

Antenna Gaskets and Floorboard Tapes Lower Price of Aircraft Maintenance

New Material Increases Availability of Aircraft Fleet

By Cynthia Greenwood

(This article is the first of a two-part series focusing on the far-reaching applications of a joint Service initiative sponsored by the DoD Corrosion Policy and Oversight Office.)

While Dave Schmidt served as the U.S. Coast Guard's corrosion program manager in 2000, he was asked to resolve a persistent corrosion problem on the antennas and floorboards of the agency's fleet of HH-65 Dolphins (a.k.a. Dauphins), twin-engine helicopters that conduct search-and-rescue missions in U.S. coastal waters.

During this period, USCG aviation technicians removed the antennas every six months to clean and treat them for corrosion. After spending 60 labor hours per Dolphin for each inspection twice a year, maintenance on the helicopter fleet became costly, Schmidt said. "We estimated we were replacing 30 to 40 percent of the antennas for corrosion each year."

In 2001 Schmidt learned about a unique material that prevents antenna and floorboard interface corrosion. The material—known as Av-DEC sealant—takes its name from Av-DEC, the aviation and electronic parts manufacturer. The USCG Corrosion Office started testing the conductive antenna gaskets on selected Coast Guard helicopters to see how it reduced corrosion and labor hours. “We tested the nonconductive floorboard tape as well,” he said. “The floorboard problem was a huge cost driver for the Coast Guard. The success of the floorboard tape helped convince the HH-65 program manager to adopt it for the whole fleet.”



U.S. Navy technicians apply an Av-DEC sealant system to the antenna interface of an H-60 Seahawk helicopter. Photo courtesy of Av-DEC.

Since the Coast Guard has approved the new technology, the agency inspects its helicopter gaskets every year and hopes to expand that schedule to every four years. “Right now, they’re saving an estimated 60 labor hours every six months, plus a day of downtime and hazardous material disposal costs,” Schmidt said. “The Coast Guard has not replaced a single antenna from corrosion since we used the gaskets, to my knowledge.”

As Schmidt began briefing corrosion experts in the Navy, Air Force, and Army about the Coast Guard’s success with the gaskets, word spread about its potential benefits for all military aircraft. This awareness coincided with the prospect of new corrosion-prevention funding for all service agencies in 2004 from the Office of the Secretary of Defense (OSD) Corrosion Policy and Oversight Office.

“Each service was coming to the table with an Av-DEC project,” Schmidt said. Rather than apply for individual funding for the same technology, NAVAIR representatives convinced members of the Joint Council on Aging Aircraft to unite in applying for joint money to purchase and install the new gaskets, he recalled.

In the meantime Schmidt left his active duty post as a chief warrant officer and joined Av-DEC as a military program manager. At that time, Schmidt offered to let any service agency test the gaskets on their equipment free of charge. “From 2001 to 2002 we basically gave the material away and begged people to fly it,” he recalled.

Using a \$2 million award from the Corrosion Policy and Oversight Office, the Navy, Air Force, Army, and Coast Guard have begun using the Av-DEC gaskets to prevent antenna and floorboard interface corrosion. “This technology benefits the entire aviation community,” says Craig Matzdorf, Senior Corrosion Engineer at Naval Air Systems Command (NAVAIR).

Both NAVAIR and the Air Force tested the gasket technology in various applications on different aircraft during early field demonstrations. Based on the success of these trials, the Navy has begun applying the conductive gasket between the antennas and aircraft body on its entire fleet of 108 EA-6B Prowlers, fixed-wing fighter aircraft that support air strikes and ground troops by interrupting enemy electronic activity.



U.S. Navy technicians apply an Av-DEC sealant system to the antenna interface of an H-60 Seahawk helicopter. Photo courtesy of Av-DEC.

Likewise, 310 of the Navy's H-60 Seahawk helicopters, including 48 new ones, will benefit from the new material. The Seahawk enhances the capability of Navy warships, used for anti-submarine warfare, search and rescue, drug interdiction, and cargo operations. "We were losing the antennas due to corrosion, and the quality of the communications was being degraded," Matzdorf said. "The new gasket eliminates both problems."

"The corrosion gets so bad on the Seahawk antennas, it degrades the electrical bond, and the radio's performance decreases," Schmidt said. "The Navy technicians want to keep the radio efficiency at its peak." By using the gaskets on the H-60 Seahawk, the Navy will

reduce costly inspections for antenna corrosion. "This will save about 20,000 maintenance man-hours per year, increase readiness, and decrease maintenance costs," Matzdorf added.

Easily compressible and resembling a muffler or engine gasket, the new gasket consists of a blue, squishy polyurethane gel, and it comes pre-cut in a kit to fit each antenna, Matzdorf explained. The conductive version allows the electricity to flow between the antenna and aircraft surface. The nonconductive gaskets protect the floorboard interface, he added, and come in rolls with adhesive on one side, allowing the applicator to roll it out and apply as necessary.

Historically, the corrosion of antennas has proved costly for the Navy and other Services. During fiscal year 2004 alone, the Navy spent \$318,000 to replace numerous antennas on its EA-6B Prowler.

The Services funded their own field testing from 2002-2004, which helped NAVAIR and the Air Force validate the gaskets' performance, Matzdorf said. "From that point, we began changing our technical manuals in order to implement this technology throughout the services. Within a five-year period we went from new product testing to implementation on equipment used by NAVAIR, the Air Force, the Coast Guard, and AMCOM (Army Aviation and Missile Command)," Matzdorf said.

Aided by the OSD grants, the Army and Coast Guard will outfit their H-60 helicopters with the new conductive gaskets and floorboard tape. Using the grant, the Air Force will also apply both types of



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gaskets to its fleet of C-130 Hercules, a versatile turboprop plane that can air-drop heavy loads or deliver cargo and personnel to rough outposts.

“We were inspecting H-60 antennas every 28 or 56 days. Now, with the gaskets, we don’t have to touch them for at least a year. And that’s fabulous,” Matzdorf said.

(In the next issue of *CorrDefense*, the writer will explore how the application of the gasket and floorboard tape technologies, supported by the OSD grant, have benefited all DoD Services.)

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