have had clear economic impact and potential national security impact. Many of the supply chain disruptions have been caused by the offshoring of major manufacturing in the U.S. over the course of the last several decades. The loss of manufacturing base in this country has also decimated many towns and cities all over America impacting the quality of life for so many. It is critical for economic security, national security, and quality of life, that we bring back a strong manufacturing base to the U.S. If confirmed, I will work with this committee through NIST programs – Manufacturing USA, MEP, and the NIST labs – to help accomplish this goal.

**Senator Ron Johnson**

_**Question 1**__:_ I hear from just about every manufacturer I meet with that they cannot find enough skilled workers.

- Do you believe the current U.S. policies and institutions prepare workers for the jobs required by manufacturers?

- If not, what do you believe would correct the skills mismatch and worker shortage described by U.S. manufacturers?

Response:

I believe we can do more to prepare workers for jobs required by manufacturers. The NIST MEP program and Manufacturing USA institutes can be part of this solution working in partnership with every state in the country engaging with local industries, universities, community colleges and trade schools. If confirmed, I will work with this committee to prioritize workforce development for manufacturing in the U.S.

_**Question 2**__:_ What will you do, if confirmed as Director of NIST, to support and encourage pathways to the trades that do not require college degrees?

Response:

If I am confirmed as the next NIST Director, I would prioritize workforce development for manufacturing in every state by working through the NIST MEP and Manufacturing USA programs. These programs already engage closely with regional stakeholders and, if appropriately resourced, can assess the workforce needs and promote workforce development through local and regional entities. The national network can also serve to share best practices and programs that can become national training programs.

_**Question 3**__:_ The Biden Administration supports tariffs and expanding Buy American provisions. Do you believe protectionist policies create resilient and competitive businesses and industries?

Response:

I believe that our current issues related to global competitiveness will be best addressed through well-constructed multifaceted solutions grounded in data. If I am confirmed, I will work with this committee to ensure NIST's policy solutions are grounded in data.

Question 1: I share your passion for supporting female leadership and encouraging more participation of women in STEM, especially amongst our young women and girls. As the first female Senator from West Virginia, I have worked to inspire other young women to pursue leadership positions and instill confidence in themselves.

- If confirmed, will you work with me on this issue?

- Would you also be willing to visit West Virginia, again, and do an event focused on encouraging young women into STEM?

Response:

As you mentioned, this is a subject that I have been extremely passionate about throughout my career. I would truly look forward to working with you on this issue. I would be happy to visit West Virginia to speak with young women about pursuing STEM fields. Thank you for this invitation. It would be a pleasure.

Question 2: Growing up in a small Appalachian town, I am sure you are familiar with the struggles and obstacles facing rural academic institutions and their having access to federal research support. Thankfully this Committee, and the full Senate, passed the United States Innovation and Competition Act (USICA) which takes a number of steps to build research and education capacity in more rural states. Could you speak to the importance of a more balanced geographic distribution of federal research funding?

Response:

I truly believe that all areas of the U.S. must have better access to research funding so that every state and every person can have the ability to participate in our innovation economy. The U.S. has a wealth of talent and capacity in every state. It will be important to take advantage of all our strengths and drive innovation beyond Silicon Valley, Boston, and New York. NIST has a strong foundation of rigorous and open competition for resources and funds work across the country. If confirmed, I will work to ensure that NIST continues the efforts and works to create new opportunities for underserved communities. In this worldwide distributed economy with a strong competitor, we just cannot afford to leave anyone behind.

Question 3: Thank you for mentioning the importance of the Manufacturing Extension Partnership (MEP) Program in your testimony. In West Virginia, the WVU Industrial Extension – West Virginia's representative of NIST's MEP National Network – has been doing exceptional work across the state. These partnerships are critical to bridge small and medium companies with economic development partners, industry focused agencies, and third-party providers. If confirmed, do you commit to support the MEP Program?

Response:

In FY 2020, the MEP National Network interacted with 27,574 manufacturers, leading to $13.0 billion in new and retained sales, $2.7 billion in cost savings, $4.9 billion in new client investments, and helping to create and retain 105,748 U.S. manufacturing jobs. I believe the MEP, working in every state in close partnership with local and regional assets, is critical to building a more healthy and vibrant manufacturing base all across the U.S. If confirmed, I commit to support the MEP program and its extensions in West Virginia and beyond.

Question 4: This Congress I, along with my Senate colleague Senator Peters, reintroduced the Composite Standards Act. This legislation would establish a design data clearinghouse to disseminate existing guidelines and standards for using composite materials in infrastructure projects. This would support the work being done in universities across the country, but especially at WVU as a member of the NSF's Center for the Integration of Composite into Infrastructure (CICI). Could you speak to the importance of incorporating composite technology into rebuilding our nation's roads and bridges?

Response:

NIST has a robust research programs in materials design and testing and also in building, infrastructure and community resilience. It is critical that we design new infrastructure and shore up existing infrastructure using state-of-the-art materials and approaches. If confirmed, I would look forward to discussing this important issue and the accompanying legislation with you.

Question 1: This past June, the Surfside community and the entire State of Florida experienced a tremendous loss when Champlain Towers South tragically and unexpectedly collapsed, taking innocent lives and devastating hundreds of families. In your position, how will you ensure NIST properly investigates this in a timely manner to learn what happened and do what is needed to prevent another tragedy?

Response:

The collapse of Champlain Towers South was a tragedy that has had devastating impacts. It is my understanding that NIST, working under the authority of the National Construction Safety Team Act, sent a team of experts to Surfside to launch a full technical investigation working in close partnership with the State of Florida, the local community, and other federal partners. As it has done in the past, NIST will conduct a thorough and complete investigation to determine technical cause. From the results of that investigation and analysis, NIST may recommend changes that will lead to improved building safety for Surfside, the state of Florida and across the U.S. If confirmed, I ensure you that NIST will work diligently to complete this work in partnership with the State. It is critical that this be done in a timely manner to prevent, wherever possible, another tragedy from occurring.

Question 2: What would you do to combat Communist China's growing aggression to influence standards setting organizations?

Response:

Standards have become a key battleground in the global competition for technology leadership. Backed by the People's Republic of China (PRC), Chinese companies have greatly increased their participation in international standards development organizations (SDOs). Although participation is not an indicator of influence when it comes to technical standard outcomes, it does appear this part of a broader effort by the PRC to influence critical and emerging technology areas. In particular, the PRC is aggressively seeking leadership roles in strategic areas such as advanced communications (5G, 6G, and beyond) and artificial intelligence (AI).

I know from my own experience in the international standards arena while previously with NIST, that increased participation in standards development is something we must take seriously. Engagement in documentary standards development is a critical element of the NIST mission where NIST works to ensure the U.S. approach to international standards development is based on the principles of transparency; openness; impartiality, and consensus. If confirmed, I look forward to working with Congress in developing aggressive strategies to strengthen the U.S. Standards system in ways that (1) promote robust U.S. participation in international standards development organizations; and (2) increase U.S. R&D coordination and cooperation with likeminded partners and allies.