

A Review of U.S. Navy Cyber Defense Capabilities

Committee

James R. Gosler

Co-Chair

Mr. James R. Gosler is currently an independent consultant, having retired from Sandia National Laboratories, where he served as a fellow for information operations. His early contributions included establishing a performance modeling/ simulation program in the data processing operating systems design area and developing attack methodologies for both cryptographic and nuclear weapon systems in the adversarial analysis group. In 1989, Mr. Gosler was invited by the National Security Agency to serve as Sandia's first visiting scientist. During his 2-year assignment, he consulted on computer security concerns and established/chaired key information security research working groups. Upon his return to Sandia, he was named manager of the Software Adversarial Analysis Department. In 1993, he established and directed the Vulnerability Assessments Program and was named assistant director of the Systems Assessment and Research Center. He has completed numerous professional courses and schools, including the National Senior Cryptologic Course, the National Senior Intelligence Course, Harvard's Program for Senior Executives in National and International Security, Aspen Institute's Senior Executive Seminar, and the Intelligence Fellows Program. A member of the Naval Studies Board, Mr. Gosler is a retired Captain in the U.S. Naval Reserves and has served on numerous scientific boards and advisory committees, to include as co-chair of the recent Defense Science Board report entitled Resilient Military Systems and the Advanced Cyber Threat and as a member of the NRC Committee on Improving Cybersecurity Research in the United States.

Miriam E. John

Co-Chair

Dr. Miriam E. John is currently an independent consultant, having retired from Sandia National Laboratories after 28 years of service. Her last position was Vice President of Sandia's California Laboratory in Livermore. During her Sandia career, she worked on a wide variety of programs, including nuclear weapons, chemical and biological defense, missile defense, and solar energy, and provided leadership for a number of the laboratory's energy, national security, and homeland security programs. She is a senior fellow of the Department of Defense (DOD) Defense Science Board and a member of its Threat Reduction Advisory Committee. She also serves on the board of directors of the National Institute for Hometown Security and as chair of the California Council on Science and Technology. She is a past member of the Air Force Scientific Advisory Board, the Board on Army Science and Technology, and Department of Energy (DOE) National Commission on Science and Security. She was appointed a National Associate of the National Academies of Science and Engineering and a member of the Beckman Center Advisory Board. Other memberships include the board of advisors for MIT Lincoln Laboratory, the board of directors for Draper Laboratory, the external advisory board of Savannah River National Laboratory, the board of directors of SAIC and the Strategic Advisory Board for RedX Defense Systems. She is also a member of the director's review committee for the National Ignition Facility at Lawrence Livermore National Laboratory, and has served on the director search committees for both Lawrence Livermore National Laboratory and Los Alamos National Laboratory. She is a member of the dean's advisory board for the School of Science and Engineering and chairs the advisory board for the Department of Chemical and Biomolecular Engineering at Tulane University, where she has been recognized as an outstanding alumna. She is currently the chair of the Naval Studies Board; has previously served as chair of NRC Committee for an Assessment of Non-Lethal Weapons Science and Technology, NRC Committee for an Assessment of Naval Forces' Defense Capabilities Against Chemical and Biological Warfare Threats, and NRC Committee on Determining Core Capabilities in Chemical and Biological Defense Research and Development; and has previously served as co-chair of the NRC Committee on the Role of Naval Forces in the Global War on Terror.

Donna M. Gregg

Member

Ms. Donna M. Gregg is the business area executive of the Cyber Operations Business Area at The Johns Hopkins University Applied Physics Laboratory (JHU/APL). In this role, she leads strategy development and research investment for cyber operations, with an emphasis on integrated cyber defense, cyber situational awareness and computer network operations. From 2005 to 2011, Ms. Gregg served as the managing executive and branch supervisor of the Information Systems Branch. In these roles she led the development of APL's technical organization focused on communications engineering and cyber operations. Using systems engineering, advanced system development, networking technologies and computer network operations, this organization built technologies and systems to counter terrorism and cyber warfare. Prior to these roles, Ms. Gregg served as group supervisor of APL's first Information Operations Group and performed systems engineering and analysis on national strategic communications systems. Ms. Gregg holds a bachelor's degree in mathematics from the University of Maryland and a master's degree in mathematics from The Johns Hopkins University.

Robert L. Grossman

Member

Dr. Robert L. Grossman is the chief research informatics officer (CRIO) and a faculty member in the Biological Sciences Division at the University of Chicago. He is a core faculty and senior fellow at the Computation Institute and the Institute for Genomics and Systems Biology. Dr. Grossman is also the founder and a partner of Open Data Group, provides analytic services to help companies and organizations build predictive models over big data, and is also the director of the not-for-profit Open Cloud Consortium, which provides cloud computing infrastructure to support the research community. He was a 2013 Federal 100 Award Winner. Dr. Grossman recently co-chaired a Defense Science Board report entitled Cyber Security and Reliability in a Digital Cloud.

Barry M. Horowitz

Member

Dr. Barry M. Horowitz (NAE) is professor of systems engineering at the University of Virginia where his areas of expertise include the design and development of large-scale networks and information systems; application of security technology to large, network-based commercial systems; and design of large systems which involve coupling private data systems or mission critical support systems with open networks, such as the Internet. Previously, Professor Horowitz served as chairman and founder of Concept Five Technologies and as president and chief executive officer of the MITRE Corporation and of Mitretek Systems. A member of the National Academy of Engineering, he has served on numerous scientific boards and advisory committees, including as co-chair of the NRC Committee on Information Assurance for Network-Centric Naval Forces and as a former member of the Naval Studies Board.

Richard J. Ivanetich

Member

Dr. Richard J. Ivanetich is institute fellow at the Institute for Defense Analyses (IDA), having been appointed to that position in 2003. His experience spans a number of areas of defense systems, technology, and operations analyses, relating primarily to command and control systems and procedures, cyberspace operations, computer and information systems, modeling and simulation of systems and forces, crisis management, and strategic nuclear forces. His previous positions at IDA include director of the Computer and Software Engineering Division (1990-2002) and assistant director of the System Evaluation Division (1985-1990). Prior to joining IDA in 1975, Dr. Ivanetich was assistant professor of physics at Harvard University (1969-1974). He has served on numerous scientific boards and advisory committees, such as the Nuclear Command and Control and Cyber Panels of the U.S. Strategic Command Strategic Advisory Group (2006 to today), the Naval Studies Board (1998-2004), the DARPA Information Science and Technology Study Group (1990-2004), and as advisor to the Missions Committee of the Sandia Corporation Board of Directors (2009-2010). In 2003, Dr. Ivanetich was elected a National Associate of the National Academies.

Terry P. Lewis

Member

Dr. Terry P. Lewis is site executive and senior systems engineer with the Raytheon Company, where his areas of expertise include command, control, communications, and information systems; digitized battlespace systems; communications and transmission security in military tactical systems; wireless network security; and network management authentication techniques for robust security architecture. In addition, Dr. Lewis has developed anti-tampering technologies to prevent or reduce the ability of potential aggressors to reverse-engineer critical U.S. communications technologies. He is a Raytheon fellow and received the Most Promising Engineer of the Year award conferred at the 2002 Black Engineer of the Year Award Conference. Dr. Lewis is a member of the Naval Studies Board and served as a member of the NRC Committee on Distributed Remote Sensing for Naval Undersea Warfare.

Steven B. Lipner

Member

Mr. Steven B. Lipner is partner director of software security in trustworthy computing at Microsoft Corporation. His expertise is in software security, software vulnerabilities, Internet security, and organization change for security. He is responsible for the Security Development Lifecycle (SDL) team that has delivered processes, tools and associated guidance and oversight that have significantly improved the security of Microsoft's software. Mr. Lipner has over 40 years of experience as a researcher, development manager, and general manager in IT security. He served as executive vice president and general manager for Network Security Products at Trusted Information Systems and has been responsible for the development of mathematical models of security and of a number of secure operating systems. Mr. Lipner was one of the initial 12 members of the U.S. Computer Systems Security and Privacy Advisory Board (now the Information Security and Privacy Advisory Board) and served two terms and a total of ten years on the board. He is the author of numerous professional papers and has spoken on security topics at many professional conferences. He is named as inventor on 12 U.S. patents and two pending applications in the fields of computer and network security and has served on numerous scientific boards and advisory committees, including as a current member of the NRC Committee on Future Research Goals and Directions for Foundational Science in Cybersecurity.

Arthur L. Money

Member

The Honorable Arthur L. Money (NAE) is an independent consultant and former Assistant Secretary of Defense for Command, Control, Communications and Intelligence (C3I) in which he was the senior civilian official in DOD with C3I responsibilities and chief information officer (CIO). Mr. Money also served as Assistant Secretary of the Air Force for Research, Development and Acquisition and served as CIO. Prior to joining DOD, he was president of ESL Inc., a subsidiary of TRW. Mr. Money has more than 50 years of management and engineering experience with the defense electronics industry and intelligence community in the design and development of intelligence collection analysis capabilities and airborne tactical reconnaissance systems. Throughout his career, Mr. Money has been recognized for his vision, leadership, and commitment to excellence in systems and process reengineering. He is a member of the National Academy of Engineering.

Fred B. Schneider

Member

Dr. Fred B. Schneider (NAE) is Samuel B. Eckert Professor of Computer Science at Cornell University; and concurrently serves as chief scientist of the National Science Foundation-funded TRUST Science and Technology Center, which brings together researchers at the University of California at Berkeley, Carnegie-Mellon, Cornell, Stanford, and Vanderbilt. A member of the National Academy of Engineering, Professor Schneider's research interests include trustworthy systems--specifically, systems that will perform as expected despite failures and attacks. His early research interests included formal methods to aid in the design and implementation of concurrent and distributed systems that satisfy their specifications. He is also known for his research in theory and algorithms for building fault-tolerant distributed systems. More recently, Professor Schneider's research interests have turned to system security, and his work characterizing what policies can be enforced with various classes of defenses is widely cited and it is seen as advancing the nascent science base for security. Professor Schneider has served on numerous scientific boards and advisory committees, including as a member of the NRC's Computer Science and Telecommunications Board, and served as Editor of the 1998 NRC report Trust in Cyberspace. He is a fellow of the American Association for the Advancement of Science, the Association of Computing Machinery, and the Institute of Electrical and Electronics Engineers; he is also a past member of the Defense Science Board. He is also a member of the Norwegian Academy of Technological Sciences (Norges Tekniste Vitenskapsakademi), the U.S. National Academy of Sciences, and is a recently appointed member of the Naval Studies Board.

Paul A. Schneider

Member

The Honorable Paul A. Schneider is a defense and aerospace consultant, and principal of The Chertoff Group—an organization aimed at providing security, risk management, and merger/acquisition advisory services for U.S. government and corporate clients around the world. Previously, Mr. Schneider served first as the under secretary for management and subsequently as the deputy secretary and chief operating officer of the Department of Homeland Security (DHS). Prior to joining DHS, Mr. Schneider served in a number of U.S. government capacities, including senior acquisition executive of the National Security Agency (NSA), where he was responsible for oversight and execution of signals intelligence and information security development and acquisition programs; principal deputy assistant secretary of the Navy for research, development and acquisition, where he was responsible for the oversight and execution of Navy and Marine Corps research, development and acquisition programs; and executive director and senior civilian of the Naval Sea Systems Command, the Navy's largest ashore organization, where he was responsible for the day-to-day operations of shipyards, laboratories, and engineering and test facilities. Mr. Schneider serves on numerous scientific boards and advisory committees, including as the current chair of the Armed Forces Communications and Electronics Association's Homeland Security Committee and is a recently appointed member of the Naval Studies Board.

William O. Studeman, USN, Ret.

Member

ADM William O. Studeman, USN (Ret.) is currently an independent consultant, having retired from Northrop Grumman Corporation in 2005 as vice president and deputy general manager of mission systems where he focused on strategies, program, business development, marketing, as well as corporate cross-sector integration, and on managing defense and intelligence technology partnerships and concepts related to net centrality/cyber matters, ISR (intelligence, surveillance, and reconnaissance), IO/IW (information operations/information warfare), aerospace and advanced command environments. He served in this position for 9 years. ADM Studeman retired from the U.S. Navy with the rank of Admiral after 35 years of service as a restricted line naval intelligence officer and his flag tours included Director of Long Range Navy Planning, Director of Naval Intelligence, Director of National Security Agency, and Deputy Director of Central Intelligence and the Central Intelligence Agency. Today, Admiral Studeman is the Chairman Emeritus of the Board of the Naval Intelligence Foundation and senior advisor to the Naval Intelligence Professionals Association. He also serves on numerous scientific boards and advisory committees, to include as a recent member of the NRC Committee and is the 2007 recipient of the William Oliver Baker Award (by the Intelligence and on the Policy Consequences and Legal/Ethical Implications of Offensive Information Warfare).