Framing Resilience Through Mission Space

Developing and Assessing Resilient Systems in Support of National Security Missions

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The US Army Engineer Research and Development Center (ERDC) hosted a MORS-sponsored resiliency workshop on April 10–11, 2018 at the Information Technology Laboratory (ITL) in Vicksburg, Mississippi. The workshop, “Developing and Assessing Resilient Systems in Support of National Security Missions,” was attended by 55 participants and facilitators. Participants included representatives from a variety of organizations including academia, industry, NATO, and Department of Defense (DoD) communities.

The purpose of this special workshop was to address methods for developing and assessing the resilient systems needed by US forces and supporting agencies to meet their operational requirements. The workshop also examined the contributions of external forces, such as environmental and political factors, that can impact the performance of these systems or are mission drivers.

Workshop Activities
The workshop activities focused on identifying and mapping feasible solutions to improve the resilience of our nations’ infrastructure and deployable assets, while considering future natural and manmade threats and attempting to modernize capabilities with limited resources. Collaboration and the exchange of information were major components of this workshop, particularly in instances where resilience was considered based on its impact on the virtual, physical, and operational performance of our national and homeland security assets and manpower. A holistic workshop design was framed to collect data on possible challenge topics and concept leads as well as information for mapping a way forward. Products include the development of resilience challenge statements and presentations aimed at addressing challenges, conditions that make it a resilience concern, potential challenge impacts, and proposed concepts to address the identified challenges (see Figure 1). The draft findings will be briefed during the 86th MORS Symposium in June 2018 at the Naval Postgraduate
School and provided to our MORS Sponsors.

The Workshop ERDC Welcome was given by Ms. Patti Duett, Acting Director of the ERDC ITL. The keynote by Dr. David Pittman, Director, US Army ERDC, entitled “Resilience and the ERDC Mission,” provided ERDC context. To frame the workshop and seed discussion, Dr. Schneider moderated a thought leader panel with Dr. Craig Rieger, Idaho National Laboratory, Ms. Sara Lechtenberg-Kasten, KAPSARC, and Dr. Thomas Seager, Arizona State University.

Two lunchtime presentations, “Overcoming Barriers to Greater Scientific Understanding of Critical System Resilience,” by Dr. Dave Alderson, Naval Postgraduate School Center for Infrastructure Defense, and “Blue Roof; US Army Corps of Engineers Reachback Operations Center (UROC) 2017 Hurricane Support,” by Mr. Joe Durkee, UROC, ERDC, further broadened participant technical and operational perspectives toward the understanding and creation of resilience across the lexicon of analysis, response, and recovery.
On the first day, diverse teams actively brainstormed and organized challenges through exercises and team drills to define, understand, and assess resiliency priorities. The second day of the workshop, the teams normed capabilities and concepts that could be applied to address the most challenging concerns, including round robin discussions to explore measures of performance and effectiveness of actions and initiatives supporting resilience.

Working Groups
The working groups were divided into four teams examining 1) prepare for resilient systems, 2) recovery from kinetic/malicious disruptions, 3) recovery from natural disruptions, and 4) adaptation of systems based on lessons learned from disruptions. These stages align with three of the four categories of resiliency as described by Presidential Executive Order 13653 (see Figure 2).

Data Collection and Workshop Report
The observations, data, and feedback collected from participants and facilitators throughout the two-day event, including the 17 integrated exercises, will be coalesced into a final event report for the MORS Sponsors, the MORS Special Meetings Committee, and workshop participants. This report will also be posted on the MORS website for MORS members.

The workshop coordinators would like to thank all those who participated in the resilience workshop and graciously shared their diverse perspectives. The success of the workshop would not have been
possible without the support of the MORS office, specifically Jennifer Ferat, Eric Kokuma, Shelbi Jenkins, Elizabeth Marriott, and Tina Yan. Finally, we extend a special thank you to the workshop facilitators, Dr. Amy Bednar, Mr. James Richards, Mrs. Christina Rinaudo, and Mrs. Swathi Veeravalli, with the US Army ERDC, for helping to navigate participants thorough the exercises, and to the workshop note takers—Mr. Willie Brown, ERDC; Ms. Caitlin Callaghan, ERDC; Ms. Sarah Dobie, Rochester Institute of Technology; and Mr. William Leonard, Mississippi State University—who captured the essence of the group discussions.

Summary
The MORS two-day resilience workshop at the US Army ERDC in Vicksburg, Mississippi, was a highly successful event that brought together members of the resilience community from academia, industry, NATO, and DoD. Results from this workshop will support the further development of capabilities and analytical need roadmaps for the national security community. MORS looks forward to the continued collaboration between the participants as well as those organizations identified as resilience stakeholders who were unable to attend.

“Job Well Done!”

About the Authors
Dr. Simon R. Goerger is the ERDC Director of the Institute for Systems Engineering Research at the Information Technology Laboratory (ITL) of the US Army Engineer Research and Development Center (ERDC) in Vicksburg, Mississippi. He earned a bachelor of science from the United States Military Academy, a master of science in national security strategy from the National War College, and a master of science in computer science and a PhD in modeling and simulations from the Naval Postgraduate School. Simon has served the Society as a member of the MORS Board of Directors for nine of the last 10 years.

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Dr. Jennifer L. Schneider, is a professor and the Eugene H. Fram Chair for Applied Critical Thinking, and leads the Collaboratory for Resiliency & Recovery at the Rochester Institute of Technology. She earned a BA in comprehensive science from Roberts Wesleyan, an MS from the University of Rochester School of Medicine and Dentistry, and a doctorate from the University of Massachusetts Lowell College of Engineering. Prior to RIT, Dr. Schneider was in corporate Environmental, Health & Safety (RISK) for Kodak, Mobil, and ITT/Goulds. She served on the local HAZMAT team and comes from a family of first responders. Her research interests include risk and decision systems (MORS) and response, measurement, and management of resilience at the community/regional level.