

Ribbon Cutting Officially Opens New Submarine Innovation Lab

By Lt. Tia Nichole McMillen, Submarine Force Pacific Public Affairs

Rear Adm. Frederick “Fritz” J. Roegge, Commander, Submarine Force, U.S. Pacific Fleet (CSP), joined industry partners to cut the ribbon officially opening the CSP Innovation Lab (iLab), Nov. 7.

Roegge announced the opening of the CSP iLab at Naval Submarine Training Center Pacific (NSTCP). The CSP iLab is an unclassified space created to allow submarine sailors to prototype Virtual Reality (VR) and Augmented Reality (AR) technologies to generate ideas for low-cost solutions to fleet training and operational challenges. Squadron commodores and unit commanding officers are highly encouraged to send their sailors to the CSP iLab to:

See cutting-edge VR/AR technologies

Share ideas for using VR/AR onboard submarines

Shape the future of submarine training, operations, and maintenance

“It’s imperative that we create an innovative space for our personnel to identify, research, and use emerging technologies to address the Navy’s most pressing challenges,” said Roegge at the ribbon cutting ceremony.

The iLab’s mission is to exploit and leverage commercial sector research and tools from the computer gaming industry and cellular phone markets to explore the latest technologies.

“This emerging maker-space is where submariners can prototype low-cost solutions to training and operational problems using cutting edge virtual reality and augmented reality tools,” said



PEARL HARBOR, Hawaii (Nov. 7, 2016) Rear Adm. Fritz Roegge, commander, Submarine Force U.S. Pacific Fleet (COMSUBPAC), cuts a ribbon to officially open the COMSUBPAC Innovation Lab (iLab) at Naval Submarine Training Center Pacific in Joint Base Pearl Harbor-Hickam, Nov. 7. The iLab’s mission provides Sailors with cutting-edge battlespace visualization capabilities using virtual and augmented reality. (U.S. Navy photo by Petty Officer 2nd Class Michael H. Lee/Released)

Roegge. “To achieve high velocity learning, we must expand the use of learning-centered technologies and put them in the hands of our greatest asset: our sailors. Our sailors are the ones closest to the problems, and therefore the ones best positioned to come up with innovative ideas for their solution.”

The CSP iLab supports the Commander Pacific Fleet (CPF) Bridge initiative, Chief of Naval Operation’s “High Velocity Learning,” and Secretary of the Navy’s “Innovation Vision Elements.” The iLab is outfitted and operated in partnership with the Space and Naval Warfare Systems Command (SPAWAR), Battlefield Exploitation of Mixed Reality (BEMR) Lab and the Naval Sea Systems Command (NAVSEA) New Training Technologies Program Office.



PEARL HARBOR, Hawaii (Nov. 7, 2016) Rear Adm. Fritz Roegge, commander, Submarine Force U.S. Pacific Fleet (COMSUBPAC), addresses guests during a ribbon-cutting ceremony to officially open the COMSUBPAC Innovation Lab (iLab) at Naval Submarine Training Center Pacific in Joint Base Pearl Harbor-Hickam, Nov. 7. The iLab's mission provides Sailors with cutting-edge battlespace visualization capabilities using virtual and augmented reality. (U.S. Navy photo by Petty Officer 2nd Class Michael H. Lee/Released)

“The capabilities of the Navy need to consistently move forward,” said Chief Petty Officer Craig McHenry, Naval Submarine Training Center Pacific facilities manager. “There is so much knowledge out there that we must understand and use to our tactical and operational advantage. The iLab is a tool our sailors can use to unlock that ability and capitalize on our findings.”

Commander, Submarine Force, U.S. Pacific Fleet has also established a relationship with the University of Hawaii’s Applied Research Laboratory (ARL) and the Laboratory for Advanced Visualization and Applications (LAVA). These and other key partners will add new

demonstrations and assist submarine sailors in building tailored applications based on the ideas received.

“The command is embracing the capabilities of the future and attempting to use these capabilities to its advantage,” said McHenry. “High velocity learning, as exemplified by our iLab, can only make our military and civilian team stronger and smarter. I’m proud to serve on this team, and I’m excited to see where we take this technology in the future.”

The iLab needs submarine sailors of all ranks and career fields to observe the technologies and generate ideas for their use. Ideas, both bold and modest, will be captured via log books or email; an iLab Idea Board will review the proposals for further development. The goal of the CSP iLab is to rapidly transition cutting-edge technology ideas, generated by the sailor, to the waterfront.

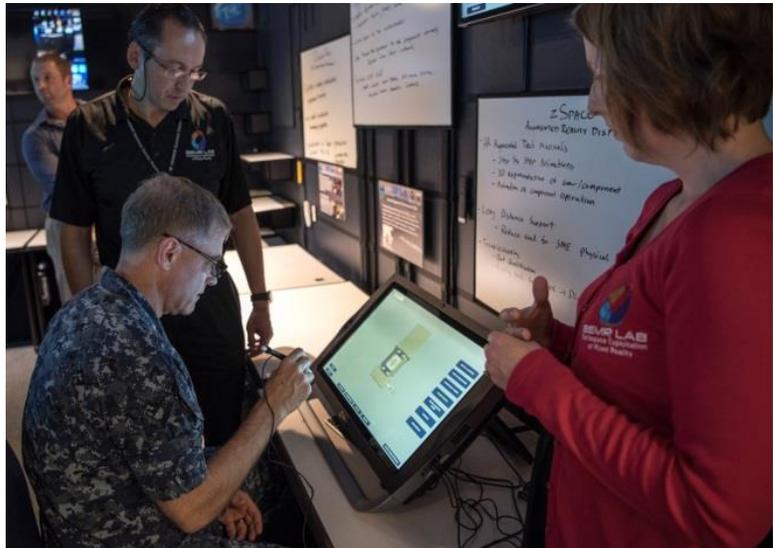
“The iLab is a breakthrough initiative to present transformative tools to the submarine force and gather input to rapidly improve shipboard learning technologies,” said Capt. Erik Burian, COMSUBPAC director for training, doctrine, and tactical development.

Current iLab Capabilities:

OceanLens. OceanLens is like Google Earth for the undersea environment, viewed via an Oculus Rift Virtual Reality headset. It includes a 3D immersive environment for visualizing undersea topography (bathymetric data). Some ideas for use include drive-through or swim-through waterspace visualization with bathymetric features, assigned waterspace for ships, adjacent waterspace assigned to other submarines, and stay out/warning areas. Higher resolution bathymetric data could be used for planning and rehearsal of near or on-shore missions.

zSpace 3D Maintenance. zSpace allows sailors to interact with a 3D display using stereoscopic glasses and a special pen. Sailors can easily practice virtual maintenance activities on any modeled equipment. The glasses have head tracking which allows sailors to view equipment from all sides. They can virtually disassemble and reassemble equipment, shift to an exploded view of all sub-components, and make equipment housing transparent so they can easily view interior parts. Also available in the iLab is an iPad-based demonstration of a 3D printed Woodward Governor diesel control. The interactive training virtualizes the operations, maintenance procedures, instructional videos required to install, remove and start-up a diesel generator using a Woodward Governor.

Eagle 360 Piloting Brief. The Eagle 360 capability used a 3D printed mount with 7 GoPro cameras to capture a 360 video of every submarine route into and out of Pearl Harbor. Eagle 360 includes a drive-through view of actual Pearl Harbor port entry conditions, close-up views of navigation aids, buoys and natural features, along with a reduced visibility/night simulation. The goal is to establish a library of 360 piloting briefs for every submarine port. When this library is onboard every submarine, it will allow a piloting party and bridge party to essentially make the port entry prior to actually going there. Submarine crews will be able to gain experience, improve safety, and reduce risks caused by unfamiliarity or confusion at new ports.



PEARL HARBOR, Hawaii (Nov. 7, 2016) Rear Adm. Fritz Roegge, commander, Submarine Force U.S. Pacific Fleet (COMSUBPAC), participates in an augmented-reality demonstration at the official opening of the COMSUBPAC Innovation Lab (iLab) at Naval Submarine Training Center Pacific in Joint Base Pearl Harbor-Hickam, Nov. 7. The iLab's mission is to provide Sailors with cutting-edge battlespace visualization capabilities using virtual and augmented reality. (U.S. Navy photo by Petty Officer 2nd Class Michael H. Lee/Released)

HoloLens 3D Immersive Walk-Through. Using the Microsoft HoloLens Augmented Reality headset sailors can virtually experience how to move within and through a holographic model floating in the iLab. Holograms can include any object from the real world, ranging from running engines, commercial aircraft, or military submarines. These holograms allow the sailor to experience being there without physically being there. Some uses include training for new crewmembers at submarine school to shorten the time to become familiar with the layout of their new submarine, training firefighters who may not have regular access to all compartments in a submarine, and visualizing maintenance issues such as interference removal for planning. The submarine’s officer of the deck could use the HoloLens and OceanLens together to “see through” the hull of the submarine for more intuitive situational awareness of the increasingly complex undersea environment, including contacts, bottom topography, wave propagation, contacts, and unmanned systems. The HoloLens has Skype capability so that a distant expert can see through the eyes of the sailor and coach them through maintenance, operations or inspections in real-time. For example, several sailors put together a physical valve/galvanized pipe assembly in the iLab by getting coaching from a remote expert via Skype on HoloLens. Hands-free on-demand support can both improve the response time to sailors that need assistance and lighten the burden on technical representatives by reducing airline flights, cost, time and fatigue from traveling.

360 Video Capture/Replay. Sailors can leverage 360 degree video for immersive capture of submarine training and maintenance events. They can easily record “what right looks like” and then share best practices with other sailors. Recent technologies available in the iLab allow rapid transfer of 360 video to a commercial smart phone/goggle using a simple app. No special stitching is needed before a sailor can review the event as if they were there. Recently, a sailor used the iLab’s Samsung Gear360 video camera to capture short events and then made them available for viewing on a smart phone/goggle in about five minutes.

Ideas can always be submitted to CSPiLab@navy.mil or CSPiLab@navy.smil.mil. There will be quarterly iLab Idea Boards conducted at CSP beginning in December. The top ideas that emerge will be prioritized by CSP leadership and pushed forward.

For more news from the Pacific Submarine Force, visit www.csp.navy.mil.