Finding Keys to FOD Prev

By Lt. John Turner

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One of naval aviation's greatest readiness degraders is foreign-object damage or FOD. Any maintainer who has experienced its impact is keenly aware that this hazard must be prevented. Doing that requires focusing on prevention and awareness techniques. Sometimes, this effort is easier said than done, but a few tips might help. Let me share a few lessons learned on VF-31's "Tomcat Farewell Tour."

We left Norfolk Naval Station for a scheduled Arabian Gulf deployment. During the first day at sea, our aircraft launched from Naval Air Station, Oceana, en route to USS *Theodore Roosevelt* (CVN-71) for CQs. Maintenance personnel quickly were earning their sea legs. Underway just 12 hours after cycling through aircraft and aircrew, "it" happened: We experienced our first engine FOD.

Although the cause of the FOD remains undetermined, an analysis of the damaged engine led us to suspect a hard object (screw, nut, bolt, washer, etc.) had been ingested. We did a post-flight inspection, but no new aircraft fastener discrepancies were noted, eliminating maintenance procedures as a causal factor. The operating environment was considered; however, pinpointing the origin of the FOD was difficult. The aircraft had been started at NAS Oceana, hot-switched on board the ship, and shut down on the flight deck after the evening CQ. The FOD could have been ingested anywhere.

Our Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) veterans were ready and willing to answer our nation's call, but this incident indicated a program failure. Losing aircraft availability

vention and Awareness

to a FOD on the opening day of the Tomcat's final deployment was not an enviable position. It made us rethink our position and look at how FOD affects the Navy.

Cost-Wise Readiness

Time and money are precious resources in carrier aviation. Long gone are the days of "readiness at any cost." The new marching orders are "Readiness at the right cost. The venerable F-14s have aged considerably. Our maintenance man-hours per flight-hour have hovered in the mid-40s over the past three years. Our oldest F-14D, an F-14A retrofit, was sold to the Navy in 1975. It requires special care to remain an effective combat asset.

The 36 man-hours wasted on the FODed engine could have been spent on flight-deck operations, preventive upkeep, or other maintenance to increase availability and usage rates. The FOD cost us more than organizational man-hours. The replacement cost of a new F110-GE-400 engine exceeds 3.2 million dollars. The estimated cost to rebuild a FODed motor is $330,700 at a Depot. FOD-induced costs degrade readiness, are preventable, and must be eliminated.

We can't put bombs on target when an engine is FODed.

How to Prevent FOD and Increase Awareness

Our lessons learned encompass both old and new. We need to ask ourselves two questions: "What can we learn from this FOD?" and "What can we do to prevent a similar occurrence?" Four key steps come to mind.

1. Assess the operating environment. During planning meetings, our leadership assesses the environment unique to the mission and notes potential FOD hazards. FOD walkdowns twice per day and prior to all engine run-ups (regardless of environmental considerations) are the mainstay. Leadership engaged in eliminating FOD should "manage by walking around" to identify hazards. This step is the first one in mitigating the risks.

2. Communicate FOD awareness and the potential risks associated with FOD hazards. Discuss FOD and its potential for degrading readiness and asset availability at every maintenance meeting. In order to succeed throughout an arduous inter-deployment readiness cycle (IDRC), we communicated FOD prevention at every opportunity. Our maintenance leadership consistently asks itself, "What can the organization afford in terms of FOD and it's associated detrimental effects to readiness?"

3. Institute a FOD prevention program focused on eliminating the leading causal factor. Our fastener integrity program standard operating procedure (FIPSOP) assigns each work center an area of responsibility to inspect for loose, missing or faulty fasteners. In addition to plane captain daily inspections, CDIs inspect assigned aircraft-panel fasteners before the first launch of the day, followed by a QAR, then the flight-deck coordinator, and finally the aircrew.

4. Make sure all hands consciously participate

during FOD walkdowns. Everyone must understand that the walkdown process is merely a means to collect information to determine how to proceed with a prevention program, and it is only as valuable as the information gleaned from examining the FOD collected. A critical eye examining the material collected during FOD walkdowns should determine its origin. Then push those findings down to the deck plates to emphasize proper housekeeping. Young maintainers must understand where FOD originates in order to successfully prevent it from migrating to the flight deck and flight line. They must understand the monetary and manpower costs relative to the organization and make sure the prevention process mitigates the risks.

Producing Positive Outcomes

The answer to the question, "What costs will the command afford in terms of losses in readiness attributed to FODs?" is "none." We established an aggressive fastener-integrity program, improved housekeeping, and have not experienced a single FOD from loose, faulty or missing fasteners. Aircrew, QA, maintenance control, and work-center leadership communicate the risks and are fully engaged in the prevention process. This increased awareness and proactive approach has mitigated the hazards and reduced engine replacement and maintenance man-hour costs.

These steps, along with all-hands participation, are critical for effective prevention. We have reduced our FOD occurrences 50 percent over the previous year and aligned our efforts to eliminate the risk of FODs completely in the year to come. It proves a squadron can follow the book, improve safety procedures, and still continue to operate at the tip of the spear.

Lt. Turner was the MMCO when this story was written. CWO4 Ron Stebbins assisted Lt. Turner and recently reported to the Naval Safety Center.

WESS BRT NEWS

Information on WESS is available on the Naval Safety Center website (www.safetycenter.navy.mil/wess). Visit and see stories, FAQs and videos on efforts to improve this valuable and required program.

Day the L

By AM2 Michael Holthaus

My whole world turned black one sunny day around 1330. I was on my hands and knees, feeling around to figure out how to get out from under a turning jet and wondering if I could see. I never have been so scared.

I had been called to one of our jets because hydraulic fluid was all over the port keel. The team got set up for a low-power turn. After a little investigation, I found the leak, which, to tell the truth, was in an awkward place. We shut down the jet and did the necessary fixes.

I set up for another turn, and, to my dismay, the leak came back. In a moment of divine wisdom, I grabbed a wrench and decided to see if I could stop the flow. I probably don't have to remind anyone, but a charged line is pressurized to 3,000 psi. At the time, I was wearing dark lenses and barely could see, so I kicked back my goggles—like so many maintainers do at one time or another. What a big mistake!

With my face just 10 inches away from the spot where I was working, I pushed up on the wrench, and the line sheared, causing a large shot of hydraulic mist to blow back in my face, engulfing my head. My eyes shut instantly. I started to fall backward and then to the side. I jumped back up and motioned for the plane captain to shut down the aircraft. The plane captain was stunned, so I tried again to signal for shut down. At this