Marines INNOVATE, CREATE *Solutions*

FOR THE FLIGHT LINE

By Jacquelyn Milham

U.S. Navy photo by Jacquelyn Milham

Brig. Gen. Allan Day, commander, Defense Logistics Agency Aviation, (center with hand raised) asks Lt. Col. Robert Sherwood, MALS-39 Commanding Officer (far left) and Col. Michael Moore, Marine Aircraft Group 39 Commanding Officer (left), about tail rotor blades maintenance procedures and component reliability as Col. Michael Borgschulte, Marine Aircraft Group 39's incoming Commanding Officer, Navy Capt. Rick Taylor, Commander, Naval Air Force Aviation Plans and Policy director, and Rear Adm. Paul Verrastro, commander, NAVSUP Weapon Systems Support, listen.

Marines from Marine Aviation Logistics Squadron (MALS) 39 shared their stories of how they improved operational readiness for H-1 U.S. Marine Corps Light Attack helicopter squadrons during a Boots on Ground (BoG) visit at Marine Corps Base Camp Pendleton, California, April 27.

BoG is a one-day visit by senior leadership and subject matter experts from the Naval Aviation Enterprise (NAE) used to discuss readiness and observe how junior Sailors and Marines are using continuous process improvement (CPI) to support readiness requirements.

"The projects presented today flow from the brief presented [to the Naval Aviation Enterprise Air Board]," said Vice Adm. Mike Shoemaker, commander, Naval Air Force. "It all ties together. The Marines are making our business better; it's impressive what they're doing."

One project involving innovative changes to helmet extension cables grabbed the attention of a multinational corporation.

A deficit of 83 H-1 cables—used to connect a pilot's heads-up display to the on-board computer—prompted maintainers to contact the original equipment manufacturer, French multinational corporation, Thales Group. The maintainers believed if they could get the instruction manuals, they could fix the broken cables and alleviate the shortage issue.

They received the manuals within a few weeks, "but they were all in French, and none of us spoke any French," said Cpl. Clayton Mantz, a microminiature electric cable repair technician who briefed BoG attendees.

Receiving the instructions in a foreign language was frustrating at first, but it didn't stop them. "We looked at the structure of the cable and how it was being used," Mantz said. "By reverse engineering it, we learned that the wires inside break when bent at a 90-degree angle, the position that is necessary when the cable is in use."

With approval from Fleet Support Team, the project resulted in an extension cable designed with a 90-degree angle. Maintainers reinforced the cable with a heavier gauged wire, and replaced the covering with metal-braided sleeves and snakeskin-style insulation. They also manufactured their own cabling boots—the covering at the end of the cable—with heat shrink available at the shop.

Since the new design, there is no longer an H-1 cable deficit. The solution has saved more than 1,000 man-hours and

has a ready-for-issue rate of 99 percent with a cost savings of more than $1 million over three years.

"We were so successful that Thales sent representatives to learn from us and duplicate our success," said Mantz.

Improving Readiness Degraders Top Priority

The helmet extension cable project was one of several shared during the BoG event that demonstrated how creative thinking was used to eliminate barriers and increase readiness.

Lt. Col. Robert Sherwood, MALS-39 Commanding Officer, said MALS-39 Marines continually analyze the causes of H-1's readiness degraders and seek ways to address those gaps at the intermediate-level repair facility. The command's logistic philosophy, he said, can be summed up in three words: establish, perfect and push.

First, address readiness gaps or reduce costs by establishing local repair capability. Then perfect, refine and optimize sustainable solutions. And third, push by sharing those solutions with others.

All of MALS-39 CPI efforts are a reflection of that philosophy, Sherwood said.

Another example deals with stub wings, the small wing-like structure found on each side of a helicopter that holds various weapons and missiles. The stub wings were incurring damage when they were removed at the squadrons, said AIRSpeed Chief Gunnery Sgt. Howard Ditson.

U.S. Navy photo by Jacquelyn Milham

Cpl. Clayton Mantz, an electric cable harness repair technician, holds up a helmet extension cable to explain to Boots on Ground attendees how his work center originated a repair procedure that eliminated a deficit for the cable resulting in a cost savings of more than $1 million over three years.

"We worked with them to standardize removal and installation and then walked through the process with them," Ditson said.

Sgt. Michael Winn, airframes collateral duty inspector, briefed BoG attendees on how MALS-39, under a memorandum of agreement with Naval Air Systems Command (NAVAIR), U.S. Marine Corps Light/Attack Helicopter Program Office (PMA-276) and Naval Supply Systems Command Weapon Systems Support, were able to reclaim 20 wings. "We [were able to give] back three maintenance man-hours per procedure," Winn said.

To date, MALS-39 has repaired nine stub wings at a cost of approximately $200 per wing, and they are expected to save approximately $3 million from their efforts.

Cadmium Electroplating Capabilities Reduce Costs

In 2012, the flight line experienced a critical shortage of upgraded main rotor gearboxes. The gearboxes, which can be equated to a helicopter's transmission, were being damaged by water intrusion, cracks and complex repair procedures.

To overcome this, Marine Capt. Gary Pickardt, MALS-39 AIRSpeed officer, said the community implemented several changes including switching to materials that slow down corrosion such as dry film and Thixogrease; implementing cadmium electroplating capability (cadmium serves as a barrier between two different metals to prevent corrosion); and manufacturing a stand to help with maintenance.

Cadmium plating technician Sgt. Carlos Rivera said that it used to take three days for artisans to perform the job at a cost of approximately $3,000. After receiving training from Fleet Readiness Center Southwest, which made cadmium electroplating a local capability, MALS-39 now has 11 qualified maintainers who can perform the task in four hours.

MALS-39 has performed 95 cadmium electroplating maintenance actions, saving $284,000 and expects to conduct another 92 cadmium plating jobs in 2015 with expected savings of $276,000.

In addition, the original equipment

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Vice Adm. Mike Shoemaker (green flight suit), commander, Naval Air Forces, listens to a brief about the H-1 main rotor gearboxes. Due to the continuous process improvement (CPI) efforts of MALS-39, the gearboxes are no longer the H-1's top readiness degrader.

"Decisions that will be in place for decades are being made. We can take the lessons learned here at MALS-39, apply them to other [type/model/series] like the CH-53K and get ahead of those degraders that impact readiness."

manufacturer separated the gear box into two repairable components at the suggestion of MALS-39, leading to additional savings of $900,000, Pickardt said.

To date, the squadron has repaired 10 main rotor gearboxes, saving more than $10 million.

"Because of CPI, the main rotor gearbox is no longer my top readiness degrader," said Col. Michael Moore, Marine Aircraft Group 39 Commanding Officer and H-1 type/model/series lead.

Corrosion , however, remains a top readiness degrader for deployed units.

In April 2014, returning H-1s deployed with the 13th Marine Expeditionary Unit (MEU) found mast poles with corrosion on three of its seven aircraft. Aircraft returning from deployment with the 11th MEU in March had the same damage.

Marines see this as an opportunity to implement continuous process improvement while forward deployed, Pickardt said.

Tail rotor blades are another readiness degrader for the H-1s. Repairs for the rotor blades in 2014 cost almost $30,000, and the original equipment manufacturer was unable to meet fleet demand. Organizational-level maintainers spent almost 75 percent of their process time waiting for ready-for-issue blades.

After developing procedures and receiving authorization to test the tail rotor blades, MALS-39 reduced turnaround time from an average of four days to one day and extended the service life of 289 blades.

In addition to benefiting H-1 squadrons, leadership is also excited about applying these improvements and process changes to future depots.

"The depots for the CH-53K are being stood up right now," said Rear Adm. Paul Sohl, commander, Fleet Readiness Centers and assistant commander for Logis-

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Love of Learning Nets Marine Recognition

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Staff Sgt. Mario Martinez received the Naval Aviation Enterprise (NAE) Site Visit Excellence Award during the Boots on Ground April 27 at Marine Corps Base Camp Pendleton, California, for his efforts to improve readiness at Marine Aviation Logistics Squadron (MALS) 39.

The award recognizes an individual who has improved command readiness through continuous process improvement (CPI) methodologies and principles. Lt. Gen. Jon Davis, deputy commandant, Marine Aviation, presented the honor to Martinez.

Martinez, who is a communications navigation and cryptograph technician and CPI operations manager, has participated in seven CPI events at the command since 2012.

Martinez said he learns something new every day as a CPI practitioner, and found this to be especially true for the H-1 main rotor gearbox cadmium electroplating project for which he was recognized.

"I had no idea what the plating even was. I knew nothing about the process," he said.

But not knowing proved to work in his favor. The more he asked questions, the more work center personnel learned about their work. "I kept asking questions and got them to break down the process to its simplest parts," Martinez said. "We looked at the process four to five different times to get it just right."

That perseverance paid off. The team developed a new plating system for the H-1's main rotor gearbox that reduced the process time by 90 percent, increased readiness and is projected to realize a cost savings of more than $140,000 in fiscal year 2015.

CPI began to play a role in Martinez' career shortly after his enlistment in 2005. "I first heard about CPI while serving in Iraq in 2006. We applied "5S" by cleaning up our spaces and designating assigned spots by taping off areas," he said.

tics and Industrial Operations, NAVAIR, in reference to the Marine Corps' new heavy lift helicopter. "Decisions that will be in place for decades are being made. We can take the lessons learned here at MALS-39, apply them to other [type/model/series] like the CH-53K and get ahead of those degraders that impact readiness."

Jacquelyn Milham is a communication specialist supporting the Naval Aviation Enterprise public affairs office.

U.S. Navy photo by Jacquelyn Milham

Vice Adm. Mike Shoemaker, left, commander, Naval Air Forces, studies a yoke assembly bushing with Lt. Gen. Jon Davis, deputy commandant for Marine Aviation, during a Boots on Ground event April 28.

"5S," a philosophy that focuses on workplace organization and eliminating waste, stands for shine, sort, standardize, straighten and sustain with safety often added as the sixth "S."

"I only began to understand the theory behind it after I took white and yellow belt training," Martinez said, "but it really came together during a 2007 green belt course at Marine Corps Air Station Yuma. The green belt course broke it down into basics and showed me its simplicity. It doesn't just apply to any one industry, and can be used for any process. Now I have a specific, scientific approach to making changes."

The training Martinez refers to provides Sailors and Marines a general understanding of CPI concepts (white and yellow belts) while the green belt develops CPI practitioners who can then facilitate improvement projects in their commands. Practitioners who earn their black belts or master black belts are considered experts and provide project support and guidance.

Three years later, Martinez transferred to MALS-39 and was asked by his command in 2012 to become part of its site core team. "I was being offered a chance at getting more education. I love learning and I am always looking for opportunities," he said.

His passion for education is underscored by what he considers his proudest accomplishment at MALS-39—his influence on Marines in his command. "I taught all of the yellow belt courses and I've met a lot of Marines from different backgrounds face-to-face," he said. "When they finally understand CPI, I get to see their bright-eyed look. They know that they can change how they work and have an impact on Marine life. I teach them that it is possible to strive for perfection."

Martinez gets Marines thinking about teamwork as well. "A lot of the success of a project relies on the team itself and can be a matter of getting experts together and functioning as a group," he said. "That is just as important as the process."

Martinez said practitioners should keep it simple when it comes to CPI. "Some Marines who are just starting to use the toolsets can become overwhelmed and confused as to where to start."

"I tell them to focus on the small things. Compounded, they will make a huge difference. They will begin to see that the 'ball'—the scope and impact of the project—will get bigger and bigger as they grow and better understand the toolsets," he said.

Martinez plans to leave the Marine Corps within the next year to pursue a degree in engineering with hopes of becoming a business owner. "CPI revealed my left-brained, statistic side," he said.

"CPI works," he said. "You can apply it to anything if you open your mind, change your way of thinking and take advantage of opportunities."

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