



Interagency Aviation Accident Prevention Bulletin



No. IA APB 23-05

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Subject: Maintenance Related Incidents and Countermeasures for Human Errors

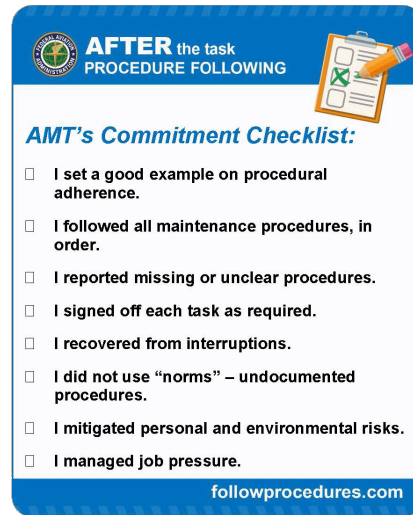
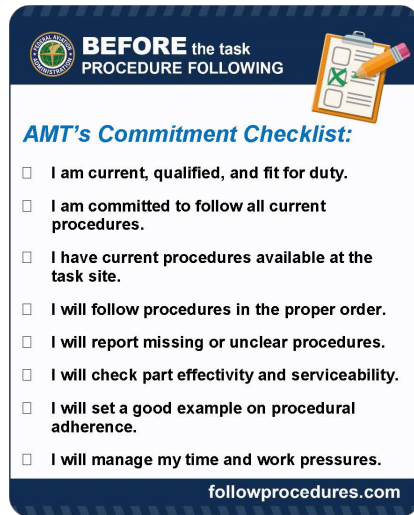
Area of Concern: Flight Safety

Distribution: All Aviation Operations

Discussion: Four SAFECOM reports submitted recently highlight the importance of performing proper aircraft maintenance and the value of thorough preflight inspections. Although these instances are unrelated, they do provide an opportunity to highlight the effects of human errors in aviation maintenance. One notable bulletin from April, [IA APB 23-02](#), spotlighted the importance of ensuring the aircraft is ready for flight, a responsibility of aircrew and ground crew. [IA APB 09-06](#), released in 2009, initiated important dialogue about human factors in maintenance. These documents, in conjunction with the four recently submitted SAFECOM reports, offer a detailed look into maintenance-related incidents. A summary of these incidents are as follows:

- SAFECOM [23-0625](#): A night shift maintenance crew that was working long hours, installed the aft upper pitch change link limiters backwards. After multiple missions, a different night shift mechanic discovered the error and replaced the part (a vinyl washer). The vinyl washer prevents the pitch change links and the pitch horn from making metal on metal contact.
- SAFECOM [23-0630](#): While performing an engine swap after multiple chip lights, the mechanic noticed that the drain hose was not installed correctly. The mechanic lifted the bottom of the panel to install the drain hose. The action of lifting the panel dislodged the firewall which went unnoticed by the mechanic at the time. The helicopter performed a series of ground runs and a test flight and went back into service that evening. The next morning during the pre-flight inspection, the mechanic noticed that the firewall was in contact with the driveshaft and had scored a line in the driveshaft as it rotated during the ground runs and test flight. It removed approximately 10% of the material in the driveshaft.
- SAFECOM [23-0637](#): The mechanic observed oil residue in the #1 engine area while preparing the helicopter for a flight. The pilot started the engine so that the mechanic could conduct a leak check. While the mechanic wiped residual oil with a rag, the rag was ingested into the #1 engine oil cooler blower, damaging the cooling fins.
- SAFECOM [23-0642](#): The pilot conducted a preflight inspection of the airplane and was unaware that the elevator trim had been replaced. He operated the trim and flight controls and confirmed freedom of movement. During the takeoff run, the airplane rotated at a speed lower than normal. The pilot corrected with manual pressure and trim and realized the control service pressures were abnormal. The pilot discontinued the maintenance test flight. A post-flight inspection revealed that the elevator trim was installed incorrectly, and the trim tab moved opposite of the desired direction.

Safety culture improvements and human error reduction requires continuous effort and a shared commitment to following procedures. The FAA's Aerospace Human Factors Research Division created the Before-and-After Procedure Following Task Cards, seen below, to help in that effort. These cards remind personnel of important steps to complete before, during, and after performing tasks.



Additionally, each of the recent solicitations for Airtankers, Helicopters and Light-Fixed Wing aircraft have a requirement for initial and recurrent mechanic Human Factors training. In the table below and can be found here: [Activities, Courses, Seminars & Webinars - ALC Content - FAA - FAASTeam - FAASafety.gov](https://www.faa.gov/aircraft/air_certification/aircraft_certification/aircraft_certification_content/activities_courses_seminars_webinars_alc_content_faa_faasteam_faasafety.gov).

Course Number	Course Title	Type of Training	Training Hours
ALC-258	Human Factors Primer for Aviation Mechanics	Initial	1.5 Hour
ALC-534	Follow Procedures the Buck Stops Here	Initial	1 Hour
ALC-37	Failure to Follow Procedures INSPECTIONS	Recurring	1 Hour
ALC-67	Failure to Follow Procedures - Installation	Recurring	1 Hour
ALC-180	Aircraft Maintenance Documentation for AMT's	Recurring	1 Hours
ALC-327	Maintenance Error Avoidance	Recurring	2 Hours
ALC-911	Fatigue Countermeasure Training	Recurring	2 Hours

According to the FAA, about 80% of maintenance errors involve human factors that if not detected would lead to negative outcomes including accidents. Human errors can happen to anyone; experienced or inexperienced, flight operations or maintenance operations, high or low operations tempo alike. Increase your awareness, train, and use available tools to safeguard from these pitfalls.

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