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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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
- **STEAAL**: Surreptitious Tactical Expeditionary Alternate Acquisition Logistics
- **Starry Night System**: SEASTAR UAV suite and Sea Kelp modular delivery system deployed in tandem leveraging celestial navigation
WIC Workshop 2019 Schedule

MON – 23 September

0800  Registration
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  Focusing Logistics Outcomes  CAPT Eric Morgan USN, OPNAV N4i Logistics Analytics Branch (LAB)
0940  Afloat Subsistence Operations  CDR Chris O’Connor USN, USFF Fleet Services Officer
1005  Challenges for Joint Logistics in the Indo-Pacific  Mr. Kawa Amina, USINDOPACOM J46X
1030  BREAK
1100  Post Supply Chain Logistics Decisions  Dr. Ken Doerr, NPS Associate Professor Graduate School of Defense Management
1125  Team Introductions  Ms. Lyla Englehorn, NPS CRUSER Associate Director
1145  LUNCH
1300  Global Logistics Challenges  Ms. Merritt Baer, AWS Global Accounts Principal Security Architect
1325  Developing Technology Case Study: Counter-Drone Technology  Mr. Jamie Hyneman, M5 Industries Founder
1350  NPS Total Ship Systems Engineering  LT Christopher Girouard USN, NPS TSSE Student
1415  Innovation in a Data-Driven Environment  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  Emerging Technology Inject  Mr. Mike Tall, NIWC Pacific
0835  Developing Technology Case Study: Elroy Air, Autonomous VTOL Aerial Logistics  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: Somewhere over the RAINBOW: ‘Considering the Pacific Campaign and the Global Context of the Second World War  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
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 departs @1000 from GLASGOW 102
1030 Directors & Chairs Rotation

1200 LUNCH
1300 Concept Development – Final Push

1500 **PARALLEL** Final Concept Presentation

**THUR – 26 September**

0800 Team Photos & Evaluation
0830 Final Briefs
1200 ADJOURN

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**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
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.

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