

PRODUCT APPLICATION

UAV Mission Operation and Support Life-Cycle Assessment Technology, Products and Services

Introduction and Benefits

Clockwork Solutions is introducing new products and services designed to assist in the management of Unmanned Aerial Vehicle (UAV) systems. Based on powerful SPAR™ simulation technology, the ATLAST™ aviation fleet life-cycle management application, and unique models built specifically for UAV systems, these new technologies can significantly reduce life-cycle costs and improve performance of a UAV asset or series of assets.

Decision makers using these tools can expect great benefits thanks to Clockwork's integrated systems modeling approach. Modeling mission operation and logistics support at the early stages of the UAV fleet life-cycle will help reduce life-cycle risks, forecast readiness and O&M performance by aircraft and by flying location, and verify performance prior to implementing revised sustainment initiatives. Clockwork's system-wide approach to modeling enables quantifying life-cycle costs and impacts due to management decisions regarding equipment configuration changes, remaining-life rules modifications, alternate sparing strategies, adjusted flying hour programs, modified repair concepts, and age/reliability factors, while simultaneously discovering opportunities to reduce costs and improve overall asset performance.

Applications include:

- Reliability modification impacts (How we build/configure)
- Deployment strategy assessments (How we operate)
- Maintenance concept modifications (How we maintain)
- Supply chain alternatives (How we supply/stock/pre-position)



Features include:

- Software application based on SPAR™ simulation technology foundation
- Database structure provides for plug-ins and simulation of numerous systems and platforms
- Provides “what-if” simulation scenario management for analysis of life-cycle sustainment forecasts
- Mission fulfillment model pre-built
- Baseline operations and maintenance model pre-built
- Tracking and record keeping by group, part number or serial number
- Phased induction scheduling or causal failure demand
- Statistical aging distributions fit and manipulated by assembly, location, and repair number
- Indenture structures/hierarchy integrity
- Initialized “State” of system and component

- Implicit life limit vs. causal removal event management
- Operations variations by location
- Part interchangeability/substitutability rule manipulation
- Repair capacity constraining
- Cycle time control (repair/transportation/order lead time)
- Up to 3-level maintenance concept
- Time-dependent outputs



Predicted output metrics include:

- Mission accomplishment
 - Time on target
 - Availability over target
- Readiness
 - Time on wing (TOW)
 - Availability
 - Achieved flying hours
 - Cumulative age
- Supply
 - Percent of time awaiting parts
 - Average time awaiting parts
 - Spares levels
 - Spares unavailability
- Maintenance
 - Removals
 - Workload to depot
 - Condemnations at depot
 - Tasks performed
 - Percent of time awaiting maintenance
 - Average time awaiting maintenance
- Cost
 - Operations and Maintenance (O&S)
 - O&S per flight hour

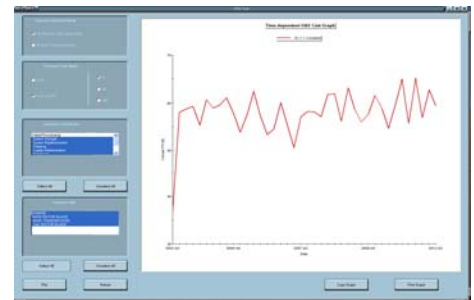


Conclusion

The experience gathered so far clearly shows that introducing long term predictive modeling in the earlier stages of feasibility planning and deployment of the UAV fleet will significantly affect management decisions in regard to reducing life-cycle sustainment costs without adversely impacting fleet readiness and availability. Clockwork Solutions UAV products and services are applied for predicting performance metrics of operations, maintenance and supply for the UAV asset or series of assets. They provide an integrated systems approach to modeling the dependencies between an asset's ability to achieve desired operating hours and the ability of the repair and supply capabilities to respond to the demands resulting from those operations.

SPAR™ and ATLAST™

SPAR™ is Clockwork Solutions' modeling and simulation technology for predicting system behavior in order to reduce asset ownership cost and increase performance. SPAR™ models are based on statistics and rules that define, at a detailed level, how elements of a system and its support infrastructure behave dynamically in time. By modeling the details of element behavior and the relationships between elements such as reliability, maintenance and supply, performance of large, complicated systems and their operation and logistic environments can be predicted accurately. ATLAST™ is a custom application built on top of the SPAR™ simulation platform. Most of the aspects relating to the creation of a comprehensive aviation fleet management model have been designed and incorporated into ATLAST™. Users must only concern themselves with changing inputs under analysis, running simulations, and evaluating impacts.



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