Executive Summary: Cybersecurity Potential of the Savannah River Site

The security and resiliency of the U.S. Energy Sector, often considered to be *the* point-of-failure for all other critical infrastructure sectors, is of paramount importance to the Nation's economy, public health and safety, and way of life. The U.S. Department of Energy's (DOE) and the Department of Homeland Security (DHS) classified and non-classified portfolio of responsibilities touches virtually every aspect of our energy sector, including energy manufacturers and suppliers, the energy grid, and our Nation's nuclear weapons stockpile.

According to annual DOE OIG evaluations, cybersecurity and cyber-hygiene within Energy sector entities under the DOE are lacking. Sensitive information, vital systems, and critical assets are exposed to malicious compromise as a result. In response to the apparent need, ICIT conducted a strategic assessment to better understand the cybersecurity posture of the DOE and DHS, proposed cybersecurity policies and strategies, and whether the Savannah River Site (SRS) resources, facilities, and capabilities could be leveraged to enhance the security and resiliency of the critical infrastructure assets. The SRS Community Reuse Organization (SRSCRO) brought this concept to the attention of ICIT in the first quarter of 2018.

The SRSCRO is a 501(c)(3) private nonprofit organization charged with developing and implementing a comprehensive strategy to diversify the economy of a five-county region in the Central Savannah River Area of Georgia and South Carolina. SRSCRO counties include Aiken, Allendale, and Barnwell in South Carolina and Richmond and Columbia in Georgia.

The Savannah River Site covers 310 square miles near Aiken, South Carolina. The Site is situated in parts of Aiken, Barnwell, and Allendale counties in South Carolina. However, the impact area of the Site extends into Georgia to Richmond and Columbia counties. This five-county area is the SRS Impact Area. The Savannah River Site has been a key economic driver in the surrounding five-county region since its establishment in the early 1950s.

SRS was constructed during the early 1950s to produce the basic materials used in the fabrication of nuclear weapons, primarily tritium and plutonium-239. Five reactors were built to produce these materials. Several support facilities were also built including two chemical separations plants, a heavy water extraction plant, a nuclear fuel and target fabrication facility, a tritium extraction facility, and waste management facilities. Between 1953 and 1988, SRS produced and shipped about 36 metric tons of plutonium.

After 50 years of producing nuclear materials for defense and non-defense uses, SRS shifted its strategic direction and resources from nuclear weapons materials production to the cleanup of

the nuclear waste and environmental contamination created during production. In support of national defense and US nonproliferation efforts, SRS now processes and stores nuclear materials.

The primary Department of Energy programs and mission areas at SRS are Environmental Management (EM) and National Nuclear Security Administration (NNSA). EM represents 68 percent of the current budget. This includes management, stabilization, and disposition of nuclear materials; management and disposition of solid, liquid and transuranic wastes; spent fuel management; and environmental remediation and cleanup. Thirty-two percent of the budget is related to the NNSA including tritium operations and extraction; helium-3 recovery; nonproliferation support; mixed oxide (MOX) fuel fabrication; uranium blending and shipping; and foreign fuel receipts.

SRS is also home to the Savannah River National Laboratory (SRNL). It is the newest of all the National Laboratories and the only laboratory under DOE's Environmental Management purview. SRNL is a small multi-program, multi-purpose laboratory compared to other National Laboratories. However, it is uniquely positioned to meet current and future energy and national security challenges and missions.

Applied research is one unique aspect offered by SRNL. As an applied research and development laboratory, SRNL supports customers at SRS, throughout DOE, at other federal agencies, across the country, and around the world. The laboratory currently serves the nation in three major program areas: (1) National and Homeland Security, (2) Energy Security, and (3) Environmental and Chemical Process Technology. For example, SRNL is the FBI "Hub Lab" for pre-detonation forensics.

ICIT's analysis found that the "global" SRS is uniquely positioned in a region rife with innovation, strategic synergies, low-economic barriers, an engaged community, and tantalizing economic incentives. Cybersecurity is already central to SRS, and a slight transition could position it as a Cybersecurity Leader in National Security and Critical Infrastructure missions. Finally, regional universities and technical colleges are evolving to serve public and private sector needs in the area and can generate a sufficient well-trained workforce to sustain significant cybersecurity missions within the SRS.

No single lab, organization, or entity is solely responsible for securing the Energy sector, national security, or other critical infrastructure systems. DOE and DHS are tasked with the responsibility of securing the electric grid and other energy assets; however, the sector consists of a complex matrix of micro-grids and systems that are predominantly owned by private organizations that rely on public infrastructure. Complex regulatory challenges, technical obstacles, and ownership ambiguities further obfuscate and complicate the digital landscape surrounding assets that are frequently beleaguered by a variety of sophisticated and unsophisticated adversaries originating from multiple nations.

The Savanah River Site is ideally positioned and equipped to assist in the national security missions and the defense of the energy grid and other critical infrastructure assets. It could evolve to serve one or more of the following roles:

1) Secure Operations Center (SOC)
2) Vulnerability, Exploit, and Malware Clearinghouse
3) Cyber-kinetic Attack Emulation Site
4) Gamification and Emulation Site
5) Workforce Development Leader
6) Cyber-hygiene Educator
7) IT-OT Mitigation and Remediation Testing bed

Summary of key findings in support of SRS leadership in the Energy sector, Defense sector, and Critical Infrastructure cybersecurity leadership:

- Strong regional synergies and collaborative initiatives.
- The SRS is ideally situated and equipped to play a role in critical infrastructure cybersecurity.
- Development costs in the region are low.
- Investment and growth in the area are historically stable and is likely to increase.
- Low cost of living and regional incentives may draw external talent to the area and SRS.
- The SRS is situated and equipped for onsite and offsite cybersecurity missions.
- SRNL has a robust cybersecurity and cyber-hygiene reputation.
- The site has space and facilities to host emulation and gamification exercises.
- Augusta University is affiliated with SRS and offers numerous cyber-related degrees.
- USC Aiken is also affiliated with SRS and is improving its computer science, cybersecurity, and engineering degrees.
- Regional K-12 efforts will increase the cybersecurity workforce in the near future.