

# Critical Chain Project Management Boosts F-18 Throughput by 81% at U.S. Navy's FRCSE Repair Depot

Flow Based Planning and Execution Cut Cycle Time, Improve Throughput

## Background and Business Need

More than 50% of the U.S. Navy's aging F/A-18 fighter jets are currently out for maintenance. The reason: Global demand for aircraft carriers has resulted in significantly higher-than-anticipated flight hours on the planes. Overhauling the F/A-18s has become especially critical because the fighters' replacements, the F-35s, are currently delayed. The large backlog of aircraft awaiting extensive work makes repair-depot throughput extremely important. However, the significant engineering requirements that have resulted from extending the design lives of the F/A-18s by more than 60% have made reducing cycle times very difficult.

## Multitasking Problems in Aircraft Maintenance

An efficient process for aircraft maintenance includes the following steps:

- The aircraft is brought into the depot and disassembled.
- A team inspects the parts and identifies needed repairs.
- Certain parts are repaired in-house, and others are fixed by or purchased from vendors.
- Finally, the aircraft is reassembled and tested.

In practice, the depots were experiencing the following scenario:

- Teams created detailed schedules for each aircraft and each phase of the work flow before the planes came in.
- High variability from one aircraft to the next – normal in maintenance and repair – was made even worse by the significant engineering requirements arising from an aging fleet.
- As work progressed, unexpected engineering requirements would emerge, ranging from a few hours to weeks of work.
- In order to get more answers back to the mechanics sooner, engineers would work on the easiest analyses first, leaving more difficult and time-consuming work for later.
- Mechanics waiting for parts and engineering on one aircraft would start work on another; as responses trickled in, they would bounce among planes in an attempt to stay busy and make progress somewhere.
- As work-in-process (WIP) grew, so did multitasking because mechanics and in-house workshops and support resources (especially engineers) had to deal with many aircraft instead of just one at a time.
- The resultant rushing and firefighting left no time to prepare fully before starting new projects, making multitasking even worse.
- As throughput declined, the carrier fleet's unchanging need for aircraft resulted in high-level pressure for the depot to bring in additional planes, which just exacerbated the problems.

## The Synchronized Planning and Execution Solution

Working with depot management, Realization implemented Critical Chain Project Management (CCPM) – a system of synchronized priorities in execution for all frontline and support resources:

- An analysis of Little’s Law revealed inadequate engineering capacity to support the carrier fleet’s demand. The Navy set a schedule to hire more engineers, and adjusted active WIP to pace production appropriately.
- The Navy has inserted “full-kit points” into the project plans to ensure that all long-lead-time parts and engineering analyses are in hand when needed. In addition, new and follow-on work begins only when sufficient labor and all needed parts and information are available.
- Flexible schedules now keep priorities current and aligned across the various departments and levels of the depot.
- At regular, structured meetings, teams rapidly identify issues that retard progress and quickly raise them to senior management. In this way, “blocking issues” receive strong focus and proper priority.
- Senior managers have access to metrics that allow them to rapidly identify project-level issues that threaten the entire portfolio. Thus, managers can respond before throughput targets are jeopardized.

## Results

- The Navy has created a plan to expand engineering capacity to maintain 30 aircraft per year – the level needed by the carrier fleet.
- Active WIP has been reduced from 36 aircraft to 17 aircraft.
- Annual throughput has increased from 6 aircraft to 11, an 81% improvement.
- The backlog of aircraft grounded for depot maintenance is on track to be eliminated in three years.
- Data-based planning is in place to increase the artisan and support capacity needed for expanding to 30 aircraft per year.
- A structure is in place for rapid escalation of issues that prevent progress, especially when they involve logistical capacity outside the depots’ control.

**If doing projects 20-50% faster is vital for your organization,  
contact us at [+1.408.271.5100](tel:+14082715100) to get started.**