F-22 Program Office

Dominant Air Power: Design for Tomorrow…Deliver Today

F-22 Software Management Strategy

Software Maintenance Growth/Opportunities and Challenges Panel, DoD Software Maintenance Conf

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U.S. AIR FORCE
Purpose/Overview

- Purpose: Information Only
- What is F-22 SW Management?
- Why Consider In-Sourcing?
- Background Studies
- Consolidation Plan at Ogden Air Logistics Ctr
- Summary
What is F-22 SW Management?

- **Software Life Cycle Management (SLCM)**
  - Development and Sustainment of F-22 software throughout the life of the airframe
    - Who does this today? Lockheed, Boeing & Subcontractors
    - How should we develop organic capability?
  - F-22 is software intensive
    - Integration Avionics
    - One Operational Flight Program
  - Originally only on-acft (OFP) software was considered
    - Training Systems
    - Aircraft Maintenance System
Why Consider In-Sourcing?

Law: USC Title 10 Sec 2464
- DoDI 4151.20 requires software to be reported in the Biennial Core Computation provided to OSD

What is Core?
- It is the Air Force position that software required to launch, recover, and maintain AF weapon systems is to be considered a Core capability and must exist organically within the software design, architecture and integration activities of an individual weapon system
  - Must be done by gov’t people, using gov’t equipment, in a gov’t owned and operated facility

50/50 – at least half of all depot-level work (by dollar amt) must be performed in a gov’t facility
Background

- F-22 Software workload declared Core (Sep 02)
- 5 studies conducted from 2005 to 2010 to gain organic capability
  - No clear low cost alternative that met all stakeholders needs
- Consolidation of labs at Prime Ft Worth location proposed
- Jan 11 planning fell apart with prime decision not to play
  - “Business case driven”
- Feb 11 Program office initiative to consolidate at Ogden ALC
  - Forced quick reaction with limited planning to maintain capacity
  - Budget driven – no overnight solution
  - Did allow an opportunity to make small improvements to lab
    - Need more in-depth planning going forward
Starting SW Management Environment

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Boeing, Seattle
Sys Design
MSW, PTS
Avionics Integration Lab (AIL)/Flying Test Bed (FTB)

Raytheon, LA
Core

Northrop Grumman, Baltimore
RADAR

Honeywell, Toronto, Canada
ECS

BAE, Nashua, NH
EW

Northrop Grumman, San Diego
CNI

GD4CS, Scottsdale
Crypto

Northrop Grumman, Woodland Hills
GINS

Lockheed, Marietta
Sys Design
PVI, ADM
MAS (ASM, CMW...)
U&S, DMVR
Raptor Integration Lab (RaIL)

Lockheed, Fort Worth
COMM, SMS
U&S / IVSC
IMIS

Primes

Suppliers

No Organic Capability
Step 1: Move Raptor Integration Lab (RaIL) to Ogden ALC

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Sys Design, PTS, Avionics Integration Lab (AIL)/Flying Test Bed (FTB)

Honeywell, Toronto, Canada
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BAE, Nashua, NH
EW

Northrop Grumman, Baltimore
RADAR

Lockheed, Fort Worth
COMM SMS U&S / IVSC

GD4CS, Scottsdale
Crypto

Northrop Grumman, San Diego
CNI

Lockheed, Marietta
Sys Design PVI, ADM MAS (ASM, CMW...), U&S, DMVR Raptor Integration Lab (RaIL)

Training -Ogden folks on RaIL -Ogden team at Seattle for AIL

Northrop Grumman, Woodland Hills
GINS

Northrop Grumman, San Diego
GINS

Raytheon, LA
Core

Primes
Suppliers
ALCs

RaIL Initial Operating Capability - Oct 2012
Step 2: Consolidate OEM SW Development IPTs at Ogden

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- Raytheon, LA
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- Northrop Grumman, Woodland Hills
  - GINS

- Northrop Grumman, San Diego
  - CNI

- Honeywell, Toronto, Canada
  - ECS

- BAE, Nashua, NH
  - EW

- Northrop Grumman, Baltimore
  - RADAR

- Lockheed, Marietta
  - Sys Design

- GD4CS, Scottsdale
  - Crypto

- Lockheed, Fort Worth

**OO-ALC**
- Move OEM Software IPTs, Raptor Integration Lab (RaIL)

**OC-ALC**

**WR-ALC**

- Timing: 2014 to 2020
Step 3: Move AIL and Team to Ogden

Timing: 2015 to 2017
Summary

• Long twisted path to present plan
• More planning and use lessons learned going forward
• Leverage the best of public and private sector
  – Prime experience with F-22 avionics and software
  – Ogden recognized software excellence (CMMI level 5)
  – Fresh start with opportunities to make improvements
• Challenges galore
  – Must have clear communication
    • Multiple locations
  – Must have clear expectations
    • Increase planning for future steps
    • Train organic team with clear target workload
  – Preserve human capital
    • Keep contractor team producing while growing organic team to the 50/50 target