

Taming

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When the same shipboard machinery that transports chicken wings is capable of ripping off someone's head, there's a problem—for the Sailors operating that machinery, as well as for the engineers responsible for modifying it. The trail of blood from Sailors maimed or killed by vertical-package conveyors, however, may be coming to an end, thanks to engineers at NavSea Philadelphia.

For 17 years, officials here have played the major role in the machinery alterations (MachAlt) program. The efficiency and speed at which they provide instructions and hardware for alterations on flawed equipment literally become a matter of life and death. Depending on the funding priorities for each ship class, a modification then can take years to be approved and installed aboard all ships of the affected class.

NavSea got involved with vertical-package conveyors a couple of years ago when an engineer happened to recognize blood on a conveyor aboard a ship he was inspecting. After learning what had happened, he decided something needed to be done. He created a prototype safety tray that allowed the steel tines (fingers) of the conveyor to be hinged to swing upward (all recorded deaths have occurred when the conveyor trays were going in a downward motion). An accompanying spring mechanism prevents the tines from staying in an upright position.

Conveyor trays currently have the tines rigidly attached to drive chains. The tines usually catch an object between the bottom tray and the load/unload device. If the object is solid enough, it will jam the drive mechanism or bend the tines



and snap the chains. If the object is softer, such as a person's head, the conveyor doesn't stop. Instead, it keeps moving with enough force to rip off the body part.

The NavSea engineer's prototype design eventually was patented Feb. 17, 1998. It then was tested aboard USS *George Washington* (CVN 73) and was developed into a preliminary engineering-change proposal. Because of a series of issues and delays, though, the new and improved conveyor tray never was approved for installation aboard ship.

According to the acting section head for the MachAlt program, "MachAlt is the cheapest, best and quickest method for installing the safety-conveyor trays, but that doesn't mean everything goes as planned." In late 1997, the tray made its debut at the MachAlt configuration control board, but the ships' platform managers wanted shipboard testing done (eventually the USS *George*

a Killer



The aircraft carrier USS *George Washington* (in the foreground) served as the test platform for a prototype safety tray in which the tines of a vertical-package conveyor are hinged to swing upward.

Washington prototype) before approving the fix. Because the MachAlt wasn't given a formal OK yet, the program was limited in what role it could assume, and, under previous supervision, it took a passive stance.

Policy deemed that people from life-cycle management and in-service engineering had to iron out all the engineering and testing before a MachAlt program manager would step into the game. This policy meant the technical community had to find the funding, solicit a ship for prototype, contract for the material and installation, develop testing criteria, and evaluate the design. Except for testing and evaluation, these requirements generally are unfamiliar ground for the technical community.

By the time all these steps were complete, none of the original players still were involved. Three section heads had rotated through MachAlt in quick succession. The originator also had taken a new billet. So when the testing was done, no one in the in-service engineering community notified the MachAlt office, and no one in the MachAlt office knew to be looking for test results from in-service engineering. In the meantime, the improved conveyor tray was shelved—temporarily.

“That’s how things used to work, but it really made a mess out of program management,” noted the acting Machalt section head. “We have changed our policy on how we deal with concepts now.” Instead of waiting and letting the technical

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community wade through channels to get a prototype aboard ship, the Technology Development Branch of NavSea in Philadelphia assumes the lead. With this system, development time for the new conveyor tray could have been cut by 18 months.

When the acting section head assumed his current responsibility, he reviewed all the minutes from past meetings of the configuration control board. Those minutes revealed that the safety-tray proposal had been deferred until shipboard testing was complete. He then sent a MachAlt program manager to find the project's originator and revive efforts to implement the safety tray. The program manager learned that the trays aboard USS *George Washington* had been operating for a lengthy period, with one unit recording no jams after moving 79,000 packages and the other unit having only one minor problem. The next step was to reconnect the technical community to the fleet.

The original preliminary engineering-change proposal was reworked for submission to the configuration control board. Because the ships' platform managers had to agree the testing was conclusive and the alteration worthwhile, the MachAlt program office contacted each manager and discussed the entire project, from concept to parts support once the alteration was installed.

The updated preliminary engineering-change proposal was approved April 26, 2000, for formal development. One question remained, though: Who would fund the effort? Flexibility in this

area is part of what has kept MachAlt going for 17 years. The program is authorized to receive funding from anyone—port engineers, type commanders, ships' platform managers, OpNav, or ships.

In some cases, this flexibility hinders NavSea Philadelphia. For example, since most MachAlt funding comes from

OpNav to do installations class-wide, the waterfront community gets the impression that MachAlts are done free, or at least no cost to them. So why ask the waterfront to pay for an issue like the safety tray? Because with the constant budget demands, it could take years to get funded by OpNav. In the meantime, more Sailors could get hurt or killed.

The most recent death occurred aboard an LHA, so the MachAlt program took the conveyor tray's funding issue to the LHA port engineers. Each was briefed on the costs, benefits and timetable for MachAlt installation, and they agreed to help. Before year's end, the safety trays will be going aboard LHAs and AOE 3, with more ships to follow.

The acting section head for the MachAlt program is glad the safety trays are going aboard ship, but he wishes installation had happened sooner. He points out that policy has been changed to speed up getting alterations to the fleet. "The last dozen MachAlts we've developed have an average time of six months from the writing of the preliminary engineering-change proposal to the time kits are fully developed."

Funding always will be an issue, but, according to the acting section head for the MachAlt program, "having these alterations ready to go quickly can only help." In the case of the conveyor safety tray, it's an alteration that couldn't be developed soon enough, but it now has the fast track. ☺

The author was a summer hire at NavSea Philadelphia, ShipSysEngSta, when she wrote this article. By now, she is back in classes at the University of Delaware.