

Assessing and Improving the Resilience of Operational Energy and Critical Infrastructure Systems

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With Dr. David Alderson

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Dr. David Alderson

Abstract:

In this talk, I will describe recent work in the NPS Center for Infrastructure Defense to assess and improve the operational resilience of critical energy infrastructure systems to either deliberate threats (e.g., attacks, sabotage, vandalism) or non-deliberate hazards (e.g., accidents, failures, natural disasters). We quantify operational resilience for an infrastructure system to a set of disruptive events in terms of degradation of system function. We show how to build and solve a sequence of models to assess and improve the resilience of an infrastructure system to those disruptions. Using notional examples and real applications to the military fuel supply chain the Pacific Theater, I will present insights and lessons learned.

Abridged Biography:

David Alderson is an Associate Professor in the Operations Research Department and serves as Director for the Center for Infrastructure Defense at the Naval Postgraduate School (NPS). He is also a member of the NPS Cyber Academic Group, which has academic oversight of interdisciplinary cyber curricula on campus.

Alderson's research focuses on the function and operation of critical infrastructures, with particular emphasis on how to invest limited resources to ensure efficient and resilient performance in the face of accidents, failures, natural disasters, or deliberate attacks. His research explores tradeoffs between efficiency, complexity, and fragility in a wide variety of public and private cyber-physical systems.

Alderson has been the Principal Investigator of sponsored research projects for the Navy, Army, Air Force, Marine Corps, and Coast Guard.

Dr. Alderson earned his doctorate from Stanford University and his undergraduate degree from Princeton University. He has held research positions at the California Institute of Technology (Caltech), the University of California Los Angeles, the Xerox Palo Alto Research Center (PARC), and the Santa Fe Institute. He has extensive industry experience, and has worked for several venture-backed startup companies. His early career was spent developing technology at Goldman Sachs & Co. in New York City.

