

Reducing Hornet FCF Requirements

By Lt. Steve Barr

For the past two decades, approximately four percent of all flights flown in the Hornet community have been functional check flights (FCFs). By reducing the number of required FCFs, the community can regain valuable sorties to improve tactical performance. In October 1999, the Hornet Executive Steering Committee approved the use of an FCF-tracking program developed by the VFA-15 quality-assurance division.

The commanding officer—working closely with the maintenance officer, quality assurance officer, and QA chief—approved a simple, Windows-based, data-collection software program. Software, instructions and project goals were sent to all Navy and Marine Corps Hornet commands in March 2000. The purpose of the program was to track and document the number of FCFs flown, specific maintenance discrepancies, and results of each actual or attempted FCF flight.

The FA-18's reliability, system redundancies, and thorough ground-test capabilities make the aircraft safe to operate. The goal of this project was to determine whether maintenance ground testing of gripes—currently requiring an FCF—is sufficient to evaluate the system's functional status without the check flight. To answer this question, each FA-18 maintenance department was asked to collect FCF flight data over a period of six months, using the program provided by VFA-15. By

November 2000, a database containing 626 FCFs had been collected and analyzed. We had received more than 1,200 entries, but almost 50 percent were unusable because the data was incomplete or in an unusable format.

The data was used to evaluate varying reasons for ground aborts or check-flight failures and to determine whether these failures were related to the preceding maintenance action. The desired result was a database to support modifying or reducing current FCF requirements.

The data was analyzed on a case-by-case basis to determine any relationship between maintenance done and an FCF. Simple metrics were developed to consider an event as successful or unsuccessful. A complete FCF, or any related discrepancy discovered during ground checks, was considered a success. For an FCF to be considered unsuccessful, it must have failed during flight for reasons related to the maintenance done.

We assumed an aircraft returning from an FCF with a downing discrepancy unrelated to the maintenance could have happened on any flight. In this case, the flight was not rated as successful or unsuccessful. An overall rating was determined by comparing the number of unsuccessful FCFs with the total number reported. If data revealed a success rating of 95 percent or greater, a recommendation was made to consider removing the requirement from the

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FA-18 NATOPs and NAMP. This recommendation also was balanced against known deficiencies in particular components and systems.

VFA-15 had a talented group of aviators and maintainers but lacked capable statisticians. Therefore, the data analysis was grounded solidly in basic-man theory and not in the science of stats.

For example, consider the removal and replacement (R&R) of a generic component (part X), which requires an FCF. For 100 R&Rs of part X (requiring 100 FCFs), 85 returned FMC. Using the metrics stated above, 85 FCFs were successful. Of the 15 flights that did not launch, 12 were downed on deck after systems checks revealed a failure associated with the maintenance. This scenario implies that the ground-test capability had a 97 percent success rate for part X. To be thorough, a comparison of the historic failure rate of part X to the derived FCF success rate may provide more support for further changes.

Based on the results gained from this project, VFA-15 recommended NavAir remove six maintenance actions that currently require an

FCF; two were accepted. It might sound like a small return for the effort expended. However, this program can provide the fleet with a tool to evaluate the effectiveness of other FCF programs with the ultimate goal of making maintenance more efficient.

An important factor in this study was the insufficient sample size for individual maintenance jobs. Without a statistically significant number of events, accurate conclusions were difficult to support, which led to several rejected recommendations. This effort still highlighted the distinct possibility of changing the status quo given the time and effort. To seriously evaluate current FCF directives, the entire Hornet community must participate. We must document and accurately identify meaningful trends and then take the necessary steps to change the system. The reward for these efforts will be increased tactical-training sorties and decreased flight-hour overhead. 

Lt. Barr wrote this article when assigned as the quality assurance officer at VFA-15. He recently transferred to VFA-125.

For more information about the Valion's FCF project, contact Lt. Barr at Barr.Steven@lemoore.navy.mil.—Ed.