Autonomic Logistics Information System (ALIS) Overview

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ALIS Is an Integral Part of the Air System – Is NOT on the Air Vehicle

ALIS Integrated Services

ALIS Is the Key Operations and Maintenance Management System

- Warfighter – Mission Planning, Scheduling, Qualifications
- Operations Management – Aircraft and Personnel Records, Maintenance Vehicle Interface, Tech Data, Support and Test Equipment, Low Observable Health, Work Orders
- Sustainment Support – 24/7 Customer Support, Sustaining Engineering, Performance Based Logistics Management
Original Program Approach

- **Mission Decomposition**
  - One squadron/One SOU
  - Provided the operational threads
  - Mission Phases (Section 4.0)

- **Non-Disclosure Policy**
  - US Government/JPO Direction
  - DoD Policy states that differences between country configurations cannot be disclosed
    - Makes part numbers NDP
      - Requires physical separation of data
      - Shared parts exacerbates the issue

- **Disconnected Operations**
  - Must operate disconnected from enterprise for 30-days

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**AL Mission Decomposition**

- **Support Activities (24 x 7)**
  - Perform Pilot Signoff
  - Initiate PHM Downlink
  - Process PHM Data
  - Perform Mission Debrief
  - Operational Pilot Training
  - Generate Work Order Autonomically
  - Generate Flight Schedule
  - Perform Mission Planning
  - Generate Maintenance Schedule
  - Perform AV / SE Maintenance
  - = ALUCs
  - = TLUCs
  - Write PMD
  - Read PMD
  - Process PHM Data
  - Update Data Repository
  - Process Pilot's Training
  - Perform AV / SE Maintenance

**ALIS Must Function At the Point of Maintenance While Disconnected**
ALIS System Architecture Hierarchy

ALIS Is a Hierarchical Infrastructure Supporting Multiple Countries

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Current State

• **Deployed**
  ◦ Supporting operations for USMC
  ◦ Deployed to flight test and operational test sites
  ◦ Deployed to training sites
  ◦ Will deploy to USAF 7/16
  ◦ Partner deployments beginning 2016

• **In Development**
  ◦ Still in system development
  ◦ Block 4 will add additional capabilities
  ◦ Performance Based Logistic concepts continue to develop
    - Sovereign Data
    - Mixed Data

*Challenge – Manage SW Baseline Changes With Deployed System*
Concerns

• 40 year program
  ◦ COTS Based frequent updates and obsolescence

• Continuing data changes
  - Program is maturing
  - Capabilities being added

• Supporting existing systems
  ◦ Latency of changes to updates in partner and deployed systems
Focus Areas

• Consider sustainment costs during acquisition
  ◦ Focus during acquisition is on development costs and COTS acquisition costs
  ◦ 80% of program cost comes during sustainment
  ◦ F-35 ALIS will spend millions on sustainment support with current infrastructure
  ◦ Less reliance on COTS SW will typically improve DMS and tech refresh cycles

• Look for common models across services
  ◦ F-35 is multi-service/multi-country
  ◦ We are experience the uniqueness of these different stakeholders
  ◦ Work towards a “purple” solution for data and processes for interoperability
    - Forward and backward data versioning/message versioning required
    - Common semantics needed
  ◦ Make solutions tool agnostic

Data and Business Rules Should Be Immutable Over Time
Session Issues

- 10 USC 2464 refers to core depot capabilities. Define the elements of software core capabilities for the DoD?
  - ALIS provides the core software capabilities to provide asset visibility
- Does the DoD need to have a ready and controlled source of repair for COTS software modified for military use? Yes
  - Does that include the underlying source code? Only for the developed SW. COTS does not provide source code
- Is cyber a core workload and how should we sustain cyber systems?
  - Suggest less reliance on COTS due to lifecycle sustainment costs
- What is DoD’s strategy to modernize the aging, outdated information technology maintenance/logistics systems used at the depots?
  - For F35, DMS approach and infrastructure design with regular tech refresh
- Across the services, we have several enterprise systems that provide HW asset visibility. Shouldn’t we have similar systems for software visibility?
  - ALIS maturing to provide aggregated SW configuration status for all deployed systems
- What are the challenges associated with embedding a small team of organic engineers with the OEM to facilitate building a lasting partnership?
  - Length of program development typically outlasts the tenure of organic engineers
  - F35 is using Joint Program Office in that role, but most are not SW knowledgeable and are not SMEs in the logistics concepts
Session Issues

• How can the services’ software organizations and staffs work together and eliminate the stovepipes?

• Should there be a cyber force for software?

• What are best metrics for measuring software reliability?
  Defect count, rate of open vs closed, uptime

• The COCOMS demand interoperability across systems. As a result, should we manage and sustain software or sets of software that operate interdependently together?
  Not software interoperability itself, but data interfaces and semantics; the data and business rules should be immutable over time, software can and will change

• Is there a rule of thumb for estimating the cost of sustaining/maintaining a software system?
  Cost is dependent on the quality of the core SW, team developing/maintaining SW and the technology used. Technology becomes obsolete, teams tend to turn over.

• How should we address software security during software sustainment?
  Big issue; F35 is not under contract for Risk Management Framework (RMF) yet DoD is forcing it rapidly. This is 15 years after the program as awarded. This could not be foreseen. COTS is a vulnerability; consider more developed SW (mission specific)