Software Sustainment:
Challenges and Solutions

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F-35 Multi-Mission Capability

**Destroy Targets Deep in Enemy Territory**
- Air Interceptor
- Stealth
  - Ability to go undetected
- Strategic Attack
- MOB SAM
- MOB SAM

**Protect Ground Troops Engaged in Combat**
- VMF
- Close Air Support
- Interoperability
  - Pass vital information and data to all US legacy platforms

**“Knock Down the Door” for Other Platforms**
- Tactical SAM
- Suppression/Destruction of Enemy Air Defenses
- Sensor Fusion
  - Combine many sources of info

**Clear the Skies of Enemy Aircraft**
- FLOT
- Air Superiority
- Stealth
- Interoperability
  - Makes Everyone in Battlespace Smarter

**Stealth**
- Ability to go undetected

**Sensor Fusion**
- Combine many sources of info

**Interoperability**
- Pass vital information and data to all US legacy platforms

- Maneuver at Will Throughout Battlespace
- Provides Superb Battlespace Awareness

Survivable Against World’s Most Sophisticated Threats Now and in the Future

Critical to US and Allied Air Dominance for the Next 50 Years
F-35 Weapon System Overview

F-35A
Air Force - 1763
Internal Gun
Boom Refueling
Conventional Take-off & Landing
- Italy Air Force - 60
- Turkey - 100
- Canada - 65
- Australia - 100
- Denmark - 27
- The Netherlands - 37

F-35B
Marine Corps - 353
Lift Fan
Basket Refueling
Centerline Gun Pod
3-Bearing Swivel Nozzle
Roll Posts
Short Take-off Vertical Landing
- United Kingdom - 138
- Italy - 30

F-35C
Navy - 273 & Marine Corps - 67
Basket Refueling
Stronger Gear & Tailhook
Wingfold & Ailerons
Larger Wing & Tail Area
Aircraft Carrier Variant

F-35 Program More than Just the Aircraft
- Conventional Take-off & Landing
- Short Take-off Vertical Landing
- Aircraft Carrier Variant

1 Program / 3 Variants / 14 Customers / 3,197 Aircraft
Big, Complicated Program with Significant Allied Participation
The F-35 Air System

...More than Just the Aircraft

Air Vehicle

JSF Reprogramming

Enterprise

Autonomic

Logistics Information System

Full Mission Simulators

Operational Flight Program

Mission Data File

Off-Board Mission Support

Threat Database
F-35 Sustainment Challenges

• F-35 Global Sustainment Solution is designed to support the requirements of all Participants and FMS
  ◦ 3 US Services
  ◦ 8 Partner Nations
  ◦ A Growing Number of Foreign Military Sales Customers

• Must deliver:
  ◦ Most cost-effective system for all
  ◦ Best Value for all Participants

• Must recognize and address any specific requirements from individual services and attribute costs accordingly
Scope of F-35 Software Sustainment

- Mx and Aircrew Trainers
- Modeling & Simulation
- Off Board Mission Support
- Propulsion
- Autonomic Logistics Information System
- Avionics
- Prognostic Health Management System
- Weapons
- Software Labs
- Reprogramming Labs (x4)

Across Development, Production, and Sustainment
F-35 Sustainment Solutions

- F-35 Global Support Solution (GSS) is designed to support the requirements of all Participants and FMS

The F-35 Global Support Solution will deliver sustainment through life with the support of the US Services, Depots, Global Industry and the associated supply chain network.

The F-35 Program is more than just the aircraft and successful sustainment needs to address ALL the on-board and off-board needs.
Across Three Regions

North America
- US Government CORE Workload Assigned in Sep 2008
- Production/FACO Program of Record
- Airframe Assignments Made Dec 2014
- Engine Assignments Made Dec 2014

Europe
- Components Assignments Initial 65 in 2016, RFI 2017
- Supply Warehouse Assignments made in 2017
- Europe Region Component Initial: (2022-2026)
  - UK: RTC A, B1, B2, C, E, F, H, X, S(2026)
  - NLD: RTC G, L
- Norway Engine
- Europe SE / ALIS / Training Devices
- Europe Warehouse
- Turkey Engine
- Japan Airframe (F-35A)
  - Nagoya
- Japan Engine
- Japan FACO
- Asian Pacific Region Component Initial: (2026-2030)
  - KOR: RTC X

Pacific
- California FACO
- Australia Airframe (F-35A)
- Pacific SE / ALIS / Training Devices
- Australia Engine
- Norway Engine

SE/ALIS/Training Device Assignments To be made 2018
- Japan FACO
- Italy FACO
- SE/ALIS/Training Device Assignments To be made 2018
- Supply Warehouse Assignments made in 2017
- Europe SE / ALIS / Training Devices
- Europe Warehouse
F-35 Global Support Solution (GSS)

Legacy

Separate Enterprises

- USAF
  - SE
  - Spares
  - Training
  - Engineering
- Country X
  - SE
  - Spares
  - Training
  - Engineering
- Country Y
  - SE
  - Spares
  - Training
  - Engineering

Contracting for Things

- Buy:
  - Replacement of 12 Rotors
  - 30 Repair Inductions
  - Train 20 engine techs

Traditional Cost Growth

- O&S Cost

Acquisition Strategy

- Deliver Warfighter performance capability within resource constraints

Sustainment Strategy:

- Design, develop, deliver and sustain a single, integrated, Global Support Solution (GSS);
- Tailor GSS to meet warfighter-defined and PSM-informed readiness and cost objectives;
- Maintain life cycle focus, including the reduction of costs;
- Create a mutually-beneficial GSS enterprise that – with relevant metrics and incentives – operates, manages, and supports the global system; and
- Leverage global resource base

30% O&S Cost Reduction

F-35 GSS Model

Common, Tailored Enterprise

- 3 US Services
- 8 Int'l Participants
- 3 FMS Cases

Common Pool:

- SE
- Spares
- Training
- Engineering

Unique Rqmts:

- Afloat Spares
- Deployable Spares
- Country-Specific (ISR, etc.)

Contracting for Outcomes

Buy Required outcomes with incentives:

- Strategic Performance Measures; e.g., Safety
- Key Performance Indicators: Air Vehicle Availability (AVA), Full Mission Capability (FMC), Mission Effectiveness (ME), Cost
- Critical Metrics: MMH/FH, Canns, System Health Indicators

Performance Framework

- Bend the curve using:
  - Performance-based contracting
  - OEM Investments
  - Should Cost

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Questions

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Delivering the F-35 to the Warfighter