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Fleet Readiness Centers Address Hornet Challenges

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An F/A-18C Hornet assigned to the VFA-113 Stingers flies over southern Afghanistan
in 2009 during Operation Enduring Freedom.
(Photo by Cmdr. Erik Etz)

From his NAS Patuxent River, Md., office, Rear Adm. Paul Sohl, Commander, Fleet Readiness Centers (COMFRC), shared the Naval Aviation Enterprise's (NAE) collaborative effort to address the aging Hornet fleet maintenance and repairs.

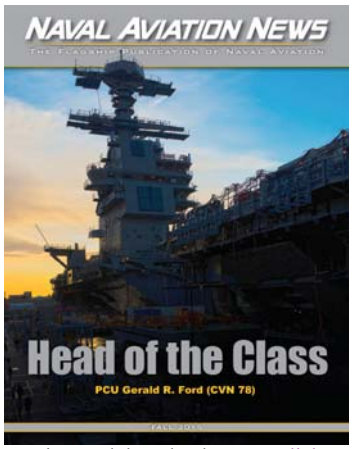
If you ask COMFRC about the aging legacy Hornet fleet, he will tell you about his production line, his talented artisans and the collaboration across the NAE to increase the number of F/A-18A-Ds returning to the flight line. He will also explain how the number of "out of reporting (OOR)" legacy Hornets accumulated over several years.

"The design life for a legacy Hornet was originally 6,000 flight hours," said Sohl. "Those aircraft are being extended past 8,000 flight hours, with some being extended to 10,000 flight hours. The engineering, material and production efforts required to achieve such life extensions on a tactical aircraft are unprecedented."

As of 1 December, there were 616 legacy Hornets in the Navy/Marine Corps fleet with 541, or 88 percent, operating above 6,000 flight hours, according to the F/A-18 and EA-18G Program Office's (PMA-265) monthly flight hour and inventory report. The following lists the number of aircraft above the 6,000-flight-hour service life:

- 158 are between 6,000 and 7,000 hours
- 293 are between 7,000 and 8,000 hours
- 89 are between 8,000 and 9,000 hours
- One aircraft is operating above 9,000 hours and is on its way to the service life extension goal of 10,000 flight hours.

- **On the cover of the Fall 2015 issue**



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According to PMA-265, 114 aircraft have completed inspections and are designated for service life extensions beyond 8,000 flight hours, with an additional 102 aircraft undergoing high-flight-hour inspections at Fleet Readiness Center (FRC) Southeast, aboard NAS Jacksonville, Fla., and FRC Southwest, aboard NAS North Island, Calif., facilities in addition to other field sites as of 26 November.

Lonnie Conditt, left, and Narom Orr, right, both machinists at Fleet Readiness Center Southeast in Jacksonville, Fla., measure holes to ensure alignment of an F/A-18 Hornet part on the production line.
(Photo by Victor Pitts)

"One of the big challenges we face is, the more the fleet flies them, the faster they're coming to the FRCs," said Sohl. "In addition, the sequestration-related hiring freeze and furloughs during fiscal year 2013 slowed down the FRCs' 12 million man-hour-a-year production machine. It is taking time to reverse that trend."

"The six furlough days and overtime restrictions equated to six weeks of reduced work hours. In addition, attrition and the inability to hire replacements slowed us down even more," he said. "We made progress hiring engineers, logisticians and artisans during fiscal year 2014 and are continuing that trend in 2015. The FRC workforce is returning to pre-sequester numbers."

Sohl added that the fleet will see an increase in Hornet deliveries during fiscal years 2015 and 2016 as the FRC F/A-18 production lines continue to ramp up. Engineering analysis and instructions, parts and materials and trained artisans also had to be put in place.

"Meanwhile, the inductions do not stop," said Sohl. "Aircraft keep coming into the FRCs, particularly at the 8,000-hour mark when additional depot-level maintenance is required. What excites me is that it is now time for the FRCs to step up and produce. It is a challenge I absolutely know the FRCs are ready to undertake."

Recovery Plan

The NAE is working toward a comprehensive recovery plan, which includes a service life extension program (SLEP), a collaborative inspection process, and a list of fleet priorities from Commander, Naval Air Forces (CNAF) based on the DoN's deployment requirements.

One aspect of the recovery plan is led by PMA-265, which created a team of stakeholders to track integration efforts. This undertaking is managed by Marine Corps Lt. Col. David Smay, the PMA-265 F/A-18 OOR integrated product team lead.

The OOR Drumbeat is an integration effort between the FRCs; Naval Air Systems Command (NAVAIR); Naval Supply Systems Command; Headquarters, Marine Corps; Deputy Assistant Secretary of the Navy for Air Programs; the original equipment manufacturers (Boeing and Northrop Grumman); the Defense Logistics Agency; and CNAF.

Sohl compares the process of extending the service life of a legacy Hornet to keeping a high-mileage car on the road. There are standard work procedures at the FRCs similar to changing the oil in a car, which is a standard service for mechanics with a set price. And then there are high-flight-hour aircraft arriving at an FRC for major structural repairs.

"It is similar to a car needing major bodywork," said Sohl. "At the body shop, the car is examined by an insurance adjuster, an estimator determines which parts to order and a body mechanic performs the work."

"The similarity stops there because parts are available for your car, but that is not the case for some of our legacy Hornets," he said. "Historically, the system was not able to absorb that new requirement."

Kai Boyce, an aircraft artisan at FRC Southeast in Jacksonville, Fla., makes a repair in the auxiliary power unit compartment of an F/A-18 Hornet in June. (Photo by Victor Pitts)

Aircraft Inspections

"FRC artisans extensively inspect each aircraft, often disassembling it down to the fuselage bulkheads and formers while scrutinizing parts based on the 'hot spots' described in associated inspection bulletins," said Smay. "The panels are removed, the engines are removed, the cockpit is dismantled; each step is taken to ensure the aircraft will be safe to fly upon return to the fleet."

In addition to the routine findings that require repair or replacement of an affected part, aircraft are often found to have corrosion or damage in adjacent areas not immediately covered by the inspection protocol. These unexpected findings are becoming increasingly prevalent as the aircraft continue to age and require the procurement or manufacture of a part that has rarely — if ever — been previously procured.

"The drumbeat facilitates an open line of communication between the subject matter experts doing the work," said Smay. "The artisans, engineers and supply specialists, each working for various entities, all come together to address each complex case as a unit."

Engineering

When the artisans find unexpected damage or corrosion, they look to NAVAIR engineering for a solution.

"NAVAIR's Air Vehicle Engineering Department has developed several 'engineering levers' to streamline the requisite engineering analysis in the form of request for engineering instructions (REIs) at the FRCs," said Tom Rudowsky, the department head for NAVAIR's Air Vehicle Engineering Department.

Rudowsky compared the engineering role at the FRCs to a carrier backstop to ensure aircraft return to service. "When standard work and repair manuals are exhausted and there is unusual or unexpected damage, we get the 911 call in the form of REIs," he said.

One initiative improving the speed it takes to triage an aircraft is the building of a closer relationship between production artisans and engineers, resulting in higher quality and first-pass yields of REIs.

"About 15 percent more engineering capacity was made available by shifting the fleet's in-service repair work from NAVAIR engineers to Boeing engineers in August," said Rudowsky. In-service repairs have the highest priority because they are needed to return flight line assets to service.

COMFRC's implementation of the Theory of Constraints Critical Chain Project Management across the F/A-18 FRC enterprise is also playing a major role by helping prioritize REIs. Another FRC priority is to continually develop its engineering workforce talent.

"We are continuing to grow our engineering talent with a structured skills-development program and active recruitment," said Rudowsky. "We have the most capable engineering workforce the Navy has

ever known. We can save just about any jet given time and money, but that's not our task. Our task is to return mission capable aircraft back to our warfighters as quickly as possible."

"From the engineers to the artisans, we rely on skilled people," Sohl said.

While visiting FRC East at MCAS Cherry Point, N.C., Sohl was impressed with an artisan who applied best practices from his time working on F-4 Phantom structural repairs. By adapting aspects of the Phantom structural wing modification process to the F-35 Lightning II, processing time was reduced from seven days to two days.

"That to me epitomizes the talent we have in the FRCs," Sohl said. "Those kinds of people are worth their weight in gold."

Additive Manufacturing

The FRCs also employ additive manufacturing — cutting-edge technology using 3-D modeling to create prototypes that are "printed" from digital files — to improve quality and accelerate production of aircraft and components. NAVAIR has applied additive manufacturing technology in its prototyping facilities since the early 1990s and the capabilities continue to expand across NAVAIR's warfare centers and the FRCs.

"All of our FRCs use polymer-based additive manufacturing systems to rapidly produce form blocks and tooling for sheet metal parts, validate 3-D models and fit check parts, produce work aids, and directly manufacture plastic ducting for aircraft systems," said Sohl. "In the future, the FRCs will be producing additive-manufactured metal parts for our aircraft."

Sailors cheer as an F/A-18C Hornet attached to the VFA-192 Golden Dragons launches from USS John C. Stennis *(CVN 74) in 2013.*
(Photo by MCSN Marco Villasana)

Looking Ahead

The Navy is now evaluating the opportunities to extend the service life design limits of the F/A-18E/F Super Hornet, according to the program office. Upon determination that the F/A-18E/F service life can be extended beyond the original 6,000-flight-hour design limit, a SLEP will be implemented to increase the service life to 9,000 flight hours.

By Andrea Watters

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