

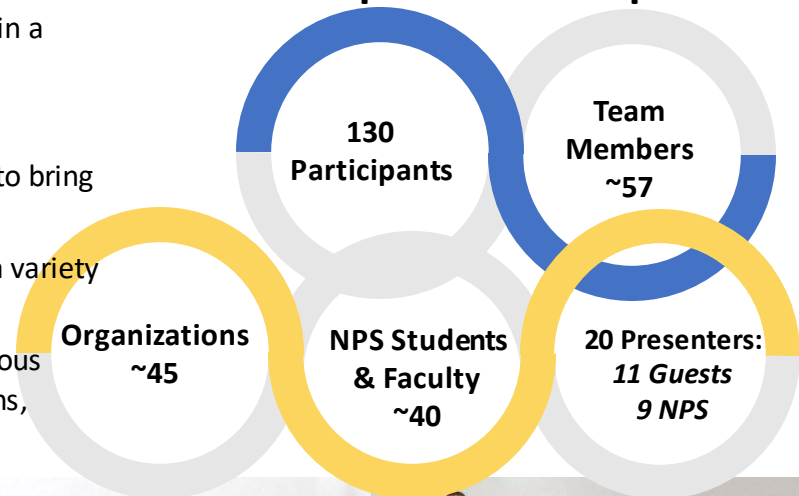
WARFARE INNOVATION CONTINUUM WORKSHOP LOGISTICS IN CONTESTED ENVIRONMENTS

September 2019 WIC Workshop Quick Look Report

HIGHLIGHTS:

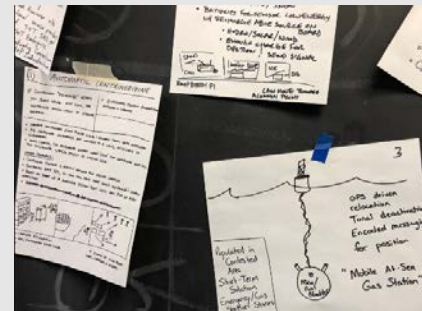
- Largest workshop to date with 130 active participants in a variety of roles
- High level leadership participation throughout
- Team members from both Australia and New Zealand to bring partner nation perspectives
- Industry representatives throughout the workshop in a variety of roles
- Technologies and concepts proposed include autonomous ship-to-shore systems, resilient communication systems, undersea logistics, and more

WIC Workshop 2019 Participation:



Event Description *From Technical to Ethical...From Concept Generation to Experimentation...*

The annual Naval Postgraduate School Warfare Innovation Continuum (WIC) Workshop is an innovation engine leveraging our strength – our operational experienced students and defense oriented faculty – to address complex fleet issues and discover opportunities available through emerging technologies. In just three and a half days, diverse teams of early career engineers from industry, Navy labs, and academia with junior officers from NPS and other commands are facilitated through a rapid concept generation process to craft concepts of employment and risk assessments within a future conflict scenario. Teams brief their best three or four concepts to sponsors, industry executives, and senior officers and results are further disseminated to the technical community, fleet commands, and OPNAV staff.

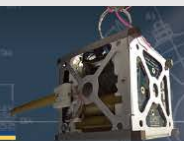


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CRUSER

Consortium for Robotics and Unmanned Systems Education and Research +



FROM TECHNICAL TO ETHICAL... FROM CONCEPT GENERATION TO EXPERIMENTATION...

WARFARE INNOVATION CONTINUUM WORKSHOP LOGISTICS IN CONTESTED ENVIRONMENTS

WIC Workshop 2019 Selected Concepts

Seven teams worked the design challenge and at the end of two and a half days of facilitated concept generation presented over 20 concepts to support logistics in a contested environment. The following are the selected concepts for further development:

Assured Comms and Navigation: *cross-domain system of assets that requires ad hoc network for comms and navigation*

- **Attritable Comm / Log System:** current logistics distribution and resupply systems
- **Starry Night System:** SEASTAR UAV suite and Sea Kelp modular delivery system deployed in tandem leveraging celestial navigation

Business Use Case: *organizational solutions that may require cost-benefit analysis, policy revision or development, or other business process*

- **Logistics Force:** four star COCOM with funding from National Budget
- **MilMart:** an Amazon Marketplace for the logistics supply officer
- **S.S. King's Point:** reinvigorate the Merchant Marines through public private partnerships
- **Landing Ship Expeditionary (LSX):** to mirror the LSTs of WWII

Ship to Shore Delivery: *concepts that aide the delivery of supplies from ship to shore*

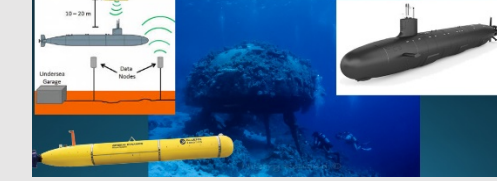
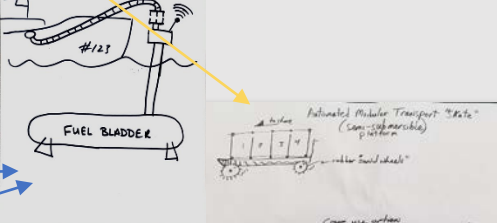
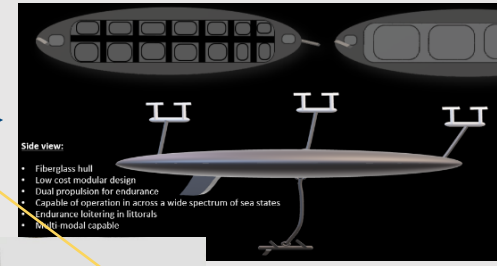
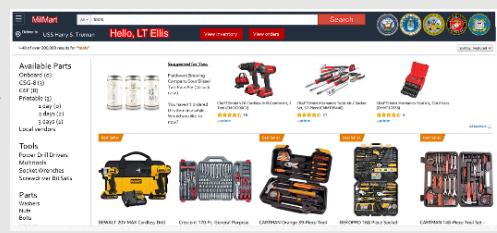
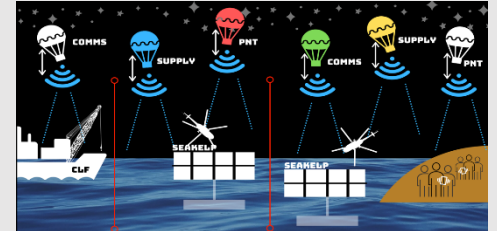
- **Sea Kelp:** modular delivery system
- **ACDC:** Autonomous Container Delivery Craft
- **PEA-PODS:** Prepackaged Expeditionary Autonomous Precision Overboard Distribution System
- **ROOMBA:** Remote Operated Overboard Mobile Boxes Ashore

Undersea Infrastructure: *development of the undersea infrastructure to support logistics*

- **ATLANTIS:** Automated Theatre Logistics Arsenal Naval Tactical Integrated System
- **Forward Deployed Fuel Bladder:** submersible

Concept Development: *logistics support concepts in process that may warrant modification and further development*

- **Forward Deployed Fuel Bladder:** submersible
- **STEAL:** Surreptitious Tactical Expeditionary Alternate Acquisition Logistics
- **Starry Night System:** SEASTAR UAV suite and Sea Kelp modular delivery system deployed in tandem leveraging celestial navigation





WARFARE INNOVATION CONTINUUM WORKSHOP

LOGISTICS IN CONTESTED ENVIRONMENTS

WIC Workshop 2019 Schedule

MON – 23 September

0800	Registration	GLASGOW 102
0830	Welcome	Dr. Steven Lerman, NPS Provost
0845	NPS Warfare Innovation Continuum & Scenario	CAPT Jeff Kline USN (ret), NPS Professor of Practice Operations Research
0915	<i>Focusing Logistics Outcomes</i>	CAPT Eric Morgan USN, OPNAV N4i Logistics Analytics Branch (LAB)
0940	<i>Afloat Subsistence Operations</i>	CDR Chris O'Connor USN, USFF Fleet Services Officer
1005	<i>Challenges for Joint Logistics in the Indo-Pacific</i>	Mr. Kawa Amina, USINDOPACOM J46X
1030	BREAK	
1100	<i>Post Supply Chain Logistics Decisions</i>	Dr. Ken Doerr, NPS Associate Professor Graduate School of Defense Management
1125	Team Introductions	Ms. Lyla Englehorn, NPS CRUSER Associate Director
1145	LUNCH	
1300	<i>Global Logistics Challenges</i>	Ms. Merritt Baer, AWS Global Accounts Principal Security Architect
1325	<i>Developing Technology Case Study: Counter-Drone Technology</i>	Mr. Jamie Hyneman, M5 Industries Founder
1350	<i>NPS Total Ship Systems Engineering</i>	LT Christopher Girouard USN, NPS TSSE Student
1415	<i>Innovation in a Data-Driven Environment</i>	Dr. Maura Sullivan, FATHOM5 Founder & COO
1440	Tasking	CAPT Jeff Kline USN (ret), NPS OR
1500	Initial Team Meetings	BREAKOUT ROOMS
1600	Icebreaker	TRIDENT ROOM

TUES – 24 September

0800	Welcome	Dr. Brian Bingham, NPS CRUSER Director
0810	<i>Emerging Technology Inject</i>	Mr. Mike Tall, NIWC Pacific
0835	<i>Developing Technology Case Study: Elroy Air, Autonomous VTOL Aerial Logistics</i>	Mr. David Merrill, CEO Elroy Air and Capt. Alex Preston USMC, NPS
0900	Process	Ms. Lyla Englehorn, NPS CRUSER
1000	Discovery Interviews – Mentors	BREAKOUT ROOMS –meet in Glasgow Courtyard
1000	PARALLEL Follow on briefs	STBL B18
1130	Concept Generation – Divergent	BREAKOUT ROOMS
1200	BROWN BAG SEMINAR: <i>Somewhere over the RAINBOW:' Considering the Pacific Campaign and the Global Context of the Second World War</i>	Dr. David Kohnen, Naval War College John B. Hattendorf Center for Maritime Historical Research Director
1300	Concept Generation – Divergent to Convergent	BREAKOUT ROOMS
	Innovation Enterprise Discussion –Mentors	GLASGOW 102



WARFARE INNOVATION CONTINUUM WORKSHOP LOGISTICS IN CONTESTED ENVIRONMENTS

WIC Workshop 2019 Schedule (continued)

WED – 25 September

- 0800 Welcome
- 0810 *Accelerating Unmanned Logistics*
- 0835 *Logistics & Future Warfare*
- 0900 *From Concept Generation to Experimentation*
- 0925 *'Logistics - What is that!' Winston S. Churchill, Admiral Ernest J. King, and the Allied Battle of Combined Command in the Second World War*
- 1000 Concept Generation – **Convergent**
Lab Tour – Mentors
- 1030 Directors & Chairs Rotation
- 1200 **LUNCH**
- 1300 Concept Development – **Final Push**
- 1500 PARALLEL Final Concept Presentation**

GLASGOW 102

- Mr. Carl Oros, NPS CRUSER Associate Director
- CAPT George Galdorisi USN (ret), NIWC Pacific
- Professor William Glenney, Naval War College Institute for Future Warfare Studies
- Dr. Raymond Buettner, NPS FX Director
- Dr. David Kohnen, Naval War College John B. Hattendorf Center for Maritime Historical Research Director

BREAKOUT ROOMS

departs @1000 from GLASGOW 102

BREAKOUT ROOMS

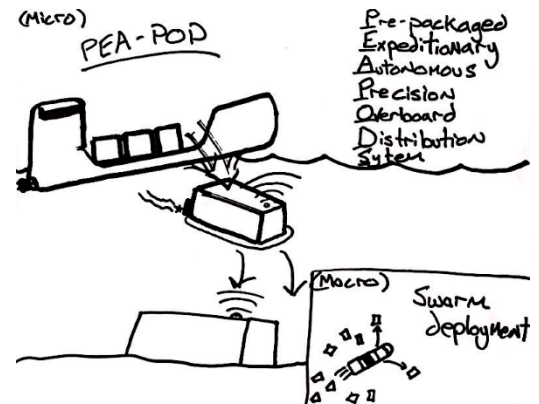
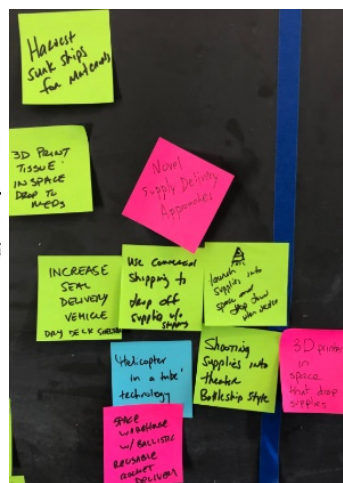
BREAKOUT ROOMS

STBL B18

THUR – 26 September

- 0800 Team Photos & Evaluation
- 0830 Final Briefs
- 1200 **ADJOURN**

GLASGOW 102





CRUSER Overview *From Technical to Ethical...From Concept Generation to Experimentation...*

At the direction of the Secretary of the Navy, the Naval Postgraduate School (NPS) leverages its long-standing experience and expertise in the research and education of robotics and unmanned systems to support the Navy's mission. The Consortium for Robotics and Unmanned Systems Education and Research (CRUSER) serves as a vehicle to align research efforts and integrate academic courses across discipline boundaries. Established by the Under Secretary of the Navy in 2011, CRUSER is an initiative designed to build an inclusive community of interest around the application of unmanned systems in naval operations. With the operational needs of the Navy and the Marine Corps at its core, CRUSER is an inclusive, active partner for the effective education of future military leaders and decision makers.

CRUSER seeks to capitalize efforts, both internal and external to NPS, by facilitating active means of collaboration, providing a portal for information exchange among researchers and educators with collaborative interests, fostering innovation through directed programs of operational experimentation, and supporting the development of an array of educational ventures. Annually, CRUSER conducts concept generation workshops for naval missions and hosts technical symposia to address naval missions, and field experimentation to test selected technologies.

WIC Workshop 2019 Key Take Away Message



Team Osiris, SEP 2019

"Hands down it is the type of event early career scientists and engineers should participate in!" – Ms. George Campbell, an early career scientist at NIWC Atlantic who served on a concept generation team, September 2019



Team Peko, SEP 2019



A full workshop report will be posted on the CRUSER website (cruser.nps.edu) at the beginning of November 2019.

