

On the Cuff of Failure

By AE1 Cassandra Daniel

My squadron, like most in the Navy, is a complex unit tasked with high-tempo ops that include daily operational commitments and regularly scheduled aircraft maintenance. When the heat of action builds, everyone must be on the same page, and communications are critical. We recently had an incident that showed just how important.

An ISIS (isochronal scheduled inspection system) is an ideal example of regularly scheduled maintenance where tasking requires countless maintenance processes to occur so aircraft can be maintained and operated safely. To ensure an orderly completion of the ISIS, the steps are controlled through a sequence-control chart (SCC), which allows several tasks to be worked on concurrently.

The completion of technical directives (TDs) is one of many requirements also done during an ISIS. Our first one on a deployment in Misawa, Japan, involved the completion of AYB-1055. This directive requires we check the afterbody bolts for proper thread count and nut plates for security. If any failure is found, each failed bolt and nutplate must be replaced.

Power plants had to incorporate this particular TD. While complying with it, the squadron discovered several nut plates were bad. The technician left the bolts in place to point out which nut plates were bad.

As previously mentioned, several procedures are being done at the same time to complete the inspection. Some of those procedures require the propeller



Damaged blades are a big concern with any aircraft.

and blades to be rotated, including static pitchlock checks.

Two electricians were assigned to complete the static pitchlock checks on the No. 1 and No. 2 propellers. An AE2 was assigned to the flight station to begin moving the propeller blades, and another AE2 was acting as the outside observer. They completed the static checks on the No. 2 propeller without noticing anything unusual and then continued onto the No. 1 propeller. The AE2 acting as outside observer immediately signaled the AE2 in the flight station to stop because he noticed damage to the No. 1 blade cuff. At this point, they stopped all maintenance and immediately reported the problem to maintenance control.

Extensive damage occurred to the blade cuff on the No. 1 propeller and lesser damage to the No. 2 propeller. The damage took place when the propeller



This close-up shows how bad it can get.



Several people could be at fault, but no one knows who's guilty.

blades were rotated and came into contact with afterbody bolts left in the wagon-wheel structure of both engines after completing AYB-1055.

Power-plants personnel were assigned and completed servicing on all of the propellers. The electricians cleaned the slip-ring assemblies and installed the brush blocks. These actions required the blades/propellers to be rotated.

Where was the breakdown? When exactly did the damage occur? Each maintainer involved with jobs done during the ISIS was adamant that no damage had

occurred during their particular maintenance action.

The result of this coordination failure was the loss of a propeller with a repair cost of \$121,644 and damage to a second one. The command also had to expend extensive man-hours to repair and replace them. Although each individual denies responsibility for the damage to the propellers, it is clear that poor maintenance procedures and insufficient supervision were at fault.

The maintenance instruction manual does not state that the afterbody bolts should be removed immediately, but this critical step clearly should have been taken after completing the inspection. The bolts then should have been marked and stored for accountability. As maintenance professionals, we must have total situational awareness, especially at the supervisory level, about concurrent tasks that involve multiple work centers. Maintainers assigned to complete any maintenance action must do an operational risk management (ORM) assessment before beginning any job.

It was determined that the propeller damage could have occurred over several days and possibly on separate occasions. Without personal accountability and integrity, it is impossible to know exactly when or how it occurred.

All maintenance personnel received training on the proper steps to incorporate AYB-1055 and

the importance of not leaving afterbody bolts in the wagon wheels after removing the afterbody. Our entire department also reexamined the most important character trait when it comes to maintenance safety and the operation of aircraft: integrity.

QA also submitted a technical-publications deficiency report (TPDR) on NA-01-75PAA-2-4.6. They requested a caution be included to highlight the damage that can occur if the afterbody bolts are left in without the afterbodies being installed. ✈️

Petty Officer Daniel is the ground-safety petty officer at VP-40.