F-35 Sustainment

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Aircraft Airworthiness and Sustainment Conference

Brisbane, Australia
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LOCKHEED MARTIN
Lockheed Martin Australia Pty Limited
(ABN 30 008 425 509)

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Lockheed Martin Aeronautics

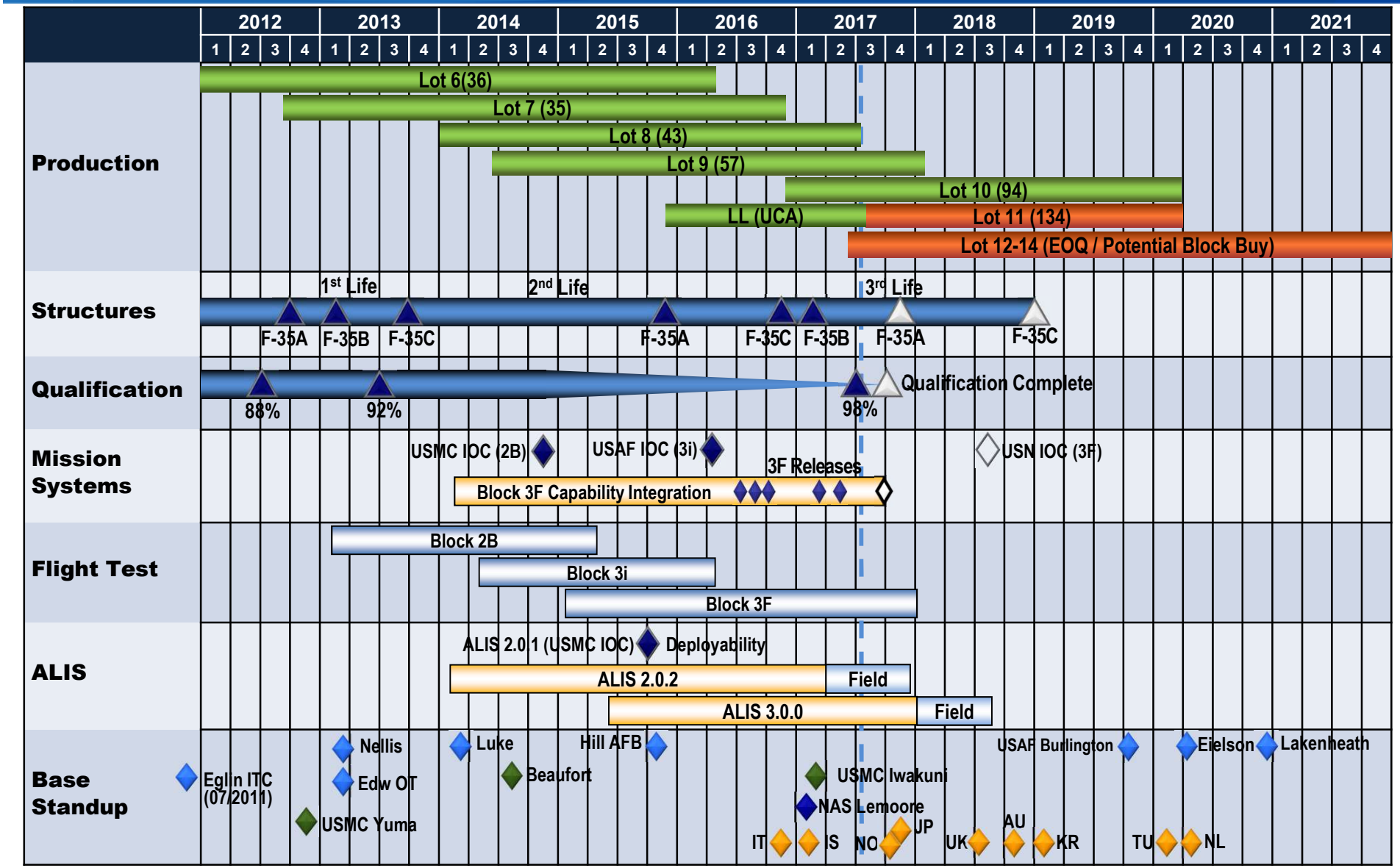
Presentation Topics

- **Program Overview**
- **Australian Industry Partnerships & Contributions**
- **Sustainment Performance Optimization**
- **Global Sustainment System**
- **Lifecycle Cost Reduction**

F-35 Value Proposition

F-35 Integrated Overview

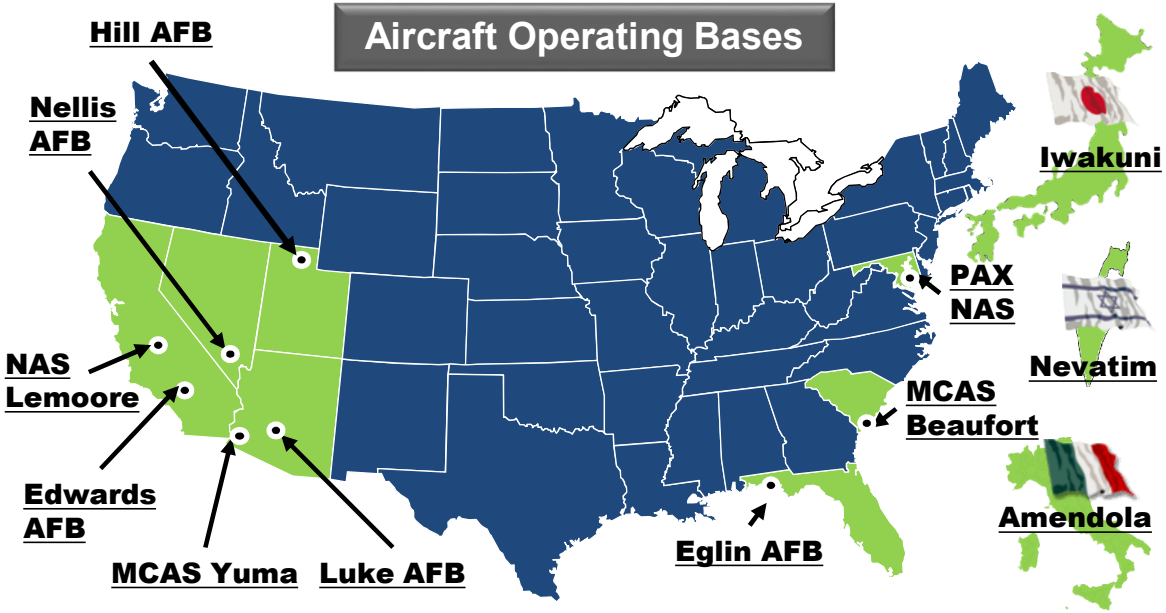
As of ME May 2017



F-35 Sustainment World Wide

Training

Aircraft Operating Bases



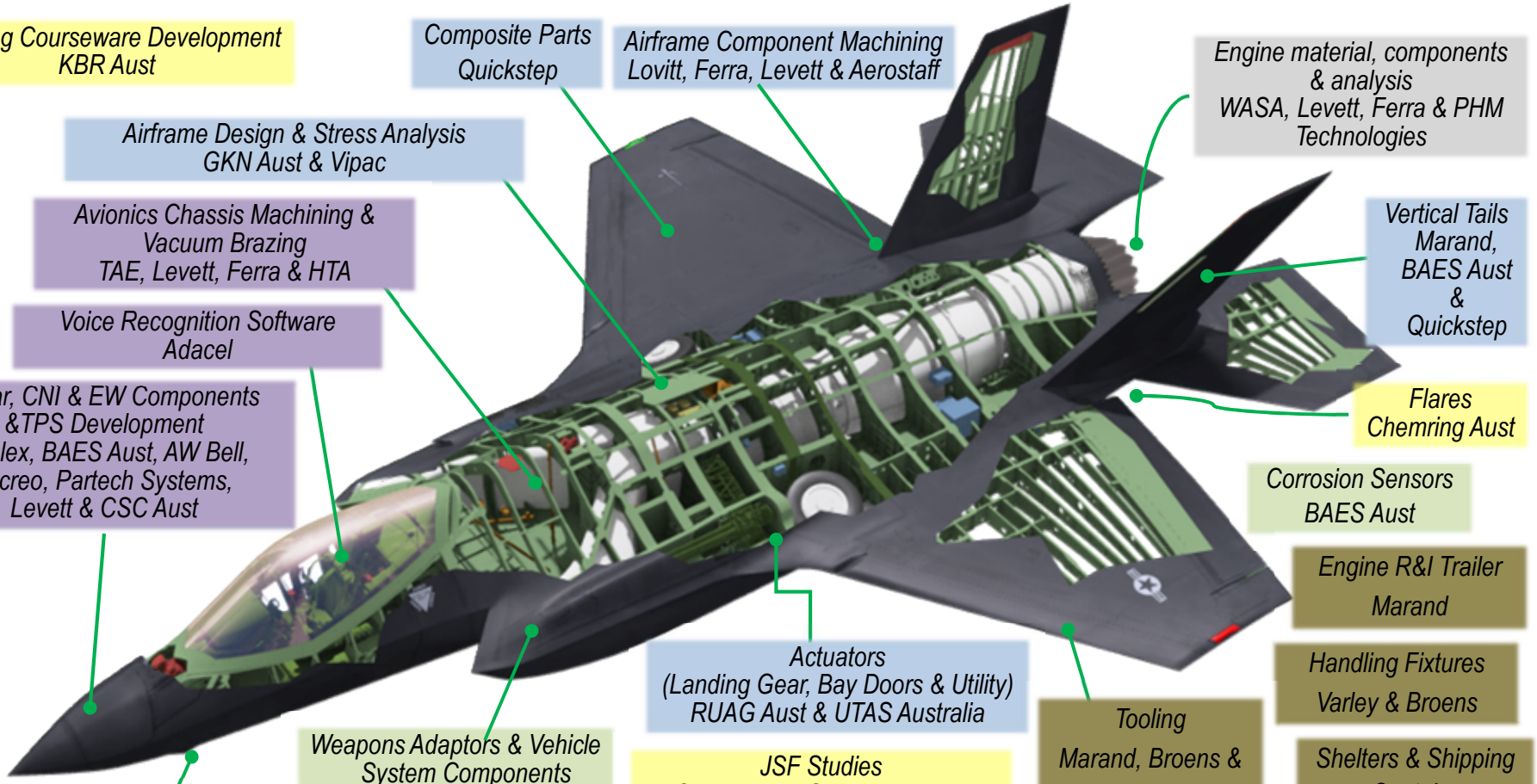
Mods

Support

Supporting Over 220 F-35s at 12 Bases Today

Australian Industry Production Participation

Airframe	Vehicle Systems	Mission Systems	Engine Systems	Support Equipment	Others



Training Courseware Development
KBR Aust

Composite Parts
Quickstep

Airframe Component Machining
Lovitt, Ferra, Levett & Aerostaff

Engine material, components & analysis
WASA, Levett, Ferra & PHM Technologies

Airframe Design & Stress Analysis
GKN Aust & Vipac

Avionics Chassis Machining & Vacuum Brazing
TAE, Levett, Ferra & HTA

Vertical Tails
Marand, BAES Aust & Quickstep

Voice Recognition Software
Adacel

Radar, CNI & EW Components &TPS Development
Cablex, BAES Aust, AW Bell, Micreo, Partech Systems, Levett & CSC Aust

Flares
Chemring Aust

Corrosion Sensors
BAES Aust

Engine R&I Trailer
Marand

Handling Fixtures
Varley & Broens

Actuators
(Landing Gear, Bay Doors & Utility)
RUAG Aust & UTAS Australia

Tooling
Marand, Broens & Hofmann Metaltec

Shelters & Shipping Containers
Varley & Trimcast

Weapons Adaptors & Vehicle System Components
Ferra

JSF Studies
Calytrix, BAES Aust, Marand, Qinetiq Consulting and Ball Solutions Group

Electro Optical Components
Rockwell Collins Aust & AW Bell

Engineering support
Thales Aust

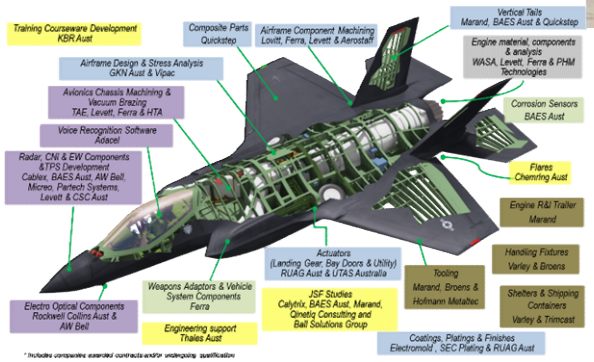
Coatings, Platings & Finishes
Electromold , SEC Plating & RUAG Aust

** Includes Historical and Current Contract Awarded and/or Companies Undergoing Qualification*

Lockheed Martin in Australia...More Than F-35

Sikorsky MRO

Australian-based Sustainment Services for Military and Commercial Rotary Wing Platforms in Australian and the Asia-Pacifc



Deployable Air Operations

Lockheed Martin Teaming with Varley

STELaRLab

First LM R&D Centre Outside USA Supporting PhD STEM Research

C-130J Sustainment

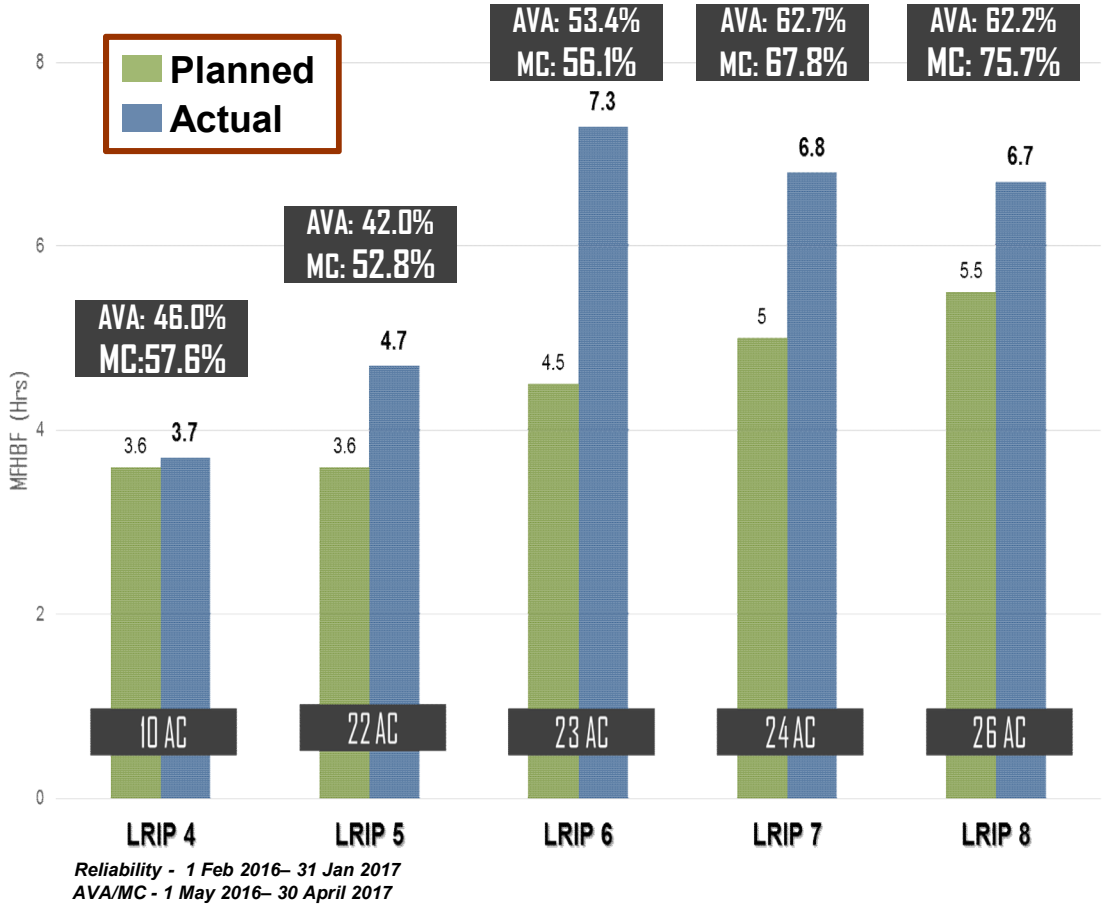
Australian-based Supply Chain Integration and Field Service Team

Over 3,600 People Employed in Australia on LM-led Programs

5th Generation Performance

LO Stealth - Fighter Performance - Integrated Sensor Fusion – Net-Enabled Operations – Advanced Sustainment

F-35A Reliability and Availability by LRIP



Reliability - 1 Feb 2016– 31 Jan 2017
AVA/MC - 1 May 2016– 30 April 2017

Later LRIPs Yielding Better Performance

RAAF F-35 Field Performance

RAAF Fleet at Luke AFB (Dec '14 – May '17)

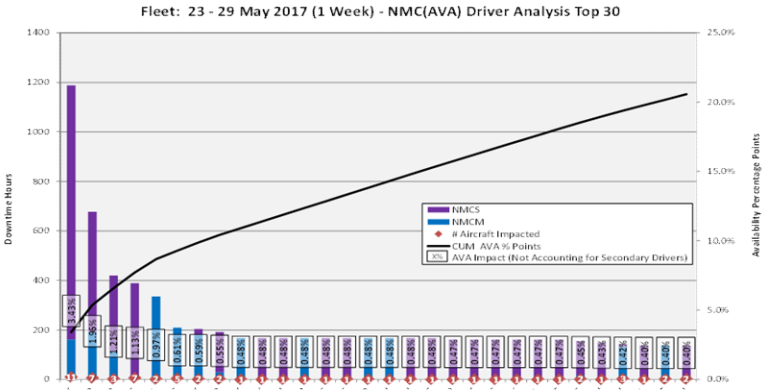
- Avg Aircraft Availability – 65.8%
- Avg Mission Capable Rate – 67.4%
- Avg Mission Effectiveness – 94.1%
- Flown 591 Sorties for 1068 Flt Hours

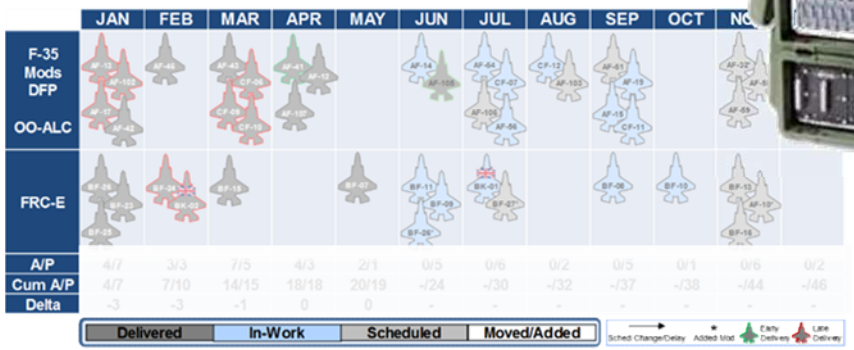
RAAF Deployment to Avalon

- 100% AVA
- Flew 17 Sorties for 85.8 Flt Hours

Designed For Sustainability

- **Basic Design for Increased Maintainability**
  - *Simplified Low Observable System and Maintenance*
  - *On-Board Diagnostics System with Off-Board Prognostic Maintenance Optimization*
- **Pooled Global Fleet Resources – Economies of Scale**
  - *Common Aircraft Configuration*
  - *Common Spares and Support Equipment Pool*
  - *Global Repair Network for Airframe and Components*
- **ALIS – Single Logistics IT System**
  - *Supporting Mission Planning/Debrief, Maintenance & Training Tasks and Fleet Management*
  - *Foundation for Sustainment Performance Analytic Data Fusion*
- **2 year FOM Cycle to Maintain Combat Edge Through-Life**
  - *Software Update Every 2 Years / Hardware Update Every 4 Years*
  - *Optimized Global and Regional Depot Flow Planning*





Global Scale Enables Long Term Continuous Improvement

RAAF Supply Chain Composition

Global Pooled Inventory

Main Operating Base

Fwd Deployed Base

GSP

Global Spares Package

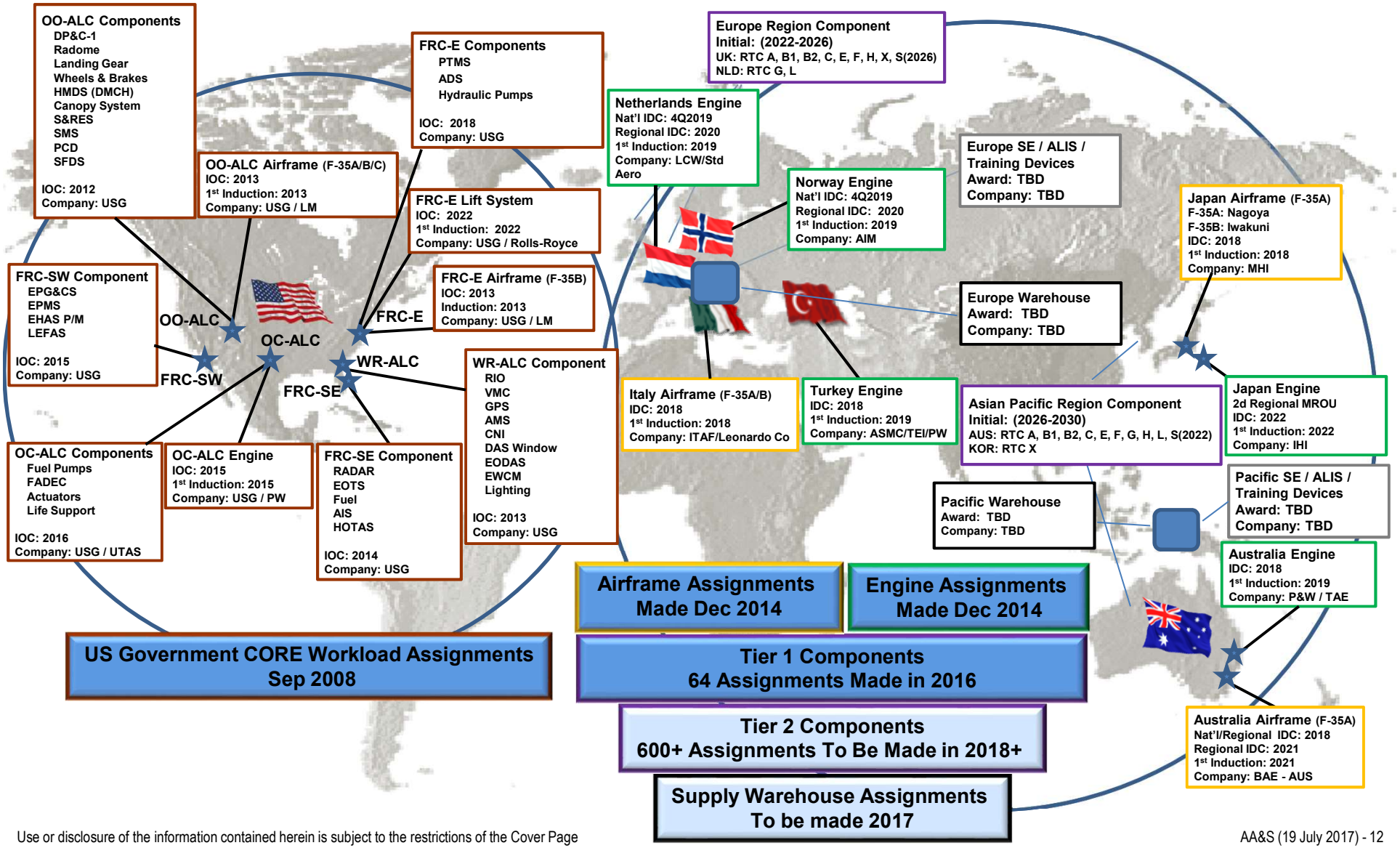
2 BSPs

Base Spares Package

2 DSPs

Deployed Spares Package

Current Global Sustainment Posture



Australian Industry Sustainment Participation

Tier 1 Aircraft Components
64 Components
Assignments Made in 2016

Avionics LM STAR
Tier 1 Asia-Pacific:
Northrop Grumman
BAE, GE
Rockwell Collins

Electrical
Tier 1 Asia-Pacific:
Northrop Grumman
BAE

Structural Components
Tier 1 Asia-Pacific:
Northrop Grumman
BAE, Quickstep

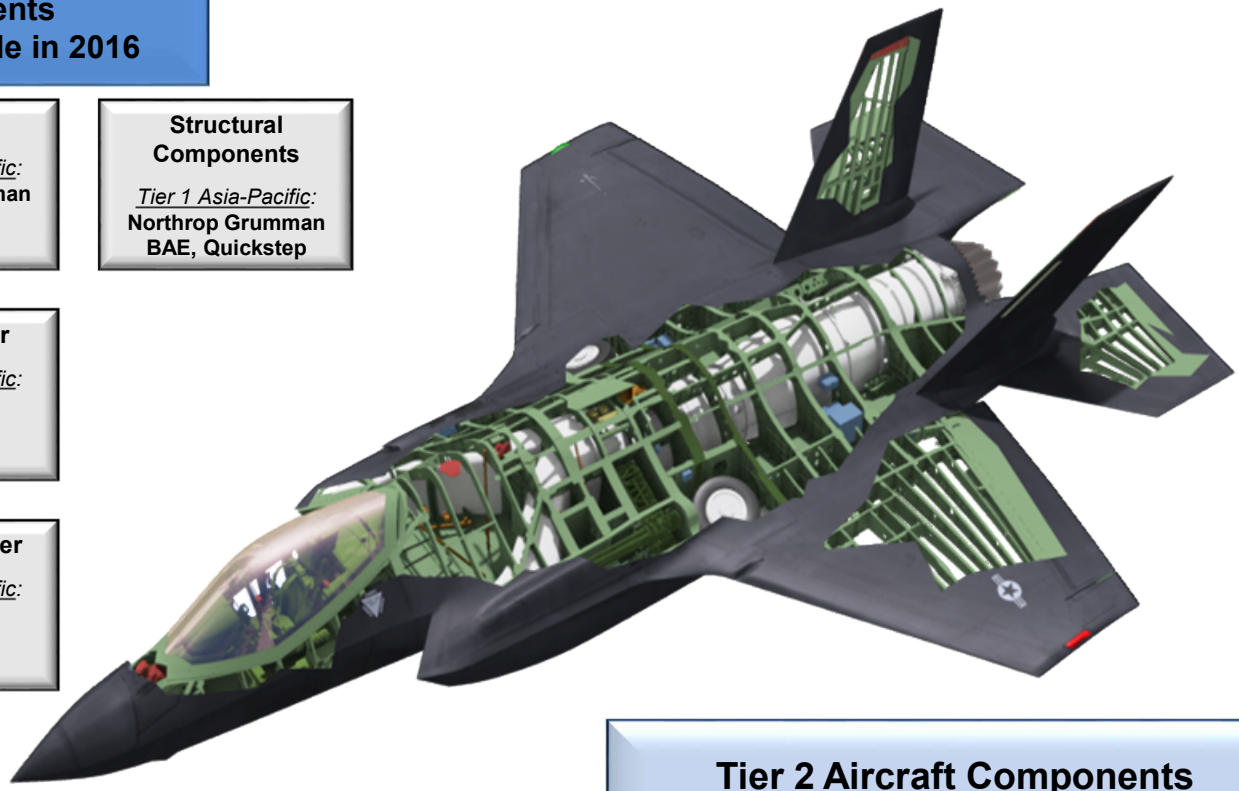
Valves
Tier 1 Asia-Pacific:
RUAG
HI Fraser

Landing Gear
Tier 1 Asia-Pacific:
RUAG

Hydraulic / Pneudraulic
Tier 1 Asia-Pacific:
RUAG

Auxiliary Power
Tier 1 Asia-Pacific:
RUAG, TAE,
HI Fraser

Life Support
Tier 1 Asia-Pacific:
BAE
Martin-Baker

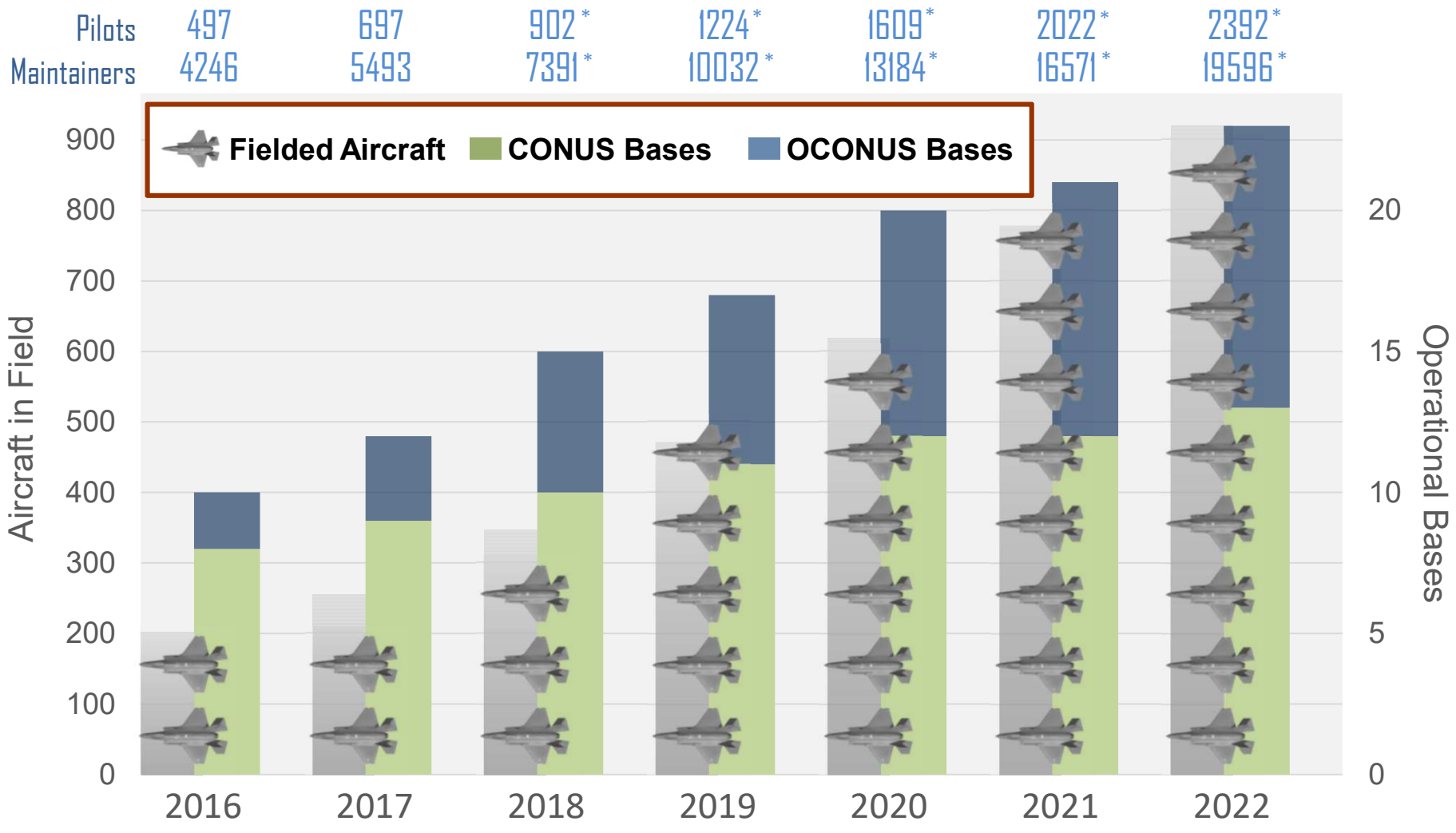


Tier 2 Aircraft Components
600+ Component
Assignments To Be Made in 2018+

HPSI-Contracted Regional Repair Network Delivers Global Availability, Repair Throughput and Affordability

F-35 Sustainment Growth Through 2022

Preparing for Long Haul Sustainment



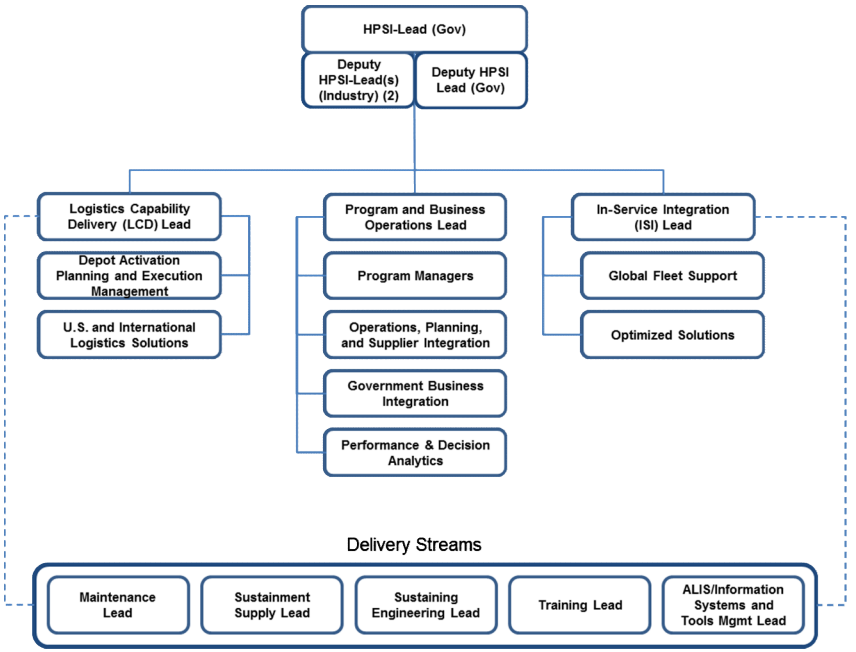
Exponential Growth Requires Focused Sustainment Approach

*Forecasted Number

Hybrid Product Support Integrator Structure

Government-Industry Sustainment Model

- **Aligns Outcomes, Incentives, Authority, Risk**
- **Principles**
  - *Outcome Based*
  - *Single Point Accountability*
  - *Agile*
  - *Partnership: Industry – Government – Warfighter*
  - *System Expertise: Avionics to ALIS*
  - *Economies of Scale, Market Leverage: Production – Development – Sustainment*
  - *Opportunity to Invest, Earn*



- **Value Proposition Delivers Performance, Affordable Outcomes**
  - *Aircraft Availability (AVA)*
  - *Full Mission Capability, Effectiveness*
  - *Cost Reduction*

LOCKHEED MARTIN · BAE SYSTEMS INSPIRED WORK · NORTHROP GRUMMAN · Pratt & Whitney A United Technologies Company · Rolls-Royce

F-35 HPSI Organization is Effective Model for Government/Industry Teaming

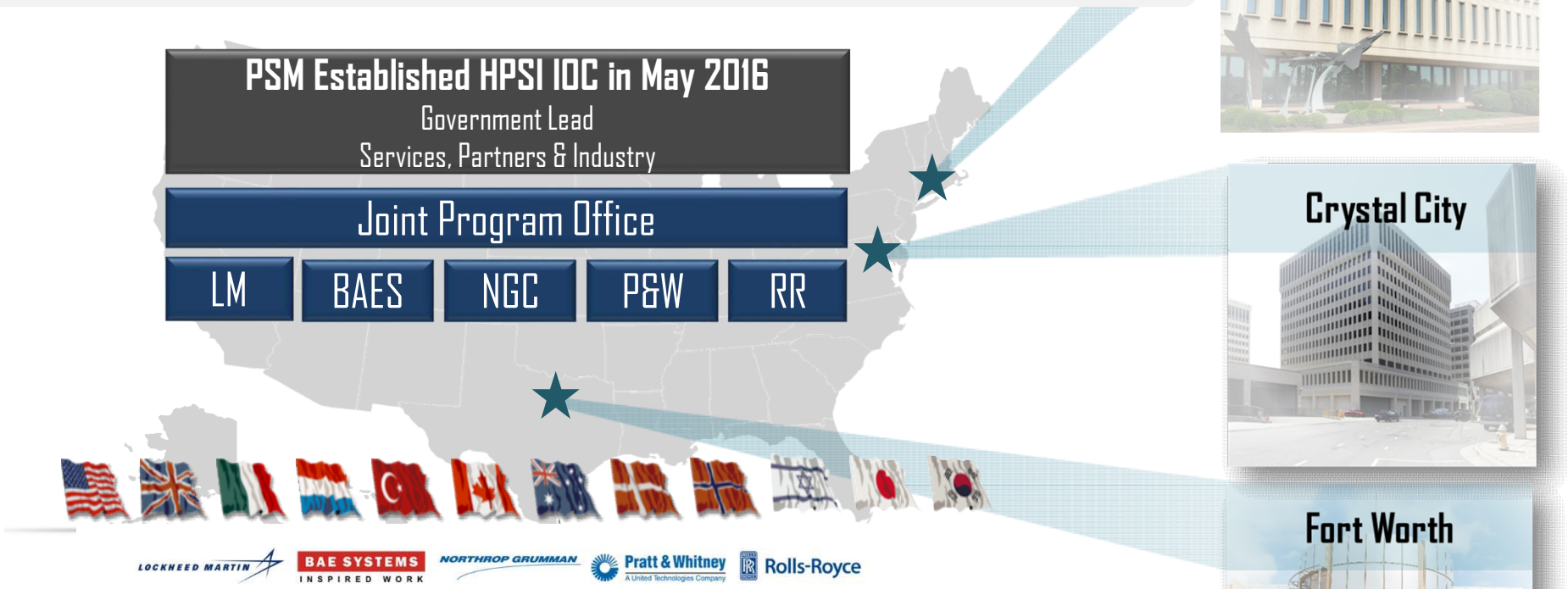
HPSI Progress

Organizational Governance & Operations

F-35 Enterprise Committed to GSS Design Implementation

Enhanced Collaboration as a Single Team; Gov't – Industry – Warfighter

Shared Vision, Mission and Objective



Established HPSI Facilities, Aligned Roles, Accountabilities & Authorities

Maturing to Reach FOC by 2019

Continuous Development to Reach Full Global Integration

National Air System Management

HPSI

Global Support Solution

- 24/7/365 PSI Center
- Action Requests
- Design Engineering
- Sustaining Engineering
- Supply Chain Management
- Global Supply Support
- Continuous Improvement

Air Combat Group / Air Combat SPO

- Financial Management
- PBL Mgmt. & Monitoring
- Airworthiness
- Fleet Management
- ALIS Mgmt., Ops., & Support
- Training – Ops, & Support

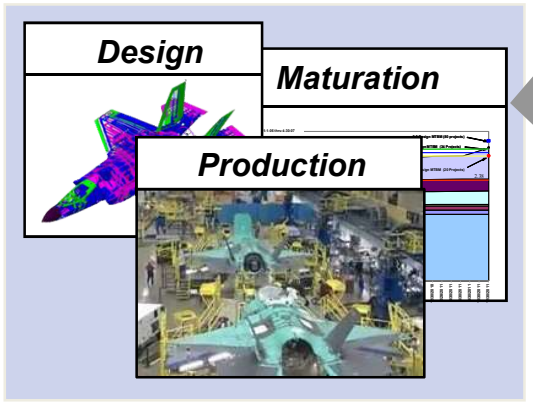
Local Industry

Defence Organizations

RAAF F-35 Operating Units

In-Country Support of National Fleet by National Personnel

Single, Integrated Product Support



Full Spectrum

Availability

Field Performance Issues Requiring Engineering

Systems Integration

Product Development

- Systems Engineering (Safety, Materials, Risk Mgmt, etc)
- Chief Engineer
- Air Vehicle Systems & Software
- Air Vehicle Structures

Engineering Labs

- OEM Source of Supply
- Spares and Repair forecasting
- Class II Supplier Changes

All Air Vehicle & Sustainment Systems Design VSTs Accessing PHM, Maintainability, Reliability Engineers Item Managers

Design Authority
Diagnostics
Maintainability
Reliability
Modernization

Sustainment

Training

ALIS

Support Equipment

Supply Chain Management

Pratt & Whitney Relationship

Sustaining Engineering

Taxes, Tariffs, Licensing

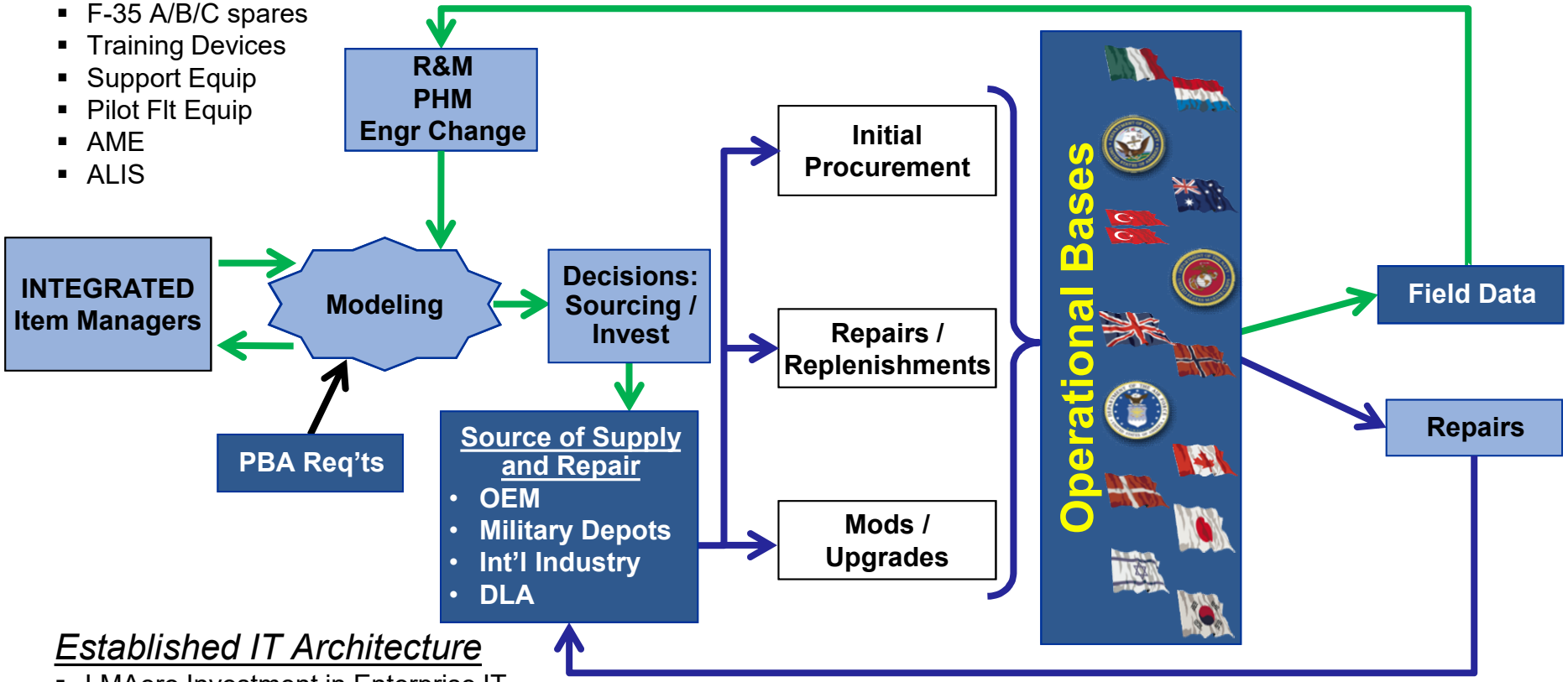
- Diagnostics
- Maintainability
- Sustainment & Modernization Thru the Life Cycle
- Reliability

As OEM, Lockheed Martin Has Ability To Optimize Fleet Support

Single F-35 Supply Chain for All Users

Supports

- F-35 A/B/C spares
- Training Devices
- Support Equip
- Pilot Flt Equip
- AME
- ALIS



Established IT Architecture

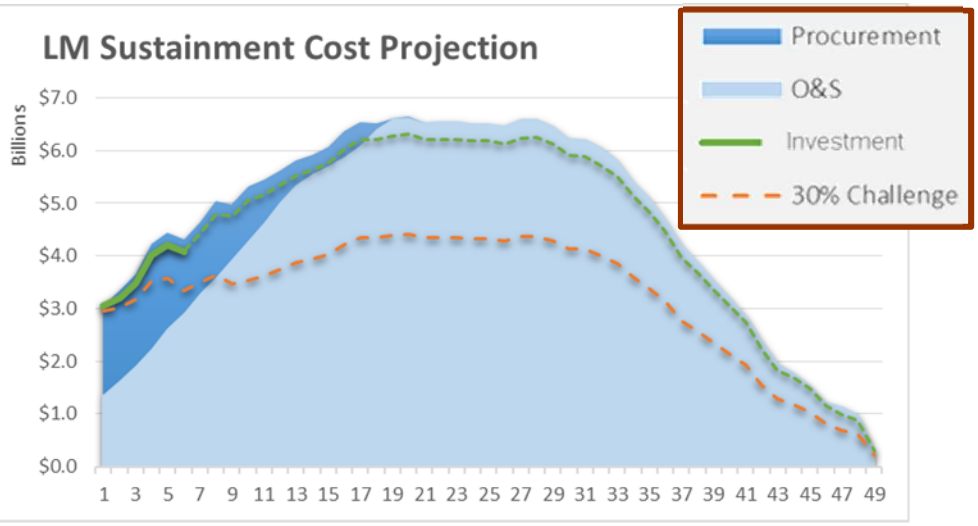
- LMAero Investment in Enterprise IT
- HPSI Enterprise Links Critical Data Between Supply Chain Elements
  - —Configuration Management
  - —Engineering Release
  - —Gov't Depots and OEM Suppliers

Data →
Hardware →

Integrated and Cost Effective Supply Chain Management

Lifecycle Cost Reduction Initiative

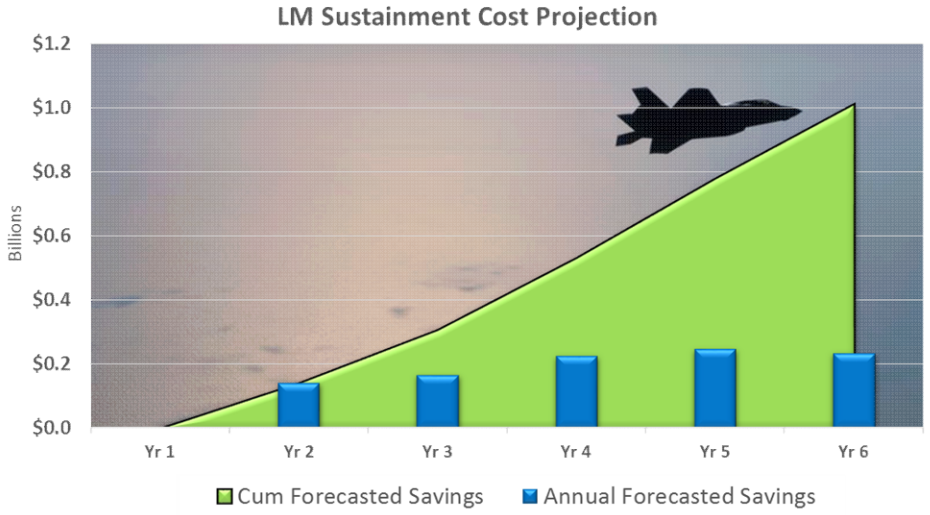
Targeted Cost Reduction Investment Program



Joint JPO/Industry Commitment to Reduce Sustainment Cost by 30%

Investment Program Aimed to Reduce $1B Sustainment Costs Over 5 Year Period

- *$250M Industry Investment Key Enabler Towards 30% Target*
- *Focus on Life-Cycle Cost Reduction, May Also Benefit Fleet Performance*
- *Additional Future Benefit Expected From Initial Investment*
- *Program modeled After the Production Blueprint for Affordability (BfA)*



Summary

- **F-35 Sustainment Is Real and Delivering Success Today**
  - *Focused on Warfighter Success*
  - *Fleet Growth – Sustainment Opportunities and Challenges*
- ***RAAF & Australian Industry Contributions***
  - *Vital to F-35 Team Success*
- **Hybrid PSI Is Right Model for F-35 Sustainment Today**
- **Focused Attention on Lifecycle Cost Reduction**

Affordable F-35 Readiness for the Warfighter