

# **ASNE Day 2016**

**Engineering America's Maritime  
Dominance**

**Arlington, Virginia, USA  
2 - 3 March 2016**

**ISBN: 978-1-5108-2781-3**

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2016) by the American Society of Naval Engineers  
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact the American Society of Naval Engineers  
at the address below.

American Society of Naval Engineers  
1452 Duke Street  
Alexandria, Virginia 22314

Phone: (703) 836-6727  
Fax: (703) 836-7491

[asnehq@navalengineers.org](mailto:asnehq@navalengineers.org)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2634  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

<b>Shipboard Automatic Watchstander .....</b>	1
<i>G. Bredariol, J. Donnal, W. Cotta, S. Leeb</i>	
<b>Ultra-Safe Enclosure for Storage of Large Format Li-Ion Batteries.....</b>	9
<i>T. Carriere, M. Hageman, M. Tomlinson, S. Bernier</i>	
<b>Revitalizing Shipboard PMS Out with the MIP, in with the APP .....</b>	19
<i>J. Cordle</i>	
<b>Future Trends in Naval Applications: Democratization of Innovation.....</b>	23
<i>T.E. Coursey, L.M. Hamburg</i>	
<b>Computational Research Engineering Acquisition Tools and Environments: A Key Enabler for a Paradigm Shift in Defense Acquisition and Sustainment.....</b>	31
<i>E. Kraft</i>	
<b>Ballistic Missile Defense - Expanding the Aegis Combat System Fighting Capability .....</b>	48
<i>K.L. Englander</i>	
<b>ASNE Panel: Surface Navy Advances in Warfighting.....</b>	58
<i>T. Druggan, M. Ladner, J. Lowery, G. Thomas</i>	
<b>A Design for Maintaining Maritime Superiority .....</b>	68
<i>N/A</i>	
<b>Corrosion and Mechanical Evaluation of Coatings for CuNi Piping .....</b>	86
<i>V.G. DeGiorgi, S.A. Policastro, C.R. Feng, R.W. Fonda</i>	
<b>Framework for Analyzing Modular, Adaptable, and Flexible Surface Combatants .....</b>	94
<i>N. Doerry</i>	
<b>Flexible Ships Panel: Enabling Full Implementation .....</b>	106
<i>M.R. Good</i>	
<b>Future Programs: 30 Year Plans - Surface Navy Combat Power .....</b>	111
<i>J.A. Hill</i>	
<b>MVDC Specs and Standards Design Tools.....</b>	124
<i>N. Doerry</i>	
<b>Advanced Computational Tools for Ship Design and Analysis: Moderator's Comments - Computational Research Engineering Acquisition Tools and Environments.....</b>	129
<i>N/A</i>	
<b>"Quart in a Pint Pot" German Flexible Force Multiplication of Compact Fighting Ships with MEKO® Modularity from Thyssenkrupp Marine Systems .....</b>	133
<i>J. Kameran</i>	
<b>Building and Modernizing Affordable Warships with Modular SWAP-C Compartments .....</b>	149
<i>N. Manquis</i>	
<b>International Panel Flexible Ships Design .....</b>	159
<i>K.G. Christiansen</i>	
<b>Cost of Cyber .....</b>	166
<i>N/A</i>	
<b>Integration of Large Pulsed Loads into a Naval Power System Testbed .....</b>	173
<i>J. Herbst, R. Hebner, S. Pish, S. Strank, J. Hahne</i>	
<b>An Overview of the Use of Thermoplastic Compounds.....</b>	181
<i>R. Holder</i>	
<b>Student Keynote Session: "How to Get Published" .....</b>	188
<i>F. DeBord, E.M. Golda, M. Nate</i>	
<b>Energetics Renaissance for Future Combat Systems.....</b>	193
<i>A. Johnson, C. Gotzmer</i>	
<b>An Adaptable, Fail-Safe, Shock and Vibration Isolation Mount for Submarine Missile Launch Systems .....</b>	197
<i>B. Kavlicoglu</i>	
<b>An Advanced Forward Closure System (FCS).....</b>	207
<i>B. Kavlicoglu</i>	
<b>Designing Out Complexity Early: A Path to Flexible Warships .....</b>	215
<i>R.G. Keane, T.S. Mierzwicki, G.R. Grogan</i>	
<b>Additive Manufacturing in Compliance with Lean Shipbuilding.....</b>	222
<i>D. Kolich, R.L. Storch, N. Fafandjel</i>	

<b>A Next Generation Integrated Power System for Legacy Naval Platforms</b>	234
<i>L. Kondor</i>	
<b>Hybrid Energy Storage Module for Large-Scale Ship Pulsed Power</b>	238
<i>S. Kuznetsov</i>	
<b>Leveraging Additive Manufacturing in Product Design</b>	243
<i>D. Marjadi</i>	
<b>Damage Control and Recoverability Simulations in Support of the Future Frigate</b>	255
<i>K. Murray, J.A. Waltham-Sajdak</i>	
<b>Towards Resilient Unmanned Maritime Systems</b>	266
<i>A. Nuss, T. Blackburn, A. Garstenauer</i>	
<b>Ohio Replacement Program</b>	275
<i>M. Jabaley</i>	
<b>Program Update: American Society of Naval Engineers</b>	289
<i>B.K. Antonio</i>	
<b>Engineering for Maritime Dominance</b>	293
<i>C. Becker</i>	
<b>Heterogeneous Networked Systems in a ROS-Enabled Cloud Environment</b>	295
<i>C. Reid, B. Samanta, C. Kadlec</i>	
<b>Analyzing and Forecasting Overhead Costs in U.S. Naval Shipbuilding</b>	303
<i>J. Rogal, A. Tase, R. Lockett, P. Koenig</i>	
<b>Lessons for Technology Transition</b>	310
<i>B. Clark</i>	
<b>American Society of Naval Engineers: Science &amp; Technology in Support of Future Programs</b>	314
<i>S.G. Gambhir</i>	
<b>Development in the Laboratory Enterprise</b>	319
<i>N/A</i>	
<b>American Society of Naval Engineers: S&amp;T Investments Driving Future Naval Capabilities</b>	322
<i>M. Winter</i>	
<b>Use of Integrated Recoverability Model to Assess Network Vulnerability to Cyber Attack</b>	326
<i>S.D. Woods</i>	
<b>The Design Process as a Complex System</b>	337
<i>C.P.F. Shields, J. Knight, D.J. Singer</i>	
<b>Modeling the AEGIS Waterfront Workforce Requirements to Effectively Plan for the Future</b>	349
<i>J. Smith, S. Dy, T. Voth, B. McLaughlin</i>	
<b>Technical Authority in a Dynamic Environment</b>	354
<i>B. Fuller</i>	
<b>Bending the DoD Energy Consumption Curve with Big Data Analytics</b>	364
<i>T. Litwin, M. Weatherly</i>	
<b>Young Professionals Track Redefining Success Challenge Project: Agents for Change</b>	378
<i>J. Lin, L. Paredes, G. Grogan</i>	
<b>Author Index</b>	