Dear participants,

We are honored and delighted to welcome you to the Second Annual Maritime Risk Symposium at Rutgers University. The networking, cooperation, interoperability and collaboration that came out of the first meeting at the University of Southern California last year provided a perfect foundation for this year's event. Building on that momentum we have developed a world class agenda, fortified by three truly national experts including retired CG Admiral Thad Allan whose bold leadership during Katrina and Deepwater Horizon incidents set a new standard for managing risk and consequence. Since his retirement Admiral Allan has continued the national discussion regarding risk, resilience and threats within the maritime environment.

Also joining us, Dr. Stephen Flynn, whose two books and countless congressional testimonies are considered some of the best national work regarding risk and resilience in the maritime environment. Finally, we welcome Coast Guard Rear Admiral Peter Neffenger who leads the Coast Guard Strategic Management Directorate and is the Senior Risk Executive of the Coast Guard. Admiral Neffenger also brings some of the finest tactical knowledge of the Coast Guard's operation and interoperability on risk issues with local, state, federal and industry partners. He has served as the Commander of Coast Guard District Nine (based on the Great Lakes) and as the Commanding Officer and Captain of The Port of Coast Guard Sector Los Angles Long Beach, the largest and busiest port complex in the country.

This year's symposium has brought together the finest from government, industry and academia to exchange ideas on the most critical aspects of understanding risks within the maritime transportation system. Mitigating risks and handling consequences have become ever more important as the world's nations expand their trade and explore new ways of transporting goods, as the arctic becomes more accessible, and as industries operate larger carriers resulting in higher vulnerabilities.

We have organized the program in such a way that speakers mostly from government and industry bring their arguments during the first two days and the researchers mostly from academia and the DHS Centers of Excellence share their research findings on the third day. Robert Ross, Captain, USCG (Ret.) and Chief, Risk Sciences Branch, Science and Technology Directorate at DHS will bring his years of experience in the field of risk analysis in his key note on the research day.

This year's symposium leadership team and our wonderful board of advisors implore you to network and get to know each other. Members from academia, let the practitioners know what you are working on. Participants from government and industry, let the academics know where your gaps and challenges are. We truly believe that the next three days offer a real opportunity to identify critical research problems and promote collaboration. Please make the most of it.

Finally, we would like to thank the U.S. Coast Guard Atlantic and Pacific Areas, the U.S. Coast Guard Research and Development Center, Rutgers' CCICADA, CAIT and DIMACS Center staffs for their nonstop support and the National Science Foundation for the funding they provided for this meeting.

Dr. Tayfur Altiok
Director, Laboratory for Port Security at CAIT
Professor, Industrial and Systems Engineering
Rutgers University

Dr. Joe DiRenzo III
Chief, Operations Analysis Division
LANTAREA (LANT-7)
USCG

Program Committee

Co-Directors:

Dr. Tayfur Altiok, Command, Control, and Interoperability Center for Advanced Data Analysis (CCICADA)/Laboratory for Port Security (LPS), CAIT, Rutgers University
Dr. Joe DiRenzo, Operations Analysis & Performance, United States Coast Guard (USCG)

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Mr. David Boyd, USCG
Mr. Bert Macesker, Research & Development, USCG

Steering Committee:

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Dr. James Boutilier, Maritime Forces Pacific (MARPAC), Canada
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Commander Bill Csisar, Atlantic Area, USCG
Mr. Matt Cutts, United States Army Corp. of Engineers (USACE)
Mr. Owen J. Doherty, Maritime Administration (MARAD), DOT
Capt. Linda Fagan, Sector New York, USCG
Ms. Adele Fasano, U.S. Customs and Border Protection (USCBP)
Dr. David Ebert, Visual Analytics for Command, Control, and Interoperability Environments (VACCINE), Purdue University
Dr. Margo Edwards, National Center for Island, Maritime, and Extreme Environment Security (CIMES), University of Hawaii
Dr. Michael Greenberg, COENTS, Rutgers University
Dr Rick Luettich, Institute of Marine Sciences, University of North Carolina at Chapel Hill (UNC-CH)
Dr. Isaac Maya, National Center for Risk and Economic Analysis of Terrorism Events (CREATE), University of Southern California (USC)
Dr. Allen Miller, Department of Homeland Security (DHS)
Capt. David Moskoff, U.S. Merchant Marine Academy
Mr. Richard Nelson, Center for Strategic and International Studies (CSIS)
Mr. Clifford Oliver, State Emergency Service (SES), FEMA
Mr. Joe Picciano, New Jersey Office of Homeland Security and Preparedness
Mr. Neil Piper, Australian Border Protection Command
Dr. Fred Roberts, CCICADA, Rutgers University
Mr. Jeffrey Robertson, Homeland Security Institute (HSI), DHS
Dr. Adam Rose, National Center for Risk and Economic Analysis of Terrorism Events (CREATE), University of Southern California (USC)
Dr. Scott Savitz, HSI, DHS
Capt. Craig Swirbliss, USCG Headquarters
Dr. Henry Willis, RAND Corporation

Agenda

DAY 1 • November 7, 2011	
7:00–8:00 a.m.	Continental breakfast, registration, and badge pickup
7:45 a.m.	Arrival of USCG Air Station Atlantic City MH-65 helicopter for static display
8:00–8:15 a.m.	Opening Remarks by conference directors and directors of CCICADA/DIMACS and CAIT
8:15–8:30 a.m.	Opening Remarks by Rutgers President Richard L. McCormick
8:30–9:15 a.m.	Keynote Address: Admiral Thad Allen, Former Commandant, U.S. Coast Guard (Ret.), RAND Corporation
9:15–10:30 a.m.	Panel: Risk Assessment and Policy: Government Perspectives I Moderator: Rick "Ozzie" Nelson, Director, Center for Strategic and International Studies (CSIS) Owen Doherty, Director of Office of Security, Maritime Administration (MARAD), U.S. Department of Transportation (DOT) Frank Wood, Strategic Risk Advisor, USCG (Risk Governance) Charles B. McKenna, Director, New Jersey Office of Homeland Security & Preparedness (State Government View)
10:30–10:45 a.m.	Break
10:45 a.m.–12:00 p.m.	Panel: Risk vs. Business Requirements: Industry Perspectives I Moderator: Michael Greenberg, Associate Dean, Edward. J. Bloustein School of Planning and Public Policy, Rutgers University Steven Weiss, Vice President, Liberty International Underwriters, Houston, Texas Rodolfo Sabonge, Vice President of Market Research, Panama Canal Authority, Panama Capt. James DeSimone, Chief Operations Officer, Staten Island Ferry, New York City
12:00–1:30 p.m.	Lunch Speaker: Admiral Peter Neffenger, U.S. Coast Guard
1:30–3:00 p.m.	Panel: Public-Private Partnerships I Moderator: David Boyd, Command, Control & Interoperability Division, USCG Bethann Rooney, Manager of Port Security, Port Authority of New York and New Jersey (PANYNJ) Capt. Meredith Austin, Captain of the Port (COTP) Sector Delaware Bay, USCG Michael Buckheit, Fire Department of the City of New York (FDNY)
3:00–3:30 p.m.	Break
3:30–5:00 p.m.	Panel: Public-Private Partnership II–Piracy Moderator: Jeffrey Robertson, Vice President, Adfero Group Capt. David Moskoff, Recent Assistant Academic Dean, U.S. Merchant Marine Academy Kim Hall, Analyst, HSI, DHS Charles Dragonette, Piracy Expert, U.S. Office of Naval Intelligence (ONI)
6:00 p.m.	Evening Reception: Zimmerli Art Museum, Rutgers University
DAY 2 • November 8, 2011	
8:30–9:15 a.m.	Plenary Talk: Stephen Flynn, President, Center for National Policy (CNP)
9:15–10:30 a.m.	Risk Assessment and Policy Making: Government Perspectives II Moderator: Bert Macesker, Executive Director, USCG Research and Development (R&D) Center Adele Fasano, Area Director, United States Customs and Border Protection (CBP) Capt. Linda Fagan, COTP Sector New York, USCG Michele Siekerka, Assistant Commissioner, New Jersey Department of Environmental Protection (NJDEP)
10:30–10:45 a.m.	Break

10:45 a.m.–12:00 p.m.	Risk vs Business Requirements: Industry Perspectives II Moderator: Isaac Maya, Director of Research, National Center for Risk and Economic Analysis of Terrorism Events (CREATE), University of Southern California (USC) Dave Newton, USCG (Ret.), Science and Technology Directorate, DHS Rob Gibbs, Development Manager, PSE&G (Off Shore Wind Farms) RADM Gene Brooks, USCG (Ret.), Technical Organization Senior Director, Maersk Line Limited
12:00–1:30 p.m.	Luncheon Speaker: Laurence Smallman, RAND Corporation
1:30–3:00 p.m.	Panel: International Perspectives Moderator: William Watson, Deputy Commissioner of Maritime Affairs, Republic of the Marshall Islands Steve O'Malley, International Organization for Standardization (ISO) TC-8 Coordinator, Ship & Supply Chain Security and Resiliency Standards Ken Hansen, Research Fellow, Dalhousie University, Canada Lt. Cmdr. Mark Sawyer, USCG liaison to World Maritime University, Sweden
3:00–3:30 p.m.	Break
3:30–5:00 p.m.	Panel: Role of Intelligence Moderator: Capt. David Moskoff, Recent Assistant Academic Dean, U.S. Merchant Marine Academy Michael Harpster, Assistant Special Agent in Charge, Federal Bureau of Investigation (FBI), Newark, NJ Office Charles Dragonette, Piracy Expert, U.S. Office of Naval Intelligence (ONI) William Watson, Deputy Commissioner of Maritime Affairs, Republic of the Marshall Islands
DAY 3 • November 9, 2011 (Research Day)	
8:20–8:30 a.m.	Welcoming Remarks by CCICADA Director Fred Roberts
8:30–9:00 a.m.	Keynote Address: Research and Education Challenges in Risk Analysis and Risk Management, Robert G. Ross, Captain, USCG (Ret.), Chief, Risk Sciences Branch, Science and Technology Directorate, DHS
Resource Allocation	
9:00–9:20 a.m.	Risk-Based Visual Analytics for Maritime Resource Allocation David Ebert, Director, Visual Analytics for Command, Control, and Interoperability Environments (VACCINE), Purdue University
9:20–9:40 a.m.	ARMOR-PROTECT: An Application of Game Theory to the USCG's Ports, Waterways and Coastal Security (PWCS) Mission Milind Tambe, Professor, CREATE, USC Bo An, Postdoctoral Research Associate, CREATE, USC Eric Shieh, PhD Candidate, CREATE, USC
9:40–10:00 a.m.	PortSec: Port Security Resource Allocation and Cost-Benefit Analysis Michael Orosz, Professor, CREATE, USC Isaac Maya, Director of Research, CREATE, USC
10:00 a.m.–10:20 a.m.	Sonar Placement in Ports and Waterways Amir Ghafoori, Ph.D. Student, CCICADA Tayfur Altiok, Professor, Rutgers' CAIT
10:20–10:40 a.m.	Break
Resilience	
10:40–11:00 a.m.	Resilience Modeling in Preparedness Planning in Port Security Brian Sauser, Assistant Professor, The Center for Secure and Resilient Maritime Commerce (CSR), Stevens Institute of Technology Jose Ramirez-Marquez, Associate Professor, CSR, Stevens Institute of Technology

11:00–11:20 a.m.	Resilience Modeling for Post Disaster Recovery of Interdependent Industries and Infrastructures: Application to Inland Port Disasters Raghav Pant, Graduate Research Assistant, School of Industrial Engineering, University of Oklahoma Kash Barker, Assistant Professor, School of Industrial Engineering, University of Oklahoma Thomas L. Landers, Dean, School of Industrial Engineering, University of Oklahoma
11:20–11:40 a.m.	Supporting Secure and Resilient Inland Waterways Heather Nachtmann, Associate Professor, College of Engineering, University of Arkansas Justin R. Chimka, Associate Professor, College of Engineering, University of Arkansas Edward A. Pohl, Associate Professor, College of Engineering, University of Arkansas Tish "L.M." Pohl, Research Associate, College of Engineering, University of Arkansas Henry J. Mayer, Executive Director, Edward J. Bloustein School of Planning & Public Policy, Rutgers University Jennifer Rovito, GIS Specialist, Edward J. Bloustein School of Planning & Public Policy, Rutgers University
11:40 a.m.–12:00 p.m.	Algorithmic Decision Theory and the Port Reopening Scheduling Problem Fred Roberts, Director, CCICADA
12:00–1:40 p.m.	Lunch
Risk and Economic Analysis	
1:40–2:00 p.m.	Interdependent, Multi-regional Impacts of Inoperability at Inland Waterway Ports Kash Barker, Assistant Professor, School of Industrial Engineering, University of Oklahoma Raghav Pant, Graduate Research Assistant, School of Industrial Engineering, University of Oklahoma Hiba Baroud, Graduate Research Assistant, School of Industrial Engineering, University of Oklahoma Thomas L. Landers, Dean, School of Industrial Engineering, University of Oklahoma
2:00–2:20 p.m.	A Next-Generation Integrated Sensor and Data Fusion System for Force Health Protection and Homeland Security Kevin Montgomery, Lead Investigator, Center for Island, Maritime, and Extreme Environment Security (CIMES), University of Hawaii
2:20–2:40 p.m.	Quantitative Assessment of Supply Chain Risks Iris Heckmann, Research Scientist, Karlsruhe University, Germany
2:40 p.m.–3:00 p.m.	Measuring Economic Risk Benefits of USCG Marine Safety Programs Adam Rose, Acting Director, Energy Institute, CREATE, USC Dan Wei, Research Assistant Professor, CREATE, USC
3:00–3:20 p.m.	Break
Risk Analysis: Ports and Waterways	
3:20–3:40 p.m.	Adversarial Risk Analysis: The Somali Pirates Case Jesus Rios, IBM T.J. Watson Research Center, USA David Rios Insua, Royal Academy of Sciences, Spain Juan Carlos Sevillano, Complutense University, Spain
3:40–4:00 p.m.	Maritime Traffic Modeling for Risk Assessment and Response Planning Ronald Pelot, Professor, Maritime Activity and Risk Investigation Network (MARIN), Dalhousie University Casey "R.C." Hilliard, Research Associate, MARIN, Dalhousie University
4:00–4:20 p.m.	U.S. Port Operational Risks and the Call for Port Resilience James Rice, Deputy Director, Center for Transportation and Logistics (CTL), Massachusetts Institute of Technology
4:20–4:40 p.m.	Risk Analysis of the Maritime Traffic in Delaware River Alper Almaz, Ph.D. Student, CCICADA Tayfur Altiok, Professor, CAIT, Rutgers University

Biographies

Keynote Address

Admiral Thad Allan

RAND Corporation

ADMIRAL ALLEN joined RAND as a Senior Fellow on October 4, 2010, after more than 39 years of service with the United States Coast Guard. Allen completed his distinguished Coast Guard career as its 23rd Commandant, retiring from that position in June 2010.

On May 1, 2010, President Barack Obama selected Admiral Allen to serve as the National Incident Commander for the unified response to the Deepwater Horizon oil spill in the Gulf of Mexico—a position he held concurrently while finishing his tenure as Commandant of the Coast Guard. In that position, Allen was charged with oversight of all response efforts to cease the flow of oil and mitigate the effects of the worst oil disaster in U.S. history. Working closely with the federal on-scene coordinator, the U.S. Environmental Protection Agency, and the U.S. Departments of Homeland Security, Defense, Interior, Commerce, and Health and Human Services, he sought to bring a global unity of effort to response endeavors. Allen was also in charge of coordinating with various state and local entities, as well as directing the efforts of BP, the responsible party in the spill.

Prior to his assignment as Commandant, Allen served as Coast Guard Chief of Staff. During his tenure in that position, in 2005, he was designated Principal Federal Official for the U.S. government's response and recovery operations in the aftermath of Hurricanes Katrina and Rita throughout the Gulf Coast region.

Other Coast Guard assignments included Commander, Atlantic Area and Maritime Defense Zone Atlantic—where in 2001 he led the Coast Guard's Atlantic Area forces following the September 11 attacks. He previously served as Commander, Seventh Coast Guard District, where he oversaw all operations in the southeastern United States and in the Caribbean.

His numerous awards and decorations include the Homeland Security Distinguished Service Medal with gold star, the Defense Distinguished Service Medal, the Coast Guard Distinguished Service Medal with two gold stars, and the Legion of Merit.

Allen is a native of Tucson, Arizona. He is a 1971 graduate of the U.S. Coast Guard Academy. He holds a Masters in Public Administration from The George Washington University—from which he received the Alumni Achievement Award in 2006. He also holds a Master of Science in Management from the Sloan School of Management at the Massachusetts Institute of Technology. He was elected a National Academy of Public Administration Fellow in 2003.

Rick "Ozzie" Nelson

Senior Fellow and Director, Homeland Security and Counterterrorism Program
Center for Strategic and International Studies

MR. NELSON is a former Navy helicopter pilot with over twenty years operational and intelligence experience, including assignments at the National Security Council and the National Counterterrorism Center. He is a senior fellow in the CSIS International Security Program, where he focuses on counterterrorism, homeland security, maritime operations and strategy and defense-related issues.

He joined CSIS in September 2009, after retiring from the U.S. Navy, where he served in a variety of senior policy and operational positions including service in Afghanistan. His last military assignment was with the Joint Special Operations Command. In 2005, he was selected to serve as an inaugural member in the National Counterterrorism Center's (NCTC) Directorate of Strategic Operational Planning. Prior to his assignment at NCTC, Nelson served as associate director for maritime security in the Office of Combating Terrorism on the National Security Council staff at the White House, where he led the development of the National Strategy for Maritime Security.

Other career assignments have included counterterrorism team leader in Deep Blue, the navy's operational think tank created after September 11; navy legislative fellow for Senator Edward M. Kennedy; assistant aviation officer community manager; and flag aide in Okinawa, Japan, to the commander of naval amphibious forces in the Western Pacific.

He is operationally trained in naval helicopter strike warfare in the SH-60B Seahawk and SH-2F Seasprite helicopters, and he has deployed around the world and flown in support of numerous operations.

Nelson graduated from the George Washington University with a B.A. in political science, holds an M.A. in national security studies from Georgetown University, and is a graduate of the Naval War College. He is an adjunct lecturer at Georgetown University, where he teaches courses on homeland security and counterterrorism, and a Council on Foreign Relations Life Member. He is also a frequent contributor to many media outlets, including the New York Times, Washington Post, NPR, CBS, CNN, NBC, and ABC, among others.

Owen J. Doherty

Director, Office of Security
Maritime Administration

MR. DOHERTY assumed duties as Director for the Office of Security in May 2007, after serving for 3 years as Special Assistant to the Maritime Administrator. As Director, he is responsible for central coordination of all activities regarding maritime security including policy development, technology implementation, and operations.

Prior to transferring to the Maritime Administration (MARAD) Headquarters in 2004, he served as the MARAD Liaison Officer to the United States Transportation Command at Scott Air Force Base, Illinois. During his eighteen years with MARAD, he worked extensively with the Ready Reserve Force vessels and National Security programs.

After graduating from the United States Merchant Marine Academy in 1981, he sailed as an Engineering Officer on United States Naval Ships for Military Sealift Command after which he worked as a Port Engineer both in Oakland, CA and Honolulu, HI. He was promoted to be the Engineering Director for the MSC office in Naples, Italy during which time he was temporarily assigned to Bahrain in support of Desert Shield/Desert Storm.

Mr. Doherty is a Captain in the United State Navy Reserves and received a Master of Arts degree in National Security and Strategic Studies from the Naval War College in 1995.

Mr. Frank Wood

Strategic Risk Advisor
United States Coast Guard

MR. WOOD is Strategic Risk Advisor in the Strategic Management Directorate in USCG Headquarters. He is an expert on risk and performance management and is the primary sponsor for business initiatives that include risk-informed performance management, process and activity based management and costing, predictive business intelligence, organizational alignment, and development of decision support systems.

Mr. Wood has been a guest lecturer on activity based management and costing at the National Defense University, Information Resource Management College, in Washington, DC. He has had several articles on risk management published in professional journals. He earned a Bachelor's Degree in Liberal Arts from the University of Illinois, a Masters Degree in Business Administration from Texas A&M University and attended the Federal Executive Institute in Charlottesville, VA. He also is a retired Navy diving officer.

Mr. Charles McKenna

Director
New Jersey State Office of Homeland Security and Preparedness

MR. MCKENNA was appointed Director of the New Jersey State Office of Homeland Security and Preparedness on January 6, 2010, by then governor-elect Chris Christie and took office on January 19, 2010.

Mr. McKenna came to this position from the United States Attorney's Office, District of New Jersey, where he had served for 18 years. At the time of his appointment, he was the Chief of the Criminal Division, a position in which he directed attorneys responsible with prosecuting federal criminal violations since 2008. He also supervised investigations and interacted with heads of law enforcement—including the Federal Bureau of Investigation, Drug Enforcement Agency, Internal Revenue Service and Department of Defense and was responsible for establishing and administering policy for the Criminal Division, the largest in the U.S. Attorney's Office.

From 2002 until 2008, Mr. McKenna served as Executive Assistant U.S. Attorney under then U.S. Attorney Chris Christie. Here, he had executive oversight for all Criminal and Civil Division investigations as well as administrative responsibilities to ensure efficient operations in the office. He also represented the office on many occasions to law enforcement and private industry groups, lecturing on various aspects of criminal law.

As an Assistant U.S. Attorney, Mr. McKenna successfully prosecuted many cases involving violations of federal criminal laws. He was involved in the investigation into the kidnapping and murder of Daniel Pearl, the Southeast Asia Bureau Chief for the Wall Street Journal, and he successfully prosecuted animal rights extremists. In 2002, he was a recipient of a Director's Award for Superior Performance from the U.S. Department of Justice.

From 1999 to 2002, Mr. McKenna was the U.S. Attorney's Office Liaison to the FBI Joint Terrorism Task Force. From 2002 until leaving the U.S. Attorney's Office, he was the Crisis Management Coordinator for the District of New Jersey.

Mr. McKenna received a J.D. in 1986 from St. John's University School of Law, where he graduated magna cum laude. He was awarded a Bachelor of Arts summa cum laude in 1982 from Fordham University.

Dr. Michael Greenberg

Associate Dean
Edward J. Bloustein School of Planning and Public Policy; Rutgers University

DR. GREENBERG is professor and director of the National Center for Neighborhood and Brownfields Redevelopment of Rutgers University; director of the U.S. DHS-funded Center for Transportation Safety, Security and Risk at Rutgers University; and associate dean of the faculty of the Edward J. Bloustein School of Planning and Public Policy.

His books include *Urbanization and Cancer Mortality (1983), Hazardous Waste Sites: the Credibility Gap (1984), Public Health and the Environment (1987), Environmental Risk and the Press (1987), Environmentally Devastated Neighborhoods in the United States (1996), Restoring America's Neighborhoods: What Local People Can Do (1999), the Reporter's Environmental Handbook (2003), Environmental Policy Analysis & Practice (2008),* and *Reporter's Handbook on Nuclear Materials, Energy, and Waste Management*

(2009). In addition to more than 25 books, professor Greenberg has contributed more than 300 articles and 40 editorials to social science and policy journals and has written more than 200 technical reports.

He has been a member of National Research Council Committees that focus on the destruction of the U.S. chemical weapons stockpile and nuclear weapons; chemical waste management; and the degradation of the U.S. government physical infrastructure. He has received awards for research from the United States Environmental Protection Agency, the Society for Professional Journalists, the Public Health Association, the Association of American Geographers, and Society for Risk Analysis. He serves as associate editor for environmental health for the *American Journal of Public Health*, and is editor-in-chief of *Risk Analysis: An International Journal*.

Steven P. Weiss, CPCU, AMIM, NAMS-CMS

Vice President
Liberty International Underwriters

In his role as Vice President at Liberty International Underwriters, MR. WEISS is responsible for Marine Risk Engineering, Project Cargo Underwriting and all lines marine for Latin America. In this role he provides Marine Risk Engineering, Management and project cargo underwriting services in support of the North and South American Marine operation.

A graduate of Virginia Military Institute, Mr. Weiss' background includes 20 years as a Marine Surveyor, Loss Adjuster and Underwriter and 5 years prior service with the U.S. Navy as a deck officer.

He specializes in Project cargo (infrastructure projects) with Delay in Start-up. He also helped develop and implement the "Quality Operator" initiative for Marine Liability exposures. The Marine Risk Engineering group he leads provides cutting edge solutions for unique risks in the dynamic world of Marine Insurance.

Acknowledged as an expert, Steven has consulted as an expert witness on many aspects of Marine transportation and liability claims and coordinated difficult logistical projects ensuring successful outcomes in complicated and difficult situations.

Prior to joining Liberty, Steven owned a Marine and Energy Surveying and Adjusting company in Houston.

Mr. Rodolfo Sabonge

Vice President of Market Research and Analysis
Panama Canal Authority

MR. SABONGE is the Vice President of Market Research and Analysis of the Panama Canal Authority. He holds a Bachelor of Science degree in Mechanical Engineering from the University of Notre Dame, a Master in Maritime Development from the School of Law from the University of Panama, and graduate studies in Business Administration from the University of Miami, Florida. He completed executive programs on Strategy—Building and Sustaining Competitive Advantage, from the Harvard Business School, on Strategic Planning and Implementation from Stanford University in a joint program with the University of Singapore, and on Port Planning and Management at the National Institute of Ports and Waterways of George Washington University.

He has been with the Panama Canal since 1986. Until 1993, he held several positions in Canal operations and later he was transferred to the Office of Executive Planning where he lead the Office of Transition

Planning, responsible for coordinating all actions necessary to ensure the orderly and successful transfer of the Panama Canal to the Republic of Panama. In 1999, he was appointed Director of Marketing and Corporate Planning. Currently, as Vice President of Market Research and Analysis, he is responsible for competitive intelligence, Canal pricing, and customer relations. Since 1993, he has participated in the development and implementation of Panama´s Maritime Strategy.

Before joining the Panama Canal, Mr. Sabonge worked in the electronics industry in the United States for four years. He also held the position of General Manager of the Panama Railroad. He later worked as assistant to the president for Panama's largest cement and concrete products manufacturer. Mr. Sabonge has also been a professor of post-graduate studies at two private universities in Panama.

Mr. Sabonge is a member of several committees of the U.S. Transportation Research Board, and represents the Canal in several international organizations, such as the American Association of Ports Authorities, the International Association of Ports and Harbors, and is a regular speaker at the University of Denver's Intermodal Transportation Institute in Colorado and many other maritime and transportation organizations worldwide.

James C. DeSimone

Commissioner for Ferries & Chief Operating Officer of the Staten Island Ferry
New York City Department of Transportation

CAPTAIN DESIMONE is employed by the New York City Department of Transportation ("NYCDOT") as Deputy Commissioner for Ferries & Chief Operating Officer of the Staten Island Ferry.

Prior to joining NYCDOT, Captain DeSimone held senior management positions in the high-speed ferry and towing and transportation sectors of the maritime industry, and served on the administration of our nation's oldest maritime academy. During his seagoing career, he sailed in all shipboard capacities up to and including master.

Captain DeSimone holds a Master of Business Administration from Manhattan College, a Bachelor of Science from the State University of New York Maritime College, a Professional Certificate in Chartering from the Association of Shipbrokers and Agents and a United States Coast Guard License as Master of Steam or Motor Vessels of Any Gross Tons upon Oceans.

Professional membership includes: the American Bureau of Shipping, Propeller Club Port of New York and New Jersey, Connecticut Maritime Association, Executive Steering Committee of the Area Maritime Security Committee, Advisory Boards of the Urban Assembly New York Harbor School and Kingsborough Community College Marine Technology Program, and the Standing Committee of the Marine Society of the City of New York.

Lunch Speaker (Day 1)

Rear Admiral Peter V. Neffenger

Director of CG Enterprise Strategic Management & Doctorine
United States Coast Guard

REAR ADMIRAL NEFFENGER is the Director of Strategic Management and Doctrine for the United States Coast Guard and most recently served as the Deputy National Incident Commander for the Deepwater Horizon Oil Spill—the largest and most complex oil spill in the nation's history.

Previous to this, he served as Commander of the Ninth Coast Guard District from May 2008 to April 2010. In this capacity, he led nearly 7,000 Coast Guard active duty, reserve, civilian, and auxiliary men and women serving throughout the five Great Lakes and the Saint Lawrence Seaway.

A native of Elyria, Ohio, Rear Admiral Neffenger was commissioned in 1982 at Coast Guard Officer Candidate School in Yorktown, Virginia. He has had a diverse career of operational and staff assignments across the spectrum of Coast Guard missions. Notable among these, he was Captain of the Port, Federal Maritime Security Coordinator and Commander of Coast Guard Sector Los Angeles—Long Beach, California; he served as engineer on U.S. Coast Guard Cutter GALLATIN (WHEC721); he was the Coast Guard Liaison Officer to the Territory of American Samoa, he served two years as a Coast Guard Fellow on the U.S. Senate Appropriations Committee; and was Chief of the Office of Budget and Programs at Coast Guard Headquarters, Washington, DC, where he was the principal budget advisor to the Commandant of the Coast Guard.

Rear Admiral Neffenger has earned three Master's degrees: in National Security and Strategic Studies from the Naval War College, Newport, Rhode Island; in Public Administration from Harvard University, Kennedy School of Government; and in Business Management from Central Michigan University. He holds a Bachelor of Arts degree from Baldwin-Wallace College, Berea, Ohio.

Rear Admiral Neffenger has received numerous military and civic awards, including recognition by the Coast Guard Foundation for his accomplishments in American Samoa and by the Department of Justice for his assistance in prosecuting environmental crimes in Northern California.

Mr. David Boyd

Lead Analyst—Operations Analysis Division
United States Coast Guard

MR. BOYD serves the U.S. Coast Guard, Pacific Area, as the lead analyst in the Operations Analysis Division. He has a MS in Public Administration (California State University, East Bay) and a BS in Mathematics (U.S. Coast Guard Academy). Mr. Boyd has over 30 years of combined military and civil service in the U.S. Coast Guard.

Ms. Bethann Rooney

Manager, Port Security
Port Authority of New York and New Jersey

MS. ROONEY currently serves as the Manager, Port Security for the Port Authority of New York and New Jersey. Assuming this post in the immediate aftermath of the 9/11 tragedy, Ms. Rooney has become a recognized world leader in maritime security issues. She implemented and manages a comprehensive security program in the nation's most visible and highest risk port. Her measures to avoid or minimize losses associated with natural or manmade disruptions have become a model for other ports. She has developed and cemented close working relationships with local stakeholders and federal, state and local law enforcement agencies to address awareness, prevention, protection, response, recovery, and resiliency efforts. Ms. Rooney managed the Port's participation in Operation Safe Commerce, a three year joint government-industry effort to study supply chain security. She drafted proposals that resulted in multiple port security grants valued at over $30 million to enhance the Port's security infrastructure. Ms. Rooney is the Chair of the Area Maritime Security Committee for the Port of New York and New Jersey and a member of the National Maritime Security Advisory Committee (NMSAC). She is a past member of the Commercial Operators Advisory Committee (COAC). Ms. Rooney founded and serves as Chair of the Port Security Caucus and sits on the Security Committee of the American Association of Port Authorities (AAPA). Actively involved in the legislative and regulatory processes, she has routinely been called upon to testify before Congress regarding port and maritime security.

Prior to her current post, Ms. Rooney held several positions in the Port Commerce Department of the Port Authority including stints in Operations, Property Management, Intermodal and Technology Planning. She evaluated and implemented Intelligent Transportation System (ITS) technologies to improve the movement of intermodal freight and commercial vehicle operations. She obtained federal and state grants in excess of $12 million for the implementation of a new trans-harbor freight service. As property manager, she negotiated lease terms for intermodal tenants including terminal operators, warehouses, and trucking companies for accounts in excess of $7 million annually.

In addition to her extensive service with the Port Authority, Ms. Rooney has worked as a steamship agent in several deep-water ports. While serving in Operations for the General Steamship Corporation, she regularly worked and attended vessels in both the wet and dry trades at all East Coast ports between Portland, Maine and Norfolk, Virginia as well as Tampa and New Orleans. She routinely coordinated operations with government agencies, tugboats, pilots, and suppliers and performed oversight of cargo operations, personnel issues, and emergency response protocols.

Ms. Rooney is a graduate of the State University of New York Maritime College with a Masters Degree in International Transportation Management and a Bachelors Degree in Marine Transportation. She holds qualifications as a Third Mate and several professional certifications.

Captain Meredith Austin

Commander, Coast Guard Sector Delaware Bay
United States Coast Guard

CAPT AUSTIN has held a variety of positions in the Marine Safety, Security and Stewardship mission areas of the Coast Guard. She received a Bachelor of Science degree in Marine Science from the Coast Guard Academy, a Master of Science in Public Health in Industrial Hygiene from the University of North Carolina-Chapel Hill and a Master of Arts in Homeland Security from the Naval Postgraduate School in Monterey, California.

She has served at a variety of Coast Guard units including the icebreaker USCGC POLAR SEA, two Marine Safety Offices and several staff assignments in pollution response. She was the Commanding Officer of the Pacific Strike Team where she responded to the World Trade Center disaster, and was the Commander of the National Strike Force Coordination Center during the response to Hurricane Katrina. As the first Planning Officer for the Deployable Operations Group CAPT Austin strengthened interagency bonds between the Coast Guard and other DHS components, FBI and DOD.

CAPT Austin is a Certified Type I Coast Guard Incident Commander and Certified Industrial Hygienist and spent three months as an Incident Commander for the Deepwater Horizon oil spill response. CAPT Austin assumed command of Coast Guard Sector Delaware Bay in June 2009 responsible for Search and Rescue, Ports, Waterways and Coastal Security, Aids to Navigation, Maritime Law Enforcement, Pollution Response, Commercial Vessel Safety and Icebreaking for the Delaware River from the mouth of the river up to Trenton, NJ, the eastern two-thirds of Pennsylvania, the NJ coast from Shark River down to Cape May and out 200 miles from the coast, and all of Delaware.

Michael J. Buckheit, Battalion Chief

FDNY Marine Battalion Commander
FDNY Marine Operations

In his role as Marine Battalion Commander, MR. BUCKHEIT is one of the Chief's responsible to oversee all Marine related responses and daily operations within FDNY Marine Operations. Previously, Mr. Buckheit worked at Shoreham Nuclear Power Station with the armed security force and later Brookhaven National Laboratory Police with one core responsibility being to protect the HFBR (High Flux Beam Reactor).

A member of FDNY since 1988, his previous assignments included Firefighter to Engine 72 (Bronx), Ladder 19 (South Bronx); promoted to Lieutenant in 1998 and assigned to Engine 37 (Harlem). He was promoted to Captain in 2003 and assigned to Engine 63 (Da' Bronx). It was during this time, post 9-11, that Mike was selected to attend the first ever collaborative effort between the West Point Military Academy and the FDNY, a focus group on Counter Terrorism. As Battalion Chief in 2007, Mr. Buckheit received assignment to FDNY Marine Operations under the Command of the Chief of Marine Operations James Dalton.

Mr. Buckheit has operated at multiple Marine related incidents that include U.S. Air Flight 1549, the CSL Atlas (Coal ship fire), the MV Polarlight (Refrigerated ship fire), the Sichem Defiance (Chemical tanker over pressure explosion) Marina Fire NJ (Weehawken) and recently the vessel King Hakan (Mutual Aid to Connecticut for fire on a coal ship).

Mr. Buckheit is a member of several USCG Area Maritime Security Committees, Secure the Cities Maritime representative for FDNY, one of the contributors to the recently released FDNY Marine Operations Strategic Plan, and a collaborative effort between Harvard Business School and FDNY.

In recent years FDNY Marine Operations has undergone a metamorphosis to include a new fleet, requiring the Chiefs in Marine Operations to provide input and be project managers for the build process, as well as construction projects to support the infrastructure for these new vessels and capabilities.

Port Partnership has, and continues to be, a major factor in the overall success of our Port. The USCG has taken a lead role and managed to bring multiple agencies to the "table" while leveraging Port Security grant monies to reduce the "risk" to the economic engine that is the Port of NY/NJ.

Mr. Jeffrey Robertson

Vice President
Adfero Group

Since 2011**,** MR. ROBERTSON has served as Vice President for the Adfero Group—a full service public relations and strategic communication firm in Washington, DC, focused on their public sector practice. Mr. Robertson has an extensive background and experience with the Department of Homeland Security, the Intelligence Community, and commercial media. Specifically, he is an expert in crisis communication, media and government relations, maritime security, and business development.

His federal career has focused on maritime and border security issues. He has more than 27 years of experience with the U.S. Coast Guard and U.S. Customs and Border Protection, serving in operations, intelligence, and public affairs roles.

From 2007–2009, Robertson served as the Assistant Commissioner of Public Affairs for U.S. Customs and Border Protection, an agency of the Department of Homeland Security. In this position, he served as the principal communications executive for the federal law enforcement agency, leading day-to-day and strategic communication for CBP's portfolio of responsibilities, which includes the Border Patrol, Field Operations, Air and Marine Operations, and Trade regulation. He retired from the U.S. Coast Guard in 2005.

Prior to joining the Adfero Group, he served as the Outreach Director for the Homeland Security Studies and Analysis Institute (HSI). HSI is a federally funded research and development center (FFRDC) established to provide independent studies and analysis on homeland security issues for DHS and other government entities within the homeland security enterprise.

He currently serves on the Board of Visitors for the Nicholson School of Communication at the University of Central Florida, on several maritime and border security advisory panels and working groups, and provides pro-bono communication support to small non-profit organizations. Robertson has served in industry as a consultant, Outreach Director, and Communication Director.

A native of Bassett, Virginia, Robertson is a graduate of the U.S. Coast Guard Academy with a Bachelor's Degree in Government, holds a Master's of Science in Strategic Intelligence from the National Military Intelligence College, and is a graduate of the Defense Information School.

Captain David Moskoff, USMS

Assistant Dean and Professor, Marine Transportation Department
United States Merchant Marine Academy

CAPT MOSKOFF is in the Marine Transportation Department at the United States Merchant Marine Academy. He is also currently teaching Bridge Resource Management (the capstone simulation course) and has been the Lead Instructor in Electronic Navigation since 2002. He was recently Faculty Forum President and is now the Chair of the STCW Council which necessitates he be the USMMA POC for the USCG/NMC. He is also the POC for the DOD's Defense Threat Reduction Agency (DTRA), often providing midshipmen Independent Study focused in related Maritime Security and Counter-Terrorism venues. He is especially engaged in Maritime Security sectors and activities having specialties in areas such as: Port Safety and Law Enforcement Activities, IT(Information Technology) Assessment & Cyber Defense; Threat Assessment, Counter Terrorism and Marine Piracy; Marine Simulation and Bridge Resource Management; Electronic Navigation; Contingency Planning; Tankers & Gas Carriers; Marine Firefighting, Mooring, Shiphandling, Single Point & Offshore Moorings; Automatic Identification Systems(AIS), Maritime Distress Communications, Search & Rescue and Vessel Traffic Systems.

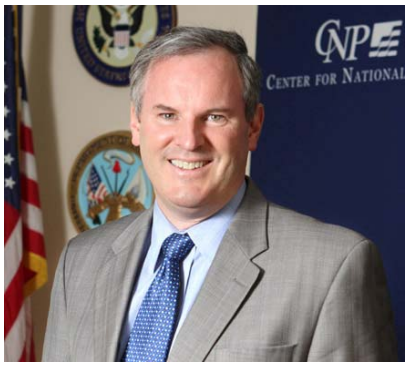
CAPT Moskoff is also President of MARITECH, a marine consulting and services firm entering its third decade of service to the marine industry. He has been certified as an American Bureau of Shipping (ABS) ISO/ISM third party external auditor as well as a certified third party auditor for the American Waterways Operators' Responsible Carrier Program. He holds a current USCG Unlimited Master's License and has commanded both steam and diesel ships during his many years at sea. CAPT Moskoff has particularly strong experience aboard tankers and gas carriers.

Ms. Kim Hall

Analyst, Policy Analysis Division
Homeland Security Studies and Analysis Institute (HSI)

MS. HALL is an analyst in the Policy Analysis Division at the Homeland Security Studies and Analysis Institute (HSI). She joined the Institute in November 2010 from the Center for Naval Analyses (CNA) where she was a research analyst in the Strategic Initiatives Group focusing on threats and issues pertaining to the global commons. She specializes in maritime safety and security with a concentration in maritime piracy and armed robbery. Her research interests also include: U.S. maritime policy (national and international); and U.S. Navy/Coast Guard operations and international outreach; and littoral nation politics and foreign policy. During her time at CNA, Kim was the CNA field representative to U.S. Naval Forces Central Command (NAVCENT), U.S. Fifth Fleet, and the Combined Maritime Forces in Manama, Bahrain. While there her analytical focus included counter-piracy operations, critical maritime infrastructure protection, and regional stability as it impacted U.S. Navy and coalition operations in the NAVCENT area of responsibility. Kim received a BA in political science and communications, law, economics, and government (CLEG) from American University and an MPhil in international relations from University of Cambridge (UK).

Plenary Talk (Day 2)



Dr. Stephen Flynn

President
Center for National Policy

In January 2010, Dr. Stephen Flynn became the sixth President of the Center for National Policy, founded in 1981. He has focused the work of the Center on informing and advancing societal and infrastructure resilience and is leading the effort to organize a Summit that will be the main event in Washington, DC to mark the Tenth Anniversary of the 9/11 Attacks. Prior to being selected to lead the Center, he spent a decade as a senior fellow for National Security Studies at the Council on Foreign Relations. In September 2011, Dr. Flynn accepted an appointment by Northeastern University President Joseph E. Aoun to be the founding co-Director of the new George J. Kostas Research Institute for Homeland Security.

Dr. Flynn is the author of the critically acclaimed *The Edge of Disaster: Rebuilding a Resilient Nation* (Random House, 2007), and the national bestseller, *America the Vulnerable* (HarperCollins 2004). He is a Senior Research Fellow at the Wharton School's Risk Management and Decision Processes Center at the University of Pennsylvania. Since 9/11 he has provided testimony on twenty-six occasions on Capitol Hill. Dr. Flynn is one of the world's leading experts on maritime and transportation security issues. Prior to September 11, 2001, he served as an expert advisor to U.S. Commission on National Security (Hart-Rudman Commission), and following the 9/11 attacks he was the principle advisor to the bipartisan Congressional Port Security Caucus, and advised the Bush Administration on maritime and homeland security issues. He currently serves as a member of the bipartisan National Security Preparedness Group, co-chaired by former 9/11 commissioners, Governor Tom Kean and Congressman Lee Hamilton.

He is a frequent media commentator and has appeared on Meet the Press, 60 Minutes, The News Hour with Jim Lehrer, The Today Show, the Charlie Rose Show, CNN and on National Public Radio. Five of his articles have been published in the prestigious journal, *Foreign Affairs*. Excerpts of his books have been featured in *Time*, as the cover story for *U.S. News & World Report*, and as the subject of two CNN documentaries.

A 1982 graduate of the U.S. Coast Guard Academy, Dr. Flynn served in the Coast Guard on active duty for 20 years, including two tours as commanding officer at sea, received several professional awards including the Legion of Merit, and retired at the rank of Commander. As a Coast Guard officer, he served in the White House Military Office during the George H.W. Bush administration and as a director for Global Issues on the National Security Council staff during the Clinton administration.

Dr. Flynn received the M.A.L.D. and Ph.D. degrees in International Politics from the Fletcher School of Law and Diplomacy, Tufts University, in 1990 and 1991. He was a Consulting Professor at the Center of International Security and Cooperation at Stanford University from 2006-2010. He was a Guest Scholar in the Foreign Policy Studies Program at the Brookings Institution from 1991-92, and in 1993-94 he was an Annenberg Scholar-in-Residence at the University of Pennsylvania. In 2009, he received an honorary doctorate of laws from Monmouth University.

Dr. Flynn is the principal for Stephen E. Flynn Associates LLC, where he provides independent advisory services on improving enterprise resiliency and critical infrastructure protection, and transportation and maritime security. He also serves as Senior Security Advisor for Dowley Security Systems.

Bert Macesker

Executive Director
U.S. Coast Guard Research and Development Center

MR. MACESKER has 20 years of technology development and project management experience in the Coast Guard R&D Program. He has a Master's degree in Ocean Engineering and worked at Electric Boat Division of General Dynamics as a Research Test Engineer before starting his civil service career in the Coast Guard in 1990.

Early in his Coast Guard career, he worked as a Ship Test Director involved in developmental and operational test and evaluation on new acquisitions. He developed many new technologies including instrumented manikins for survival system testing, mission data recorders, electronic engine speed pilots, and shipboard emission measurement systems. He served as the Program Area Manager in Naval Engineering and Marine Inspection Technologies and then as the Risk Program Area Manager where he led a variety of efforts to assist the organization in achieving its risk competency goals. As the Chief for Analysis, Modeling and Simulation, his branch provided an analytic capability to minimize acquisition risk and maximize mission effectiveness through requirements and acquisition analysis, modeling and simulation (M&S), Human Systems Integration (HSI), and through risk and cost analysis project support.

His branch conducted major acquisition system alternatives analysis (IDS, OPC, CG-LIMS, IOC), pre-acquisition mission analysis (Arctic and Domestic Icebreaking Mission Analysis Reports), and provided decision support in the form of force package analysis, CONOPs exploration, and impact assessment of emerging technologies for many customers. His branch develops new analytic capability including the development of new simulation environments and tools like the Arctic Tactical Modeling Simulation Environment (ATME), Western Rivers Fleet Mix Analysis Tool (WRFMAT), Sensor Performance Optimization Tool (SPOT), and HSI system modeling capability that integrates human operator simulation in Coast Guard constructive models to better reflect total system performance.

As the Executive Director at the R&D Center, he is responsible for strategic planning, managing the civilian technical and support workforce, promoting the application of scientific and technological innovations, and managing the development of the project portfolio and budget build. He will need to be responsive to issues that are beyond the normal Coast Guard operational knowledge base and be forward-leaning in the Center's portfolio, development/recruitment of staff competencies, and in managing its business model that is one-step ahead, in a way that best positions the Center to be that strategic resource to the Coast Guard.

Adele J. Fasano

Port Director
Port of New York/Newark

MS. FASANO is the Port Director for the Port of New York/Newark. She oversees the sea, air and rail operations at one of the busiest ports in the United States, which includes the East Coast's largest cargo container seaport, and Newark Liberty International Airport.

A native of New York, Ms. Fasano returned in September 2007 to her Eastern roots, having served, since March 2003, as the Director of Field Operations of Customs and Border Protection under the U.S. Department of Homeland Security (DHS) in San Diego, California. Prior to that position, she was District Director for the San Diego Immigration and Naturalization Service (INS) for five years.

Ms. Fasano began her federal government service in 1985 working for the Office of Management and Budget in Washington, DC. She joined INS at its Headquarters Division in 1990 and served as the Deputy Assistant Commissioner for Inspections until 1996. She then went to the San Diego INS district office as Deputy District Director. She was promoted to District Director in 1998, serving until the DHS reorganization in 2003.

Ms. Fasano holds a Bachelor of Arts degree from Clark University and a Masters degree from the University of California at Berkley.

Captain Linda L. Fagan.

Captain of the Port
Captain of New York/New Jersey

CAPTAIN FAGAN, is the Captain of the Port of New York/New Jersey. In volume, the Ports of New York and New Jersey is the third largest port in the United States and overseas all 11 Coast Guard missions in the greater New York/New Jersey Area.

A 1985 graduate of the U.S. Coast Guard Academy, Captain Fagan's career has taken her to all seven continents. Over her 26 year career in the Coast Guard, Captain Fagan has held numerous positions including Division Chief of the Foreign and Offshore Compliance Office, Executive officer at Activities Europe in Rotterdam, the Netherlands as well as the executive assistant to the Commandant of the Coast Guard. Currently, in her role as Captain of the Port of New York and New Jersey, she was recently selected for promotion to Rear Admiral, lower half.

Captain Fagan has a Bachelor of Science in Marine Science from the U.S. Coast Guard Academy, a Master's in Marine Affairs from the University of Washington, and a Master's in National Security Strategy from the Industrial College of the Armed Forces. Her personal awards include the Legion of Merit, Meritorious Service Medal, three Coast Guard Commendation medals, and the Arctic and Antarctic Service medals.

Michele N. Siekerka, Esq.

Assistant Commissioner for Economic Growth and Green Energy
Department of Environmental Protection

Prior to joining the Department of Environmental Protection as its first Assistant Commissioner for Economic Growth and Green Energy, an office newly established by DEP Commissioner Bob Martin, MS. SIEKERKA, Esq. was president and CEO of the Mercer Regional Chamber of Commerce. Commissioner Martin's vision statement for the Department recognizes that a healthy environment and healthy economy go hand in hand. Ms. Siekerka's experience with New Jersey's business community coupled with her legal background provide the foundation for understanding the economic impact of regulatory processes, especially for small businesses and entrepreneurs.

Ms. Siekerka's new role is designed to work with all stakeholders—environmental advocacy organizations, large and small businesses and industry, local governments, and residents—to identify and create opportunities for economic growth while maintaining the highest standards of protection for the environment. She is the DEP's point person to help New Jersey tap the full potential of renewable energy by coordinating efforts with other state agencies and working to help businesses develop more opportunities for wind and solar power.

The Robbinsville resident was with the Mercer Regional Chamber of Commerce for over six years. Ms. Siekerka recently completed a year-long Ford Foundation Fellowship for Regional Sustainable Development, working with Chamber of Commerce and business leaders from across the nation to develop regional action plans. She also served on Governor Chris Christie's Red Tape Review Group.

Prior to the Chamber of Commerce, Ms. Siekerka worked with the Automobile Association of America as a senior legal consultant and vice president of human resources; prior to that, she was a partner in a Mercer County law practice.

Ms. Siekerka earned a BA in Political Science and German from Rutgers University and a JD from Temple University School of Law.

Isaac Maya, Ph.D., P.E.

Director of Research
National Center for Risk and Economic Analysis of Terrorism Events (CREATE)
University of Southern California

DR. MAYA has over 25 years experience in executive management, academic and industrial research and development, product development and technology transfer and commercialization. As a senior researcher with technical leadership, his experience is divided between industrial/commercial and academic environments, specializing in multi/interdisciplinary R&D, and ranging in scope from analysis of terrorism events to information technologies and systems to advanced nuclear power reactor systems.

Dr. Maya has served as CREATE's Interim Director, has been CREATE's Director of Research since its first year, and in key executive management capacity during the start-up phase of three new major university centers. CREATE has now carried out over 100 projects, and has had success both in the publication of fundamental research results in leading refereed journals, and in the deployment of practical implementations of these results in DHS field operations. Prior to CREATE, he was Director of the Industry and Technology Transfer Programs at USC's Integrated Media Systems Center (IMSC), an NSF Engineering Research Center.

Before USC, Dr. Maya was the Executive Program Manager of the Center for the Commercial Deployment of Transportation Technologies (CCDoTT), a DoD TRANSCOM-sponsored program at California State University, Long Beach (CSULB). He also served as Associate Director of the Innovative Nuclear Space Power Institute at the University of Florida, and as Director of Engineering and Product Development at a midsize manufacturing company.

Dr. Maya has 10 inventions in the chemical engineering, electronics, medical, and nuclear fields, over 100 technical publications, is a registered Professional Engineer (Nuclear) in California, and was an Astronaut Candidate Finalist in 1992.

Mr. Dave Newton

Science and Technology Directorate, Department of Homeland Security

CAPTAIN NEWTON, USCG (ret.) is a Senior Program Manager with Acquisition, Research and Logistics, Inc. and serves as a senior advisor to the Director, University Programs, DHS Science and Technology Directorate. He is also the project coordinator for the DHS S&T multi-disciplinary research effort—the Urban Commerce and Security Study. Captain Newton's last assignment, prior to retiring from the U.S. Coast Guard in 2010, was as the Department of Homeland Security's Science and Technology (S&T) Directorate's Senior Research Fellow to the Center for Technology and National Security Policy (CTNSP) at the National Defense University (NDU). CAPT Newton came to CTNSP from a three-year assignment as the Deputy Director for the Department of Homeland Security's Science & Technology Directorate's Borders and Maritime Security Division. While acting as the Director from 2007 to 2009, he structured a portfolio that focused departmental research and development efforts to align with operational capability gaps for the major components of DHS. Captain Newton's assignment, prior to S&T, was as the Coast Guard Executive Fellow to the National Defense Research Institute at the RAND Corporation. His research focused on capability based assessments of C4IT architecture in a new centric environment for the J6 staff and a small ship study for theater security cooperation for the U.S. Navy.

CAPT Newton has 25+ years of operational experience as an Officer for the United States Coast Guard. He has served in three Coast Guard Cutters including tours as Executive Officer (XO) and Commanding Officer (CO). His shore assignments include tours at the CG Telecommunications & Information Systems Command, XO of the Electronics Systems Support Unit (ESU) Miami, FL and CO of ESU Boston, MA where he oversaw all facets of C4IT for the Coast Guard in the Northeast U.S.

Captain Newton holds a B.S. in Electrical Engineering from the U.S. Coast Guard Academy and a Master's of Science in Computer Information Systems/Masters Certificate in Telecommunications Management from the University of Miami.

Robert L. Gibbs

Vice President—Garden State Offshore Energy, LLC
Manager Development—Renewable Energy, PSEG Global, LLC

MR. GIBBS is Vice President for Garden State Offshore Energy ("GSOE") and Manager Development—Renewable Energy for PSEG Global, LLC and responsible for the firm's interests in GSOE, a joint venture with Deepwater Wind, LLC, which seeks to build the nation's first offshore wind facility off the coast of southern New Jersey.

Before his current position, Mr. Gibbs held several positions within PSEG, including Manager— Corporate Properties, Manager—State Governmental Affairs, and Senior Attorney. His background brings a depth of expertise and insight into the legal, regulatory, and political challenges facing the offshore wind industry.

Mr. Gibbs has participated in several conferences and panel discussions on the offshore wind industry and Garden State's project at the Offshore Wind Development Conference—Washington, D.C.; the New Jersey Bar Association Public Utility Law Section's Annual Spring Conference; Rensselaer Polytechnic Institute's Workshop on Next-Generation Wind Power; Law Seminar International's Telebriefing on New Jersey's Offshore Wind Economic Development Act; Offshore Wind Power USA's 2nd Annual Conference in

Boston, Massachusetts; NJ Spotlight's Rountable on Offshore Wind in New Jersey; and most recently, Infocast's Turbines, Towers & Vessels 2011 Conference in Providence, Rhode Island.

Mr. Gibbs earned his Juris Doctor from Widener University School of Law—Wilmington, Delaware and Bachelor of Arts degrees in Political Science and History from the University of Rhode Island. He is a member of the New Jersey and Pennsylvania Bars.

RADM Arthur E. (Gene) Brooks (USCG Ret.)

Senior Director, Technical Organization
Maersk Line, Limited

As Senior Director, MR. BROOKS is responsible for the daily operating activities of a diverse fleet of over fifty ships in international trade. He is responsible for engineering management, cost control, budgets in excess of $500M, and a large staff of technical/operating personnel. Mr. Brooks is also responsible for day-to-day interactions with flag states, as well as federal and state regulatory agencies. He interacts with senior level international authorities in the development and implementation of policy regarding safety and maritime security.

As Deputy Commander of the Coast Guard Atlantic Area in Portsmouth, Virginia, Mr. Brooks was responsible for all U.S. Coast Guard operations within the eastern half of the world, from the Rocky Mountains to the Persian Gulf, from the Great Lakes to South America. His area of responsibility included five Coast Guard Districts, forty-two states with over 14 million square miles and more than 51,000 military, civilian, and auxiliary employees.

In 2006, Mr. Brooks was commissioned as the District Commander, Seventeenth Coast Guard District, Juneau, Alaska Coast for all operations in Alaska, the North Pacific, and the Arctic. Units and personnel patrolled over 3.8 million square miles of ocean and 33,000 miles of coastline. Due to the effects of climate change, he envisioned and designed the Coast Guard Arctic initiative. Over 4,000 search and rescue cases were conducted with 1200 lives saved.

As the Deputy Director for Operations for the U. S. Northern Command, Colorado Springs, Colorado in 2004, Mr. Brooks provided strategic planning and operational guidance for Homeland Defense and Defense Support to Civil Authorities missions throughout North America. Specific emphasis was on ballistic missile defense, special operations, anti-terrorism/force protection, mobile command and control, preparations for weapons of mass destruction or mass casualty events, and support to federal and state agencies on the Northern and Southwestern borders.

In 2000, Mr. Brooks was the Operational Commander, Coast Guard Greater Antilles Section, San Juan, responsible for all Coast Guard missions in the Eastern Caribbean and Western Atlantic. He supervised over 1200 personnel operating cutters and aircraft. As a virtual member of four U.S. Embassy Country Teams, he liaised with 14 Caribbean Heads of State, Governor/Executive Branch of the Commonwealth of Puerto Rico, Commander, U. S. Southern Command, and Joint Interagency Task Force South.

Mr. Brooks earned a Bachelor of Science from the U. S. Coast Guard Academy, and a Juris Doctor from College of William & Mary.

Lunch Speaker (Day 2)

Laurence Smallman

Defense Research Analyst
RAND Corporation

Laurence Smallman spent twenty-two years in the British Royal Navy. A warfare officer, he commanded two ships and held important appointments across a variety of policy, operational, and training areas – including those for policy and planning of overseas military activity, maritime force projection, and counter terrorism. At RAND, Laurence has developed his maritime security expertise in a range of projects for the DoD and UK MOD. In particular, projects for DoD have considered how to improve partner nation naval capacity, an AOA for Special Operations Forces, and continuing work for NAVSEA. Areas of special interest include the application and development of a framework to describe maritime disorder and the needs of maritime nations and the roles and missions for naval forces. He has participated in numerous workshops and conferences for the U.S. and British governments, organized and run several workshops for RAND and been interviewed as a maritime expert in the U.S., Caribbean and Europe.

William Hughes Watson

Deputy Commissioner for Maritime Affairs, Republic of the Marshall Islands
Vice President & Member of the Board of Governors, Maritime Security Council

MR. WATSON is Deputy Commissioner of Maritime Affairs in the Office of the Maritime Administrator of the Republic of the Marshall Islands (RMI), the world's third largest maritime registry with over 2,500 vessels weighing in at over 75 million gross tons. Mr. Watson is a member of the RMI delegation to the United Nations Contact Group on Piracy off the Coast of Somalia and is liaison on maritime security with the U.S. Department of Homeland Security (DHS), the US Office of Naval Intelligence (ONI) and the Naval Criminal Investigative Service (NCIS).

Mr. Watson also serves on the board of governors at the Maritime Security Council, the world's premier organization dedicated solely to the security of the maritime industry, and is a leading advocate for the security and policy interests of the global maritime and supply chain communities. Founded in 1988, the MSC is a not-for-profit organization that has played a pioneering role in developing the U.S. Maritime Transportation Security Act of 2002 (MTSA), and associated security 'best practice' programs such as the Carrier Initiative Program, the Supercarrier Initiative, Business Alliance for Secure Commerce (BASC), and the Customs-Trade partnership Against Terrorism (C-TPAT).

Prior to joining IRI and the Marshall Islands Registry, Mr. Watson was a senior journalist with Lloyd's Register—*Fairplay*, the London-based weekly magazine dedicated to the commercial shipping industry. He was most recently Deputy Editor at the *Americas* magazine, which was founded in 1883.

Mr. Watson is an alumnus of the University of South Carolina and served honorably in the U.S. Air Force, USAF Reserve and the South Carolina Air National Guard. He is an active member of the National Press Club, the Council of American Master Mariners, the U.S. Naval Institute and the American Legion.

Steven O'Malley

Coordinator, International Standardization Ship & Supply Chain Security Standards
Partner, Analytical Innovative Solutions LLC.

Prior to Analytical Innovative Solutions MR. O'MALLEY was the Director Supply Chain & Maritime Security for SAIC, and a career U.S. Coast Guard Officer. He has conducted port and supply chain assessments and process analyses in the U.S., Canada, South American, Europe, Asia, and the Mid-East for commercial and government clients. His recent work includes feasibility studies for the placement of LNG facilities in Europe and Alaska, and cargo throughput studies for six Brazilian ports.

Mr. O'Malley is currently the ISO convener for the development of an international Electronic Port Clearance (Single Window) standard. He has led the ISO teams that developed industry standards for port facility security, authorized economic operators, and guidance documents for implementing security management systems. He has a Masters in Transportation Management from Florida Institute of Technology.

Ken Hansen

Research Fellow
Centre for Foreign Policy Studies (CFPS), Dalhousie University

MR. HANSEN joined CFPS as a research fellow in 2010 after four years as the holder of the naval defense fellowship with the centre. He is a Lecturer in the Department of Political Science. Before joining CFPS, he was the Military Co-Chair of the Maritime Studies Program at Canadian Forces College in Toronto. He retired from the navy in 2009 in the rank of commander after a 32-year career.

Mr. Hansen is the team leader for the Maritime Security Policy Program's research theme investigating Piracy, Illegal Migration, and Crime at Sea. He is a member of the editorial board for *Canadian Naval Review*, and serves as the moderator for *Broadsides*—the on-line discussion forum of the journal. He is also a member of the Science Advisory Committee for the Halifax Regional Marine Institute. His other research interests include maritime security theory, naval operational doctrine with emphasis on planning processes and logistical requirements, as well as joint and interagency doctrine.

Mr. Hansen completed a Master of Arts Degree in War Studies from the Royal Military College of Canada in 2005, winning the Barry D. Hunt Memorial Prize as the top graduate student. His thesis, *"Fuel Endurance and Replenishment at Sea in the Royal Canadian Navy, 1935-1945,"* was awarded the Jacques Cartier Prize by the Canadian Nautical Research Society as the year's best graduate thesis on a nautical subject in Canada. His other literary awards include the Hannington Millennium Essay Prize and the Bruce S. Oland Prize. His most recent books are *Marines: Is an amphibious capability relevant for Canada?* and *Breaking the Box: The increasing demands of non-combat roles on maritime forces*, both published by the Centre for Foreign Policy Studies. He has published articles in *Canadian Military Journal, Canadian Naval Review, Frontline, Maritime Affairs, Naval War College Review* and *The Northern Mariner*. He has also written book reviews for *Canadian Naval Review, Maritime Affairs, The International Journal of Maritime History* and *The Northern Mariner*.

LCDR Mark Sawyer,

Safety Detachment Supervisor
United States Coast Guard

LCDR SAWYER has over 12 years of marine safety, security and environmental protection experience in the United States Coast Guard. He specializes in flag/port state vessel inspections, casualty investigations, waterways management, and oil spill prevention and response. He is currently seconded to the World Maritime University as a Lecturer. He teaches international maritime conventions and maritime best practices to graduate students representing the global maritime community. He has served in various capacities while in the United States Coast Guard, filling the most challenging leadership positions at critical units on the coast and on the inland rivers. Most recently, he was assigned as the Marine Safety Detachment Supervisor in Fort Myers, FL, on the West Coast of Florida, where he spearheaded all marine safety, security, and environment al protection missions within an area of responsibility consisting of five FL counties and 4,400 miles of coastal and inland waterways.

He has a Bachelor's degree in Biology and Master's degrees in Occupational Safety and Health and Business Administration.

Captain David Moskoff, USMS

Assistant Dean
United States Merchant Marine Academy

CAPT MOSKOFF is Assistant Dean and a Professor in the Marine Transportation Department at the United States Merchant Marine Academy. He is also currently teaching Bridge Resource Management (the capstone simulation course) and has been the Lead Instructor in Electronic Navigation since 2002. He was recently Faculty Forum President and is now the Chair of the Standards of Training, Certification and Watchkeeping (STCW) Council, which necessitates he be the USMMA point of contact for the USCG/NMC. He is also the point of contact for the DOD's Defense Threat Reduction Agency (DTRA), often providing midshipmen Independent Study focused in related Maritime Security and Counter-Terrorism venues. He is especially engaged in Maritime Security sectors and activities having specialties in areas such as: Port Safety and Law Enforcement Activities, IT(Information Technology) Assessment & Cyber Defense; Threat Assessment, Counter Terrorism and Marine Piracy; Marine Simulation and Bridge Resource Management; Electronic Navigation; Contingency Planning; Tankers & Gas Carriers; Marine Firefighting, Mooring, Shiphandling, Single Point & Offshore Moorings; Automatic Identification Systems(AIS), Maritime Distress Communications, Search & Rescue and Vessel Traffic Systems.

CAPT Moskoff is also President of MARITECH, a marine consulting and services firm entering its third decade of service to the marine industry. He has been certified as an American Bureau of Shipping (ABS) ISO/ISM third party external auditor as well as a certified third party auditor for the American Waterways Operators' Responsible Carrier Program. He holds a current USCG Unlimited Master's License and has commanded both steam and diesel ships during his many years at sea. CAPT Moskoff has particularly strong experience aboard tankers and gas carriers.

Michael T. Harpster

Assistant Special Agent in Charge (ASAC)
Federal Bureau of Investigation

In 2010, MR. HARPSTER was appointed to Assistant Special Agent in Charge (ASAC) Newark Division for the Intelligence Program. As the ASAC for the Intelligence Program, Mr. Harpster oversees collection, dissemination, production and threat reduction in the State of New Jersey.

In June 2007, Mr. Harpster was selected to become the supervisory senior resident agent of Newark Division's Franklin Township Office where he had supervisory responsibilities of violent serial take-over bank robbery crews. Mr. Harpster further supervised public corruption investigations, which led to the indictment of the Mayor of Perth Amboy, and corruption investigations into two school superintendents.

In January 2006, Mr. Harpster reported as the supervisory special agent (SSA) of the Violent Crime and Interstate Theft Task Force of the FBI's Newark Division and had oversight responsibility for all investigations.

In August 2003, Mr. Harpster was promoted to SSA, Counterterrorism Division, Communications Exploitation Section, FBI headquarters. In this position, Mr. Harpster had responsibility for coordinating investigations, which included program management of major cases such as the BRIT BOMB I, II. Previously, he was employed by the U.S. Drug Enforcement Administration.

Mr. Harpster earned a Bachelor of Science Degree in Criminal Justice, Northeastern University; and a Masters Degree in Public Administration, Northeastern University.

Charles Dragonette

Commercial Maritime Operations Analyst
Office of Naval Intelligence, NIMITZ Operation Intelligence Center

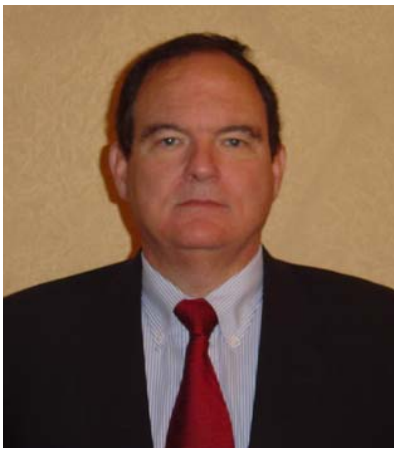
MR. DRAGONETTE is The Senior Commercial Maritime Operations Analyst with the Office of Naval Intelligence's NIMITZ Operation Intelligence Center. He served afloat and ashore in the U. S. Navy and the commercial maritime industry before joining ONI in 1971.

Mr. Dragonette's civil maritime experience at ONI includes China maritime affairs, piracy and maritime crime, cruise ship security, industry exchanges and outreach, flags of convenience and ship registry. He currently serves as the ONI Subject Matter Expert for Shipping Operations and Infrastructure.

Mr. Dragonette has been a lecturer and featured speaker at the U. S. Merchant Marine Academy, Kings Point, NY; the Maritime Security Council; National Defense University; and Naval Academy. His maritime security commentary has appeared in Foreign *Affairs, The Bulletin of the Atomic Scientist* and *Seapower*. He was featured in The History Channel's program "*Return of the Pirates*" and on Voice of America's "*On the Line*" TV roundtable on Somali Piracy.

Significant awards include the Maritime Security Council man of the year (2001); Department of the Navy Superior Civilian Service Award (2004), ONI Core Values Award (2006) and Navy Distinguished Civilian Service Award (2011).

Keynote Address (Day 3)



Robert G. Ross, Captain, USCG (Ret.)

Chief, Risk Sciences Branch, Science and Technology Directorate, Department of Homeland Security

CAPTAIN ROSS is currently serving as the Chief of the Risk Sciences Branch in the DHS Science and Technology Directorate. In this position, he has sponsored and conducted research into homeland security decision-making in the face of adaptive, reactive, intelligent and strategically-driven adversaries. He has also been actively working to improve the maturity and capability of risk analytics in homeland security.

On active service from 1973 to 2003, Captain Ross spent the majority of his career in the Marine Safety and Environmental Protection programs. He also served on a polar icebreaker and in engineering, personnel and military readiness staff positions. Duty stations included Baltimore, MD; Washington, DC; Guam; Norfolk, VA; London, England; New Orleans, LA; Miami, FL; and San Juan, Puerto Rico. In his last operational assignment he was Captain of the Port and Officer in Charge of Marine Inspection in San Juan where he was responsible for commercial shipping safety, port safety and security and marine environmental protection activities in Puerto Rico and the U.S. Virgin Islands. While in San Juan, he served as the Federal On-Scene Coordinator for several major incidents including the MORRIS J. BERMAN oil spill, the largest US oil spill since the EXXON VALDEZ and the largest and most successful oil spill response ever managed in its entirety by the Coast Guard. While serving as the Chief, Office of Vessel Traffic Management in CG Headquarters, Captain Ross headed US delegations to three successive negotiating sessions of the International Maritime Organization's Navigation Sub-Committee. In this position he directed the development of the Ports and Waterways Safety Assessment (PAWSA) methodology for assessing vessel traffic risks in restricted waterways. The PAWSA methodology was subsequently adopted by the International Association of Marine Aids to Navigation and Lighthouse Authorities as the world standard process for performing that kind of risk assessment. His final position in the Coast Guard was as the Chief, Office of Strategic Analysis from which he advised the Commandant and other senior Coast Guard leaders on emerging issues, including Homeland Security, which would impact the Coast Guard.

Captain Ross holds a BS in Ocean Engineering from the USCG Academy and an MS in Systems Management from the Florida Institute of Technology. He was also a fellow in the MIT Center for International Studies Seminar XXI program. He has been awarded the Legion of Merit, the Meritorious Service Medal, the CG and Navy Commendation Medals and the CG and Army Achievement Medals. Captain Ross has authored or co-authored, primarily with former Deputy Secretary of Homeland Security Admiral James M. Loy, several published papers on various aspects of Homeland Security. He also authored widely-presented papers on the use of risk information in homeland security decision-making.

November 9, 2011 RESEARCH DAY

8:30-9:00 **Key Note: Robert G. Ross**, Chief, Risk Sciences Branch, Science and Technology Directorate, U. S. DHS**, John F. Lathrop**, Ph.D., Systems and Intelligence Analysis, Lawrence Livermore National Laboratory

Research and Education Challenges in Risk Analysis and Risk Management

Risk Management has been failing, especially so in the face of emergent 21st Century risks such as global financial market fragility, climate change, terrorism and transnational crime, to name only a few. There is even a recent book titled "The Failure of Risk Management." Less clear, however, is why this is so. This presentation is based on two theses. The first, which points to the educational challenge, is that neither Risk Managers nor Risk Analysts have a sufficient understanding of what "Risk Management" really entails. A risk management cycle and its corresponding questions, based on foundational ideas of pioneers such as Kaplan, Garrick and Haymes, will be offered as a starting point to address the knowledge gap. The second thesis, which points to the research challenge, is that current risk management practices and the available array of analytical approaches employed in Risk Analysis are both inadequate for the kind of large-scale system risks increasingly being encountered. To explain why this is so, a four tier risk typology will be offered. The typology is based on an examination of the history of risk management as well as identification of fundamental characteristics which determine the need for and appropriateness of various analytic and risk control approaches. In particular, the reasons why traditional risk analytic and risk management approaches are proving inadequate for complex and complex adaptive system risks will be discussed. Finally, alternative approaches to the analysis and management of complex system risks and suggested research lines will be presented.

The views expressed in this paper are those of the authors and do not necessarily reflect the views of the Department of Homeland Security, Lawrence Livermore National Laboratory, the Department of Energy or any other agency of the U.S. government.

9:00-9:20 **David Ebert**, VACCINE, Purdue University

Risk-Based Visual Analytics for Maritime Resource Allocation

In this talk, I'll describe the enabling capability of interactive visual analytic environments for risk-based resource allocation and decision making. Examples in multiple coast guard mission areas and disaster management will be shown to illustrate the capabilities.

9:20-9:40 **Milind Tambe, Bo An** and **Eric Shieh**, CREATE, University of Sothern California

ARMOR-PROTECT: An Application of Game Theory to the USCG's PWCS Mission

The use of game theoretic techniques for intelligent randomization of patrols has demonstrated significant promise in stretching limited patrol resource and improving deterrence effect. The University of Southern California's (USC) National Center for Risk and Economic Assessment of Terrorism Events (CREATE) developed the Assistant for Randomized Monitoring Over Routes (ARMOR) software, which provides a methodology and tool for creating randomized plans and schedules for monitoring, inspecting, and patrolling, so that even if an attacker observes the plans, he/she cannot predict its progression -- thus providing risk reduction via deterrence while guaranteeing the specified level of protection quality.

The ARMOR research team developed and applied general methods for randomizing security strategies (patrols, checkpoints, inspections, etc.) based on rigorous game-theoretic modeling and solution algorithms. ARMOR provides the fastest known algorithms of its type to generate randomized schedules from the game-theoretic formulation of the problems for optimal security allocation. The research focuses on improving the effectiveness of limited security resources by intelligent randomization, accounting for the capability of adversaries to observe and exploit predictable security methods and schedules. ARMOR was deployed at the Los Angeles International Airport (LAX) in August 2007 to randomize checkpoint deployment and canine unit allocation. A second variant, ARMOR/IRIS, is in use by the Federal Air Marshals Service (FAMS) since October 2009 for certain (unknown) international destinations.

The United States Coast Guard (USCG) Research and Development Center (RDC), in collaboration with CREATE, developed the ARMOR- Port Resilience Operational/Tactical Enforcement to Counter Terrorism (ARMOR-PROTECT) version, an optimized randomization resource allocation modeling methodology. This effort focused on the USCG's Ports Waterways and Coastal Security (PWCS) mission, which is mainly to deter acts of maritime terrorism in the nation's ports, waterways, and coastal regions. The prototype ARMOR-PROTECT model is a set of algorithms used to explore and test various randomized PWCS scheduling hypotheses involving application of game theory. Test results are presented in a spreadsheet containing sample PWCS schedules. These spreadsheet schedules are the basis for post processing analysis used to report findings and conclusions. The ARMOR-PROTECT model proof-of-concept development showed that game theory applications can be used to create optimized and randomized PWCS patrol schedules.

9:40-10:00 **Michael Orosz** and **I. Maya**, CREATE, University of Sothern California

PortSec: Port Security Resource Allocation and Cost-Benefit Analysis

The University of Southern California's (USC) National Center for Risk and Economic Analysis of Terrorism Events (CREATE) has developed the Port Security Risk Assessment and Resource Management System (PortSec). PortSec supports both tactical risk-based security resource allocation and long-term strategic operations planning. In tactical

operations, PortSec uses critical information from the port complex (including surrounding communities and environments) and assesses the risk of attack (from various modes) on various regions/areas of the port. PortSec allows the lead security officer, risk analyst or decision-maker to quickly grasp the overall risk profile for the port, identify conditions requiring immediate attention, analyze the anticipated impact (both positive and/or negative) to port operations resulting from reallocating security resources to redistribute the risk, and counter the anticipated attack threat. PortSec also allows for "what-if" analysis which allows decision-makers to weigh the pros and cons of implementing different counter-measure strategies (i.e., resource allocations) to mitigate attack threat.

In strategic operations, PortSec allows decision-makers to anticipate the impact on overall risk resulting from strategic configurational/structural changes to the ports. Such strategic changes could include expansion of port operations (e.g., a new terminal) or the introduction of new counter-measure technologies (e.g., scanner technologies). In both the tactical and strategic modes, after a resource allocation is made, the reported impact from that change includes the anticipated change in risk from being attacked, the anticipated economic costs for implementing the counter-measure and the environmental costs. Currently, the prototype tactical version of PortSec is being evaluated by the Ports of Long Beach and Los Angeles.

PortSec has an added feature that its fundamental framework can be used to assess the environmental impacts and costs of resource allocation decisions. Underlying calculation models, which realistically simulate port operations, can be used to provide carbon footprint information and any other environmental information needed to inform decision-making. This feature is unique to PortSec, and can be implemented in parallel with its risk and security development.

10:00-10:20 **Amir Ghafoori** and **T. Altiok**, CCICADA and CAIT, Rutgers University

Sonar Placement in Ports and Waterways

A grid-based optimization model is proposed to keep ports and waterways under surveillance against terrorist attacks launched under water. The attackers might be divers, AUV's or hull mounted objects, while a specific type of sensor called Sonar is utilized for detection. The model investigates various aspects of sensor placement problems for underwater application and attempts to put sensors in the set of candidate grid points. Each sensor type brings its specifications to the model and poses a level of complexity. Moreover the optimization is subject to budget constraint for placing sonars. Finally an optimal scheme of sensor positioning is proposed in order to minimize the average total risk in the field.

10:40-11:00 **T. Wakeman, H. Gajjar, J. Ramirez-Marquez**, and **H. Salloum**, Stevens Institute of Technology

Developing a Resiliency Framework for Regional Freight Platform Seaports have become critical nodes in the global supply chain. Disruption in maritime and landside logistic services at seaports can cause significant economic impacts. Security investments are made to reduce the risk of service disruptions and to restore throughput to prior levels of service following a disruption. How should investments be made to maximize supply chain

resiliency? Research is underway to develop a decision support framework to evaluate resiliency benefits from regional freight platform collaborations. The Port of New York and New Jersey faces challenges to maintaining uninterrupted logistic services because of the potential impacts of hurricanes, labour disputes, or other problems. A specific proposal for establishing a logistics partnership between northern port assets in New York-New Jersey metropolitan area with port assets in the southern New Jersey-Pennsylvania area is being examined. There is competitive tension between the regions that is a hurdle to collaborative business action but there are also potential resiliency benefits for both regions. The research is using a systems approach for identifying key performance metrics, figures of merits, and unit(s) of benefit for the freight region to come up with a generalized template for evaluating freight platform performance in terms of economic development and supply chain resiliency.

11:00-11:20 **Raghav Pant, K. Barker** and **T. L. Landers,** School of Industrial Engineering, University of Oklahoma

Resilience Modeling for Post Disaster Recovery of Interdependent Industries and Infrastructures: Application to Inland Port Disasters

In this study, we look at the post-disaster resilience of interdependent industries and infrastructures. We use a dynamic model for studying inoperability and provide guidelines for modeling the resilience that reflects the interdependent structure of the economy and the severity of the risk faced. Our resilience structure provides guidelines about the preparedness of industries before the disaster such that they achieve desired levels of recovery with minimum errors. We apply dynamic data assimilation concepts to our dynamic inoperability model to develop a controllable, observable solution to disaster effect and mitigation. We apply our approach to post-disaster recovery planning for the Port of Catoosa, an inland waterway port in Oklahoma. We simulate the daily flow of commodity import-exports through the port and assume that a disruption causes an initial loss of supply leading to inoperability in sectors. We suggest metrics of resilience, maximum daily loss, total industry loss, and total regional loss as indicators for preferred planning options for industry and infrastructure.

11:20-11:40 **Heather Nachtmann, J. R. Chimka, E. A. Pohl, L. M. Pohl**, College of Engineering, University of Arkansas, **Henry J. Mayer, J. Rovito**, Bloustein School of Planning & Public Policy, Rutgers University

Supporting Secure and Resilient Inland Waterways

Researchers at the Mack-Blackwell Rural Transportation Center (MBTC) at the University of Arkansas, in close collaboration with researchers at the Center for Transportation Safety, Security & Risk (CTSSR) at Rutgers University, are developing a prototype decision support system that integrates geographic information system (GIS) technology and computer-based freight movement models to provide timely knowledge and awareness of what cargoes should be prioritized for offloading in response to a catastrophic closure of one or more sections of the inland waterway system and what infrastructure exhibits low resiliency in terms of modal capacity to potential attacks or natural disasters against inland waterway transportation systems. This is a three phase project that considers type, volumes and

frequency of different barge cargoes traversing the Upper Mississippi River study area as well as information on the capacity of ports and land-based rail and highway systems in this same study area to accept and transport these cargoes. The output of this decision support system will also identify infrastructure that exhibits low resiliency in terms of modal capacity to potential attacks or natural disasters against inland waterway transportation systems.

11:40-12:00 **Fred Roberts**, CCICADA, Rutgers University

Algorithmic Decision Theory and the Port Reopening Scheduling Problem

When a port needs to be reopened after closure due to a natural disaster or terrorist event or domestic dispute, certain goods on incoming ships might be in short supply. If a damaged port is to be reopened, we face the problem of making decisions about how to re-prioritize the delivery of goods and reschedule the ships' arrival times. These problems can be subtle as they can lead to significant new priorities for delivery of incoming goods. It would be good to develop methods for scheduling and prioritizing in reopening a port that are efficient and effective and make use of today's sophisticated algorithmic tools, tools that allow us to make decisions algorithmically. This talk describes relevant tools of the field coming to be called "algorithmic decision theory" and formulates the problem of scheduling the unloading of waiting ships to take into account large amounts of data about ships' manifests, revised desired arrival times, and revised quantities and priorities for delivery of goods on those ships. Several objective functions will be defined and methods for solving the formulated problems will be discussed.

13:40-14:00 **Kash Barker, R. Pant, H. Baroud** and **T. L. Landers**, School of Industrial Engineering, University of Oklahoma

Interdependent, Multi-regional Impacts of Inoperability at Inland Waterway Ports

This work describes the interdependent adverse effects of disruptive events on inter-regional commodity flows resulting from disruptions at an inland port terminal. To do so we integrate a risk-based dynamic multi-regional interdependency model, which measures the cascading regional effects of disruptions to interconnected industries, with models that simulate port operations such as commodity arrival, unloading, sorting, and distributing. Such models capture four disruption scenarios at the port and provide measures of impact to industries that use the inland port terminal facility. We investigate these disruptive scenarios affecting the daily commerce in the port supply chain and combine these with the interdependency model to quantify the adverse impacts of disruptions on industry resilience and inoperability across multiple regions. Such an approach enables risk-based decision making for inland port preparedness. A case study highlights the disruptive effects of a closure of the Port of Catoosa in Oklahoma and the broader Arkansas River Navigation System.

14:00:14:20 **Kevin Montgomery**, Lead Investigator, Center for Island, Maritime, and Extreme Environment Security (CIMES), University of Hawaii

A Next-Generation Integrated Sensor and Data Fusion System for Force Health Protection and Homeland Security

Rapid detection of threats requires constant surveillance and analysis of multimodal, disparate, incomplete information from sensors, personnel, intelligence, and other data sources. Proactive mitigation of the impact of a threat and ongoing management of an incident necessitates real-time decision making with timely access to information on resources, capabilities, and impact, along with collaboration and dissemination tools to ensure stakeholders across multiple organizations and geographic regions are aligned for maximum effect.

We have been developing, deploying, and field testing an integrated suite of medical and environmental sensor technologies with NSF, DOD, DHS and other partners, together with a plug-and-play, modular architecture for real-time data acquisition, transmission, integration, and analysis, display, and collaboration via a secure online Portal. The system integrates a large amount of data (currently over 2.1M layers) from other sensor systems, open-source data, GIS databases, and aerial and satellite imagery, along with an open framework analysis, simulation, and modeling. The devices and system are fully operational and have been deployed worldwide for a number of recent applications, including Disaster Response, Border Patrol, and Personnel Exposure management. This presentation will include results from requirements analysis across the needs of DOD, DHS, and other partners, will include results from these recent field tests, and may include a live demonstration of the devices and worldwide data access, as time permits. The needs and resulting technologies provide a broad overview of general utility for ISR, force health protection, disaster management, and other applications.

14:20-14:40 **Iris Heckman**, Karlsruhe University, Germany

An Analysis System for the Quantitative Assessment of Supply Chain Risks

As today's supply chain networks are worldwide-spread complex systems, disruptions and unexpected deviations can lead to devastating and far-reaching consequences. The literature on supply chain risk analyses is mostly of anecdotic nature, while few authors present empirical research. Unfortunately, not much effort has been done for the quantification of supply chain risk and vulnerability drivers.

In our approach we combine simulation and operational supply chain planning in order to identify relevant supply chain factors, i.e. factors which enhance the vulnerability of complex supply networks. Our approach adopts scenario-generation techniques in order to efficiently evaluate changes in planning results evoked by modified input data, i.e. modified factor values. The overall identification process consists of two stages: The screening stage identifies those factors, which have a meaningful influence on performance indicators. Applying methods from experimental design, like a.o. Plackett-Burman designs, factors with significant effects can be separated from those with small effects. The second stage identifies

the quantitative relationship between changes in factor values and resulting deviations in performance indicators. Therefore, a grid algorithm sequentially analyses scenario-based planning-results and generates new scenarios to be planned and analyzed.

We present preliminary computational results for both stages along with implications for further research directions.

14:40-15:00 **Adam Rose** and **D. Wei,** CREATE, University of Sothern California

Measuring Economic Risk Benefits of USCG Marine Safety Programs

The benefits of the Marine Safety Programs of the U.S. Coast Guards can be estimated as the probability-weighted potential losses the regional and national economy would suffer due to the absence or failure of the programs. We analyzed the economic impacts of two port shutdown scenarios to the Port Arthur/Beaumont MSA Region and the U.S. The first scenario, Medium Consequence Scenario, is a four-day shipping disruption of Port of Beaumont due to the fuel oil spill from a tank ship. The second scenario, Complete Port Shutdown Scenario, is a complete shutdown of both Port of Port Arthur and Beaumont for 3 months.

Medium term shutdowns of the Port of Beaumont and Port Arthur have potentially devastating economic consequences, especially to the Port Region. Annual losses in terms of gross output (sales revenue) in the Port Region can reach $452 million for the Medium Consequence Scenario and $12.7 billion for the Complete Port Shutdown Scenario, representing declines of 57.8% and 71.4% of baseline gross output for the periods of the disruption (4 days and 3 months, respectively). Impacts are much larger in absolute terms, but much less in relative terms, for the nation as a whole in both scenarios as compared to impacts in the Port Region. Output reductions for the Medium Consequence Scenario are $3.7 billion and for the Complete Port Shutdown Scenario are $164.9 billion, representing declines of only 1.2 % and 2.4% of baseline national gross output for the duration of the disruptions. The U.S. economy is much less dependent on imports into the Port Arthur/Beaumont than is the Port Region itself. This is also indicated by the very sizeable decreases in impacts at the national level due to resilience, which reduces the losses by more than 90% for the Medium Consequence Scenario and by nearly 95% for the Complete Port Shutdown Scenario. Still, the $8.5 billion residual loss for the Complete Port Shutdown Scenario is a large absolute amount despite the fact that it represents less than 0.1% of U.S economic output over a 3-month period.

Additional costs of port disruptions include the environmental cost of an oil spill, the cost of shipping delays and the security value of using crude oil from the Strategic Petroleum Reserve. The sum of these additional costs is around $20 million. The environmental impacts are stated in terms of reduction of commercial fishing and recreation, however, and do represent both direct and indirect output losses. Overall these miscellaneous costs are significant at the Port Region level, but trivial in the national context.

15:20-15:40 **Jesus Rios**, IBM T.J. Watson Research Center, USA, **D. R. Insua**, Royal Academy of Sciences, Spain and **J. C. Sevillano**, Complutense University, Spain

Adversarial Risk Analysis: The Somali Pirates Case

Some of the current world's biggest problems revolve around security issues. This has raised recent interest in resource allocation models to manage security threats. One of those approaches is adversarial risk analysis. We show here how such framework may cope with a current important maritime security issue in relation with piracy in the Somali coasts. Specifically, we describe how to support the owner of a ship in managing risks from piracy in that area. We illustrate how a sequential defend-attack-defend model can be used to formulate this decision problem and solve it for the ship owner. Emphasis will be put on explaining how we can model the Pirates thinking in order to anticipate their behavior and how it would lead to a predictive probability distribution, from the defender's perspective, over what the Pirates may do.

15:40-16:00 **Ronald Pelot** and **R. C. Hilliard**, MARIN, Dalhousie University

Maritime Traffic Modeling for Risk Assessment and Response Planning

The risks associated with maritime traffic are affected by the vessel types and the temporal and spatial distribution of the flow volumes, amongst other factors. Our traffic models include a wide range of activities such as commercial shipping, cruise vessels, ferries, commercial fishing, aquaculture tending, commercial recreational boating, and private pleasure boating. The availability and resolution of the data for various activity categories affect what types of simulation models yield the most reliable picture. These models can be used for examining accident risks, spill risks, and coastal security issues. Accident risks have been evaluated based on the Canadian Coast Guard's SISAR dataset, with diverse studies focussing on commercial ship type, fishing fleet, seasonal factors, weather factors, geographic features, and other factors. Resource location/allocation models were developed for strategic planning to guide the placement of new lifeboat stations, and on the tactical level for evaluating the impact of adding, removing, or relocating response vessels. The traffic models have also been used to improve maritime domain awareness for costal security, and in particular to assist with anomaly detection by comparing individual trajectories with expected common routes generated through pattern analysis.

16:00-16:20 **James Rice**, CSR, Massachusetts Institute of Technology

US Port Operational Risks and the Call for Port Resilience

Given the growing volume in global trade flows and the dependence upon those trade flows to enable global economic activity, system resilience is an important capacity to design and build into the maritime transportation system, especially the (sea) port environment. The seaport is a complex environment, and the concept of resilience is not yet understood or even developed for maritime commerce in the seaport. To better understand the perception of resilience in the maritime environment and the challenge of applying resilience concepts to

the port environment, a survey of 525 shippers, carriers, terminal operators, port authorities, and third parties was conducted. This talk will discuss the concept of port resilience and provides a descriptive definition based on the survey, literature review and field visits to coastal and inland waterway seaports. Additionally, a first-of-its kind capacity analysis of seaports in the US will be reviewed. The capacity study revealed significant limitations and vulnerabilities for cargo flow through US sea ports. A software tool for rapid assessment of contingency options will be introduced using the capacity study to help identify options for allocating displaced cargo volume in response to disruptions, matching SIC classifications and considering shortest seaborne distance from point of disruption.

16:20-16:40 **Ozhan Alper Almaz, Amir Ghafoori**, **Tayfur Altiok,** CCICADA and CAIT, Rutgers University

Risk Analysis of the Maritime Traffic in Delaware River

A model-based mathematical risk analysis in the Delaware River and Bay (DRB) area was carried out to identify which zones of the river have higher risks, what the magnitudes are and what the possible mitigation measures may be. First, a probabilistic risk model was developed considering all possible accidents as suggested by the historical data in the DRB. Expert opinion elicitation process helped computing the unknown accident and consequence probabilities. The next step was to incorporate the risk model into the simulation model to be able to evaluate risks as observed in simulation. Since the simulation model provides visits to every possible situation in the river, the joint risk/simulation approach makes it possible to produce a risk profile of the DRB. A scenario analysis in the end was performed in order to study the behavior of accident risks and arrive at some mitigation suggestions. This analysis also allowed us to investigate the impact of deepening on the risk profile of the river. In this work, a highly practical approach was developed to evaluate risks in the maritime domain and it can be used to evaluate risks in any other system of interest as well.

CAIT Overview

About Rutgers' CAIT

Rutgers' Center for Advanced Infrastructure and Transportation (CAIT) focuses its work on the systems that keep our country mobile and prosperous, solving complex issues in high-volume, multimodal corridors.

CAIT's researchers and engineers address the critical infrastructure challenges our country faces now and in the future: public safety, national security, mobility, congestion, reducing environmental impacts, economics, infrastructure health monitoring and rehabilitation, and asset management.

CAIT is a Tier I University Transportation Center (UTC), one of a network of research and educational organizations sanctioned and supported by the U.S. Department of Transportation (USDOT).

As part of Rutgers, The State University of New Jersey, CAIT is geographically positioned in the midst of the most densely populated and heavily traveled region in the United States. Taking advantage of its proximity to the nation's third largest port, the busiest rail line, and four major international airports, CAIT uses the area as an *in situ* laboratory to study multimodal transportation issues.

Our research, education, and technology transfer programs concentrate on pavement, nondestructive evaluation, traffic safety, port security, maritime/supply chain operations, and much more.

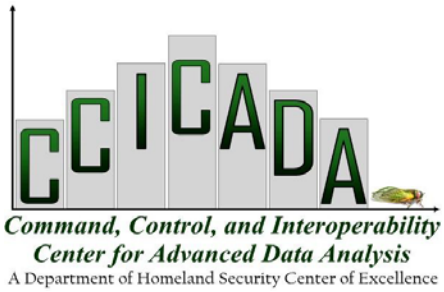
CAIT is a leader in forging public-private partnerships for its many research endeavors. We are committed to moving research from the lab to real-world applications that solve real-world problems, advancing state-of-the-art technologies, and preparing the next generation of transportation professionals.

Bolstered by government, industry, and academic partners, we strive to make the country's infrastructure safer, more durable, and more efficient.

Contact:

Center for Advanced Infrastructure and Transportation (CAIT)
100 Brett Road
Piscataway, NJ 08854-8058
732-445-0579
cait.rutgers.edu

CCICADA Overview



The U.S. Department of Homeland Security (DHS) Center of Excellence in Command, Control and Interoperability was established in 2009 to build the mathematical and computational foundations for deriving knowledge and understanding from massive amounts of unstructured data. The Center will help this nation's 2.3 million homeland security personnel perform their jobs more effectively by turning floods of data into actionable information. The center consists of two free-standing parts – one led by Purdue University in visualization sciences and the other led by Rutgers University in data sciences.

The Rutgers component, known as the Command, Control and Interoperability Center for Advanced Data Analysis (CCICADA), is developing the types of data analytic capabilities that homeland security relies on to ferret out patterns and draw inferences from massive amounts of unstructured data contained in books, newspapers, reports, blogs, images, geospatial data, sensor readings, and audio and video streams. CCICADA researchers are developing new capabilities for absorbing and analyzing the potentially vast quantity of information contained in such media, and they are building the mathematical foundations for a new generation of computational methods being developed. Center research touches a wide variety of applications that include: container inspection in ports; sensor management for nuclear detection; syndromic surveillance for early warning of disease outbreaks; risk analysis; data management for law enforcement and emergency response; defense against attacks on cyberinfractucture; and resource planning for infrastructure protection. Through these and other applications we partner with a wide variety of agencies in local, state, and federal government, as well as in the private sector.

CCICADA is committed to building pioneering educational programs that are fully integrated with ongoing research and designed to meet a broad spectrum of educational needs. CCICADA involves graduate students in all of its research projects and hosts a variety of summer programs tailored to the needs of graduate and undergraduate students, college faculty, homeland security professionals, and K-12 teachers. Programs for educators feature new courses, certificate programs, guidance for faculty who want to bring homeland security topics into their classrooms.

CCICADA Partner Institutions	
• Rutgers University (Lead)	• Carnegie Mellon University
• The City College of New York	• Howard University
• Morgan State University	• Princeton University
• Rensselaer Polytechnic Institute	• Texas Southern University
• Tuskegee University	• University of Illinois at Urbana/Champaign
• University of Massachusetts – Lowell	• U. of Medicine and Dentistry of NJ
• University of Southern California	• Alcatel-Lucent Bell Labs
• AT&T Labs – Research	• Geosemble Technologies
• Regal Decision Systems	• Telcordia Technologies

DIMACS Overview

DIMACS

Center for Discrete Mathematics & Theoretical Computer Science
Founded as a National Science Foundation Science and Technology Center

Founded in 1989 as a prestigious National Science Foundation Science and Technology Center, DIMACS addresses fundamental problems in discrete mathematics, theoretical computer science, statistics, and related areas, and their applications to a wide variety of topics including telecommunications, information technology, the life sciences, engineering, public health, and the social sciences. Of particular interest are applications of algorithms, models, and discrete mathematics to critical problems of society, including homeland security, energy, climate change, health care, and the economy.

DIMACS's programs foster research, education, outreach, and integration of research and education. The signature activity of DIMACS is our special focus, programs: multi-year programs addressing a broad, important topic with many specific areas of interest, and involving hundreds of participants from all over the US and around the world. Other activities include faculty-led research projects, undergraduate research, high-school curriculum development, and international programs.

DIMACS's programs are carried out with the aid of more than 300 scientists from the collaborating institutions who form the permanent members of the Center, plus a large number of senior and junior scientists from other academic institutions and industry and government, as well as postdoctoral fellows and graduate students. The principal administrative offices are located at Rutgers University's Busch campus in Piscataway, NJ. DIMACS is also home to the Command, Control, and Interoperability Center for Advanced Data Analysis (CCICADA), a Department of Homeland Security University Center of Excellence.

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