Naval Synchronization Toolset Initiative

Problem Statement
The F/A-18 program was (and is) in a state of dynamic change. Multiple variables affect the availability and configurations of usable aircraft combined with the demands of those aircraft in USN and USMC operating units. On the demand side, the USN and USMC are in a double transition, moving squadrons from legacy F/A-18(A-D) aircraft to newer F/A-18(E/F) aircraft and from F/A-18 platforms to F-35 platforms. On the availability side, they are simultaneously planning SLEP efforts for all F/A-18 Type/Model/Series (A-D and E/F), drawing down A-D inventories (strike/store), and expanding the E/F inventory with additional procurements.

Solution Overview
The Naval Synchronization Toolset (NST) is a prescriptive analytics capability that allows the Naval Aviation Enterprise (NAE) (Resource Sponsors, Program Offices, Operating Forces) to take a forwarding-looking, data-driven approach to managing F/A-18 aircraft inventory. The power of prescriptive analytics is in modeling the "what-if," thereby providing decision support to resource and program managers as they transition F/A-18 squadrons, plan depot maintenance, plan for capability upgrades, design and execute the SLEP, and manage aircraft inventory (maintaining the optimal number of active aircraft in the face of shifting future demand).

Veracity Forecasting and Analysis, Inc. (Veracity) is the solution architect and lead integrator for the F/A-18 and EA-18G Program Manager's (PMA-265) NST initiative. Since 2013, Veracity has provided NST analytic forecasting services to the NAE to make fully informed, data-driven decisions for detailed SLEP plans, program acquisition strategies, depot capacity assessments, and readiness forecasts.

How It Works
The NST process is an enterprise planning behavior, assisted by a powerful modeling and simulation capability. NST incorporates authoritative operational plans, along with squadron aircraft assignments, depot-level modification and maintenance plans, historical execution factors (such as depot throughput levels) and required readiness standards. The outcomes of these plans can be evaluated, modified, and measured to achieve the desired level of aircraft availability. The final outputs include updated program plans and readiness measures. Numerous outputs can be captured, including unit-level aircraft availability based on programmed SLEP plans. The NST process is rigorous, repeatable, and generates a defensible program.

Key Accomplishments Based on NST Use
NST-based analysis has enabled the NAE and program managers to achieve significant cost, schedule, and performance improvements:

- PMA-265 and the NAE use NST to explore potential cost and readiness impacts of changes to USN and USMC future force structure. In a highly volatile budget environment (e.g., F-35), the NST's prescriptive analytics capabilities provide critical

insights into the location and magnitudes of future readiness risks. As decision makers consider high-stakes (and potentially irreversible) decisions regarding aircraft strikes and SLEP, they are aided by visualizations and summaries of complex analysis.

- Analysis of a key F/A-18 A-D SLEP component, known as the Center Barrel Replacement (CBR+), indicated that many programmed/scheduled events would not be necessary, given NST forecasts of future aircraft utilization and end of service life. This analysis led Commander, Naval Air Forces and PMA-265 to dramatically reduce the number of planned CBR+ events. These decisions led to cost avoidance of nearly $40M O&M funds between FY16–19 and freed over 375,000 man-hours of depot time.
- In FY16, program office, engineering support teams, and operational force planners used NST-based analysis to evaluate changes to planned depot maintenance (PDM) event timing and scope of work specifications. NST modeled outcomes were used to advise planners on how to delay PDM inductions by up to 1 year across the possessed aircraft, while also incorporating a reduced PDM specification that lowered overall non-possessed time for F/A-18 aircraft across the fleet. This effort increased near-term aircraft availability by over 10% within the legacy F/A-18 fleet (F/A-18A-D). Depots were able to address production backlog aircraft and avoid increasing production queues.
- Analysis of initial F/A-18 E/F SLEP (now referred to as Service Life Management) program designs (event inspection intervals, full kit availability dates, depot capacity for kit installs, and planned depot event lengths) indicated unacceptable levels of aircraft availability (excessive non-possessed time) for fleet operations during SLEP execution. This analysis led NAE leadership to direct a design review of the program. Its plan was subsequently reformulated to reduce fleet non-possessed time and to optimize the flow of aircraft through limited depot resources.
- Analysis of F/A-18 A-D aircraft progressing through (or in queue for) SLEP-related events illustrated that many aircraft currently inducted would not be needed to support future force structure requirements. This insight led the NAE to contemplate more aggressive plans to strike/store F/A-18 A-D aircraft, achieving cost avoidance and depot workload reductions without significant impacts to F/A-18 A-D availability.
- USN and USMC resource sponsors and program offices use NST-based forecasts for POM inputs and budget defense. NST is essentially a resources-to-readiness model showing the impacts of various aircraft procurement, PDM, and SLEP investment levels that map directly to unit-level availability outcomes. The NST-based outcomes are credible and defensible.

Summary

Veracity's analytic forecasting process has significantly improved planning, budgeting, and resourcing for the Department of the Navy. Veracity supports PMA-265 with analysis and forecasting for the F/A-18 and EA-18G T/M/S families using robust prescriptive analytics.

Point of Contact

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