

# Save the Ship

The US Navy's Battle Stations 21 is the new capstone of sailor boot camp training – the ultimate “all nighter” designed to immerse recruits in the high-anxiety scenario of a combat encounter at sea. It looks, feels, and even smells like the real thing. **Rick Adams** reports on this and some other naval training projects.

Image credit: US Navy/NSTC



**Y**ou only have to know that the 17 sailors who died in the surprise attack on the USS Cole seven years ago were all junior personnel to realize the need for the training now being provided by the Battle Stations 21 facility at Naval Station Great Lakes. When you are 18 years old, traversing hostile waters, and your ship takes a missile hit for the first time, you'd better have a pretty good idea how you're going to deal with the debris, the fire and smoke, the cacophony of barked orders and unusual noises, the injured and dying shipmates, and a chaos you've never experienced nor could even imagine.

Since mid-year, newly capped sailors will, for the first time, have gone through an experience akin to combat at sea, and the stress is so realistic some even chatter to the quite-lifelike manikins used to simulate casualties.

The US\$82 million Battle Stations 21 is the US Navy's newest showpiece. The SecNav has toured it. So has the CNO. Congressmen. Representatives of more than a dozen other countries. Television reporters. Even building construction magazine editors. Seems like everyone wants to see the much-ballyhooed "Disneyland on Lake Michigan."

Battle Stations 21 is an ingenious combination of an "event-based" approach to training and the magic mirrors techniques Hollywood uses to immerse theater-goers and theme park thrill-seekers into believing they're in the middle of the action. But in this case, the purpose is not to elicit a "Let's ride again" response, it's to evaluate whether a sailor candidate is ready to save his ship in a crisis situation.

If you've not yet heard about it, Battle Stations 21 is a mock Arleigh Burke-class destroyer, commissioned as the USS Trayer (BST 21), located inside a 157,000-square-foot structure. It not only looks like a ship, it rests in 90,000 gallons of water that smells like the Atlantic Ocean. Quite likely the world's largest simulator, the 200-foot long and 54-foot high Trayer represents the final exam of the newbie's two-month boot camp.

A 12-hour sequence of scenarios is held on the final night of training – after the almost-sailors have already put in more than a full day. By the time they're done, they'll have been awake more than 30 hours... and those final few are by far the most stressful. While routinely cruising back toward Norfolk from Yorktown in the middle of the night, the Trayer is fired on. The first missile whizzes by, but the next two strike the officer's mess, and all hell literally breaks loose. The deck collapses into a berthing area. Fires blaze. Pipes burst and compartments start to fill with water.



A 12-hour sequence of scenarios is held on the final night of training.

Image credit: US Navy/NSTC.

Trainees must navigate the tangled wreckage and check the berths for survivors. They'll encounter a number of "Randykins" – full-size and weight manikins with recruit-style haircuts and clothing – some of which elicit moans and screams of pain via an embedded MP3 player. Some of the manikins are, disarmingly, "dead." Other students are donning fire gear and manning hoses, while some are even practicing emergency egress.

BST 21 can accommodate 415 people (four divisions of 88, or 352 trainees, plus 63 facilitators) in a single drill, a logistics task that challenged design/build contractor McHugh Training & Simulation as much as the faux ship and special effects. Senior project manager Sheila Sheridan says they first developed a "human management" computer model with 352 dots and so much space around each dot. After a throughput exercise, "a lot of dimensions had to change." Doors were widened, for example, and stairwells shifted to facilitate movement of groups of 11 during the training scenario.

McHugh also designed in duplicates of key locations – four identical fire rooms, 16 flooding compartments. "The team had to come up with the most effective way to get through this. We had to build the maze."

To monitor recruit actions against training objectives and help control the action, facilitators use wireless PDAs with time clocks and voice over IP software. They simply tap on the person's name and record what was done or not done, then use the data during debrief to review with the student. Every room in the Trayer is equipped with closed circuit TV, both for



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safety during the drills and for after-action discussion.

Some of the low-tech solutions the McHugh team developed are essential ingredients in creating the at-sea sensation. The pipe burst spraying in the sailors' eyes is fresh water spiced with four different scent cubes to make it seem like brine. Flood scenarios and the gravity of subtly sloping floors draw water from the moat around the ship, then filter and drain it back through a trench. An ozone and ionization system precludes the need for chlorine so the "ocean" won't smell like a swimming pool. Oversize coils into the heating system quickly spike the temperature. Shakers under the floor replicate the jolt of a missile hit. Some of the window-



**BST 21 can accommodate 415 people in a single drill.**

Image credit: US Navy/NSTC

dressing details (junction boxes, light fixtures, conduit) were salvaged from three decommissioned ships.

A few years back, I witnessed the Navy's reaction to a genuine crisis when the aircraft carrier I was aboard had a flash fire event and an apparent man overboard in the Pacific. Fortunately the fire was doused quickly and the only thing overboard was a flak vest. What was truly impressive was the discipline with which they mustered every one of the 5500 people to their assigned stations.

### Beyond Great Lakes

There are, of course, numerous other naval training programs out of the glare of the Battle Stations 21 spotlight. Here's a sampling:

**High-speed craft handling** – MarineSafety International has certified a uniformed US Navy crew and is about to complete certification for a civilian Navy crew to operate the "Swift" wave-piercing high-speed catamaran built by Incat in Tasmania. MSI director of business development Brian Boyce says the 320-foot vessel can reach speeds around 50 knots, and has a bridge "more like an airplane cockpit" with only two or three operators. MSI uses a Swift bridge mockup surrounded by a 360-degree wrap-around visual. At high speeds, piloting the craft requires heightened situational awareness and a narrower, cone-like focus compared to slower ships. "At that size and that speed, things happen fast."

**P-3 Level D Prototype** – CAE has delivered a P-3 Orion operational flight trainer upgrade to NAS Jacksonville, Florida, which incorporates the Genesis RT worldwide "on the fly" database from Diamond Visionics. According to DV founding partner Dave Gdovin, the customer is "loving it." The new system includes 53 high-resolution databases around the world, enabling pilots to navigate from one to another without having to fly through hours of "clouds" between gaming areas.

**USMMA Goes Darker** – The US Merchant Marine has a new nighttime capability in its ship bridge trainer, courtesy of small business Display Solutions. They replaced 11 single-chip XGA projectors with three-chip SXGA+ Titan projectors from Digital Projection. 3D Perception added video warping and edge-blending post processors. The adjustable lens iris of the new projectors, combined with custom optical baffles, are said to improve the night scene performance of the simulator.

Display Solutions and 3D Perception also upgraded the visual systems for three ship bridge simulators at the Arab Academy of Science and Technology in Alexandria, Egypt. **MST**



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