

Defending Forward-Deployed U.S. Navy Platforms from Potential Enemy Missile and Rocket Attacks

Committee

Ronald R. Luman

Co-Chair

DR. RONALD R. LUMAN, Co-Chair, is chief of staff of the Johns Hopkins University (JHU) Applied Physics Laboratory, where he previously served as assistant director for strategy and head of the National Security Analysis Department. He has a broad technical experience base, including leadership roles in design, development, test, and evaluation of undersea systems, missile and navigation systems, ballistic missile defense, and intelligence systems architectures. A current member of the Naval Studies Board (NSB), Dr. Luman has served on a number of scientific boards and advisory committees, including as a member of the National Academies of Sciences, Engineering, and Medicine's Committee on the Role of Naval Forces in the Global War on Terror, the Committee on National Security Implications of Climate for U.S. Naval Forces, and the Committee on Mainstreaming Unmanned Undersea Vehicles into Future U.S. Naval Operations—all of which were conducted under the auspices of the NSB. He is also chair of the Systems Engineering Program in the JHU Whiting School of Engineering and is a 2015 inductee to the George Washington University Engineering Hall of Fame where he also received a doctor of science in systems engineering.

Paul A. Schneider

Co-Chair

THE HONORABLE PAUL A. SCHNEIDER, Co-Chair, is an independent consultant with specific interest in defense and aerospace issues. He was previously a principal of the Chertoff Group—an organization aimed at providing security, risk management, and merger/acquisition advisory services for the 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. He is also the current chair of the NSB and served as the co-chair of the Academies' Committee on Mainstreaming Unmanned Undersea Vehicles into Future U.S. Naval Operations and served as a member of the Committee for a Review of U.S. Navy Cyber Defense Capabilities. Mr. Schneider received a B.S. in nuclear engineering from the University of Massachusetts, Lowell.

Melvin L. Belcher

Member

MR. MELVIN L. BELCHER, JR., is a principal research engineer and director of the Sensors and Electromagnetic Applications Laboratory at the Georgia Tech Research Institute (GTRI). He oversees radar and electronic warfare research at GTRI as well as the development of associated sensor systems and technologies, providing strategic leadership at GTRI in these areas. Mr. Belcher serves as the leading GTRI subject-matter expert in ballistic missile defense, multiple-function phased-array radar systems engineering, precision fire control, and high-resolution radar. He is a senior independent evaluator for the Intelligence Community and assesses foreign radar systems and technologies. Mr. Belcher served in an embedded position within the Missile Defense Agency as the technical director of the Sensors Knowledge Center. He has led and currently contributes to numerous short courses at GTRI, including the phased-array radar, radar signal processing, pulse Doppler radar, coherent radar, and modern radar short courses. He is a member of the Institute of Electrical and Electronics Engineers and was named GTRI Researcher of the Year in 1992 for efforts in high-resolution radar signal processing. Previously, he has worked with Northrop Grumman Mission Systems, Dynetics, Inc., and the NSA. He received a B.S.E.E. from Auburn University and a M.S.E.E. from the Georgia Institute of Technology.

Melvin H. Eisman

Member

MR. MELVIN H. EISMAN is a senior cost/operations research analyst in the Engineering and Applied Sciences Department at the RAND Corporation. Prior to joining RAND in 1994, he worked at TRW Defense Systems Division, Northrop Grumman Aircraft Division, Magnavox Advanced Products and Systems Company, General Dynamics, Naval Air Systems Command, and the Naval Aviation Logistics Center. At RAND, Mr. Eisman has generated systems' life cycle cost estimates for analysis of alternative studies on future Air Force airborne tanker and electronic airborne attack options and participated in cost-effectiveness studies of (1) unmanned airborne systems platform/sensor force mix options for performing future Air Force missions; (2) space-based and airborne intelligence, surveillance, and reconnaissance systems force mix options; (3) Air Force-distributed small satellites over larger monolithic satellites; and (4) reusable launch vehicle options for supporting future Air Force space missions; and (5) countermeasures and other security initiatives for improving passenger security at rail stations and airports. In addition, Mr. Eisman has led two Army studies on assessing the costs and benefits of contractor product logistics support over organic logistics support courses of action. He was involved in assessing the utility of value models developed for the Defense Advanced Research Projects Agency's System F6 Fractionated Spacecraft Program within a Department of Defense (DoD) acquisition context. He was also recently part of a RAND research team for the DoD tasked with assessing the causal factors for improving military space acquisitions in delivering capabilities within cost and schedule. He led a RAND team that performed an independent program cost and risk assessment on one of the NASA Jet Propulsion Laboratory's earth orbiting satellite missions. He was a committee member on the congressionally mandated Academies' study "An Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives." He is currently the RAND representative to the Air Force/NASA Space Systems Cost Analysis Group and a member of the American Institute of Aeronautics and Astronautics. He was a committee member on the congressionally mandated Academies' study "An Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison to Other Alternatives." Mr. Eisman received an M.S. in industrial engineering from Pennsylvania State University.

Vishal Giare

Member

MR. VISHAL GIARE is the program area manager for Aegis Ballistic Missile Defense (BMD) Programs for JHU's Applied Physics Laboratory. He is responsible for the strategic planning, execution, and performance of the laboratory's Aegis BMD programs, spanning combat and missile systems engineering, future system development, flight test and evaluation, and capability introduction to the fleet. He manages a 300-staff member team charged with ensuring the technical integrity of the integrated Aegis BMD system, a critical warfighting capability serving to enhance U.S. missile defenses. Mr. Giare received a B.S. in physics from the University of Tennessee and M.S. degrees in physics and electrical engineering-systems from the University of Michigan. He has completed the Senior Executives in National and International Security Program at the Harvard University Kennedy School of Government.

Tamara E. Jernigan

Member

DR. TAMARA E. JERNIGAN is deputy principal associate director at Lawrence Livermore Laboratory (LLNL), an organization responsible for ensuring the safety, reliability, and security of the U.S. nuclear stockpile in the absence of testing through a comprehensive science-based program. Dr. Jernigan joined LLNL as principal deputy associate director for the Physics and Advanced Technologies Directorate. Prior to her tenure at LLNL, she served as a NASA astronaut from 1985 to 2001. Dr. Jernigan is a veteran of five space shuttle missions where she supervised the pre-flight planning and in-flight execution of critical activities aboard STS-40, 52, 67, 80, and 96, including an 8 hour spacewalk while docked to the International Space Station. She is a current member of the Academies' NSB and recently served on the Committee on the NASA Technology Roadmap. Dr. Jernigan received a B.S. in physics and an M.S. in engineering science from Stanford University and a Ph.D. in space physics from Rice University.

Annette J. Krygiel

Member

DR. ANNETTE J. KRYGIEL is an independent consultant with expertise in the management of large-scale systems, particularly in regard to software development and systems integration. She served at the Institute for National Strategic Studies at the National Defense University, where she wrote a book on large-scale system integration. Prior to that, she was director of the Central Imagery Office (CIO), a DoD combat support agency, until CIO merged into the agency now known as the National Geospatial Intelligence Agency. Dr. Krygiel began her career at the Defense Mapping Agency, where she held various positions including chief scientist. A former member of the Academies' NSB, Dr. Krygiel also served as chair of the Committee on the Role of Experimentation in Building Future Naval Forces and more recently as a member of the Committee on U.S. Naval Forces' Capabilities for Responding to Small Vessel Threats, the Committee on Capability Surprise on U.S. Naval Forces, and the Committee on Mainstreaming Unmanned Undersea Vehicles into Future U.S. Naval Operations. She received a D.Sc. in computer science from Washington University in St. Louis.

Katherine A. McGrady

Member

DR. KATHERINE A.W. McGRADY is president and CEO, CNA (CNA is a nonprofit research organization that operates the Center for Naval Analyses and the Institute for Public Research). She was appointed to that position in May, 2015. In 2009, Dr. McGrady was appointed as CNA's first chief operating officer, where she was responsible for the execution of CNA's strategy and business processes, assuring consistency of policy and approach across the organization, and maintaining an environment of accountability and high research performance. She began her career with CNA as an analyst in 1988 and as the field representative to the Commander of Marine Forces Central Command and Commander, I Marine Expeditionary Force, serving in the Persian Gulf during the first Iraq war (Desert Shield and Desert Storm). Dr. McGrady received the Department of Navy's Superior Public Service Award for her contributions during Desert Shield/Desert Storm. She also deployed as part of the Unified Task Force to Mogadishu, Somalia. Subsequent assignments led to her selection as vice president and director, Integrated Systems and Operations division, where she led a team focused on issues at the interface between the Navy and Marine Corps, including analysis of expeditionary systems, logistics, operations and tactics, and training for expeditionary operations. Simultaneously, she directed the Marine Corps Program, where she developed the annual research program and was the primary interface between CNA and the senior Marine Corps leadership. In 2004, Dr. McGrady became CNA's senior vice president for research, providing oversight of research planning, research quality, cross-division staffing, and hiring, development, and training of research staff. She received a Ph.D. and M.S. in macromolecular science and engineering (polymer chemistry) at the University of Michigan, Ann Arbor, and a B.S. in chemistry from Smith College.

Arthur L. Money

Member

THE HONORABLE ARTHUR L. MONEY 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 (a former U.S. corporation involved in a variety of businesses, including aerospace and defense). Mr. Money has more than 50 years of management and engineering experience with the defense electronics industry and the 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. In 2012, Mr. Money was the 28th Annual William Oliver Baker Award Recipient, for life time service to the Intelligence Community and for National Security. A member of the NAE, he is a member of the NSB and recently served as a member of the Academies' Committee for a Review of U.S. Navy Cyber Defense Capabilities. He received a M.S.M.E. from Santa Clara University.

J. P. Reason, USN (Ret.)

Member

ADM J. PAUL REASON, USN (Ret.), is an independent consultant, having retired from the U.S. Navy with the rank of admiral after 35 years of service. The Navy's first African American to make four-star rank, Admiral Reason's last assignment was Commander, U.S. Atlantic Fleet, where his duties included the training, maintenance, and readiness of naval forces deployed to the Mediterranean and Caribbean seas, South America, and the Persian Gulf. (He was also responsible for the operations of most U.S. Navy bases and facilities along the East and Gulf coasts of the United States, in Puerto Rico, Cuba, and Iceland.) He is a nuclear-trained surface warfare officer with more than 20 years of experience at sea. Ashore he served as Deputy Chief of Naval Operation for Plans, Policy and Operations; Commander, Naval Surface Force Atlantic; and Commander, Naval Base Seattle. Following military retirement, Admiral Reason served on numerous corporate boards; among them, Amgen, Norfolk Southern and Wal-Mart boards of directors. His Academies' experience includes serving as co-chair of the Committee for Capability Surprise on U.S. Naval Forces and serving on the Committee on U.S. Naval Forces' Capabilities for Responding to Small Vessel Threats and the Committee on the Committee on the "1,000 Ship Navy"—A Distributed and Global Maritime Network. He is a current member of the NSB. He is a graduate of the Naval Academy, and he received an M.S. from the Naval Postgraduate School.

Katherine A. Rink

Member

DR. KATHERINE A. RINK is the assistant division head of the Air, Missile and Maritime Defense Technology Division at MIT Lincoln Laboratory, which develops and assesses new technologies and integrated systems for defense against ballistic missiles, cruise missiles, and air vehicles in tactical, regional, and homeland defense applications. Before this, she served for 2 years as the group leader of the Advanced Concepts and Technologies Group, developing and integrating advanced air and missile defense capabilities across DoD and the Services, with particular emphasis on developing new technologies for the U.S. Navy to address the advanced missile threat. Dr. Rink joined MIT Lincoln Laboratory in 1999 as a member of the technical staff in the Systems Engineering and Analysis Group, where she worked on many technical aspects of the then-emerging Aegis ballistic missile defense system, including systems analysis, tracking, discrimination, prototyping, and flight test analysis. She led the Laboratory's Aegis ballistic missile defense program and later led the development of advanced air and missile defense capabilities and electronic warfare prototypes for the U.S. Navy. Dr. Rink received a B.S. in systems science and mathematics, a B.A. in mathematics, and an M.S. and D.Sc. in systems science and mathematics, all from Washington University in St. Louis, with an additional M.S. in operations research from Columbia University.

Allan Steinhardt

Member

DR. ALLAN STEINHARDT transitioned to the West Coast to become chief engineer at AEye, Inc. in March 2017. Formerly he was a science fellow (chief scientist) and senior executive advisor for Booz Allen Hamilton where he leads a team of scientists, engineers, and mathematicians in providing prototyping, portfolio analysis, technology roadmaps, and innovation services to the Office of the Secretary of Defense (OSD). His projects include custom radio frequency signal prototype collection systems for airborne platforms, prototype radar systems integration, and signal processing, and he is a science and technology subject-matter expert to support military intelligence. Previously, Dr. Steinhardt was an assistant professor at Cornell University and a senior staff scientist at the Massachusetts Institute of Technology Lincoln Laboratory. He also spent more than 11 years at the Defense Advanced Research Projects Agency (DARPA), retiring as chief scientist. Dr. Steinhardt is a fellow of the Institute of Electrical and Electronics Engineers (IEEE), in recognition of his work on space time adaptive processing, which is used in the Joint Surveillance and Target Attack Radar System (JSTARS) and related radar systems. Dr. Steinhardt has published more than 100 articles in academic and defense strategy journals and co-authored a book on adaptive radar. He is also an inventor, holding one approved patent with several in review. His work on Householder algorithms has been cited more than 200 times in peer reviewed research journals. He is a current member of the NSB. Dr. Steinhardt has held various leadership positions at IEEE, most recently as two-term chair of the prestigious IEEE Dennis J. Pickard Medal for Radar Technologies and Applications Award Committee. He received a Ph.D. in electrical engineering from the University of Colorado Boulder.