



F-35 Lightning II

John Baranowski, Director, Air Systems Logistics F-35 JPO

8 November 2006

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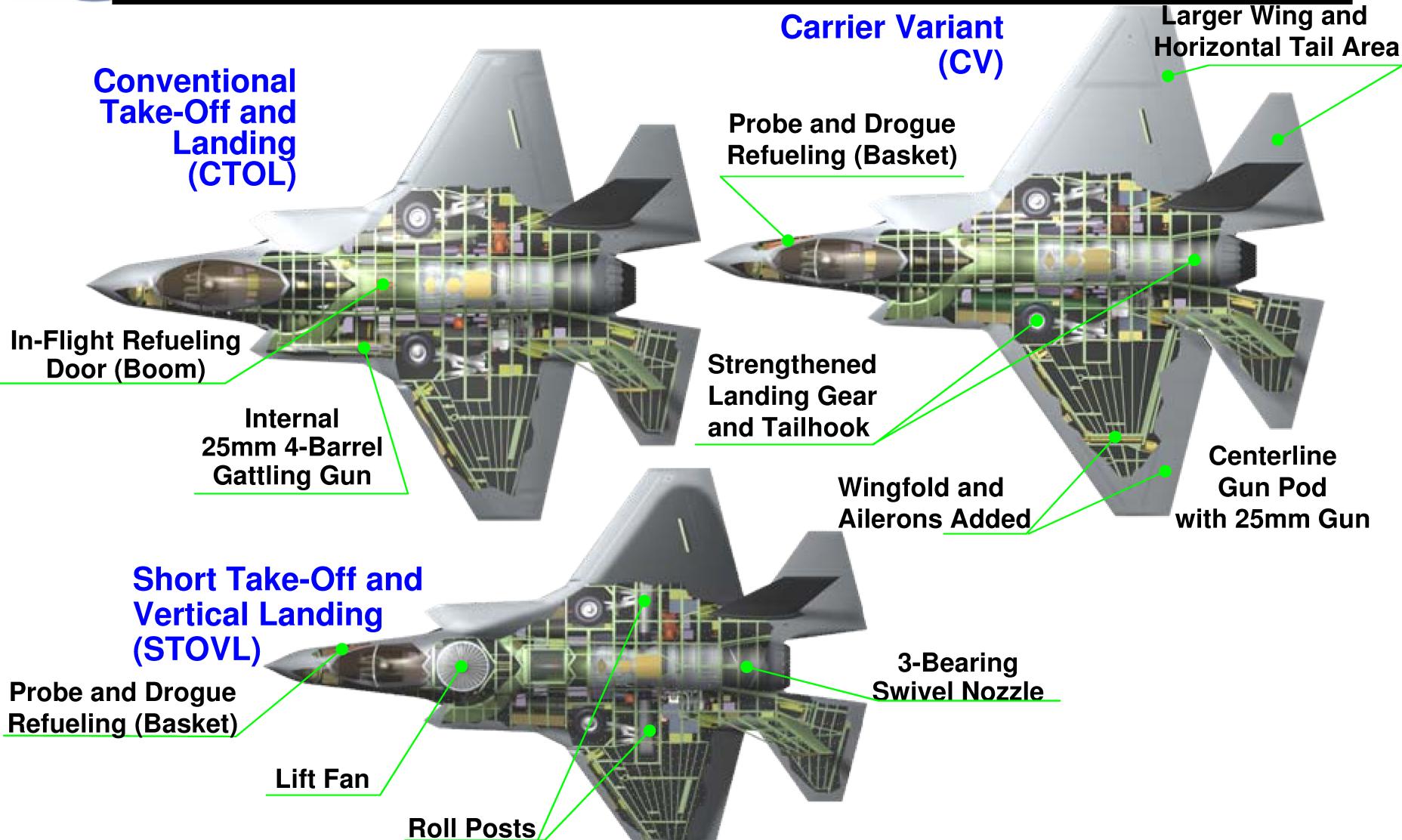
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F-35 Family Of Aircraft

One Program – Three Variants

Meeting Service and International Needs





F-35 Engine Interchangeability



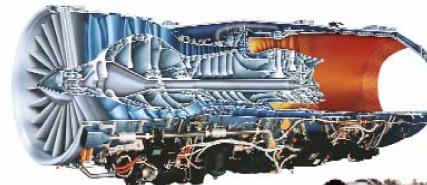
CTOL



STOVL



- Physically and Functionally Interchangeable
- Any Aircraft Able to Use Any Engine
- Common JSF Autonomic Logistics System Interfaces



PRATT & WHITNEY F135

GE ROLLS-ROYCE
Fighter Engine Team F136



F136
A STEP BEYOND

CV



GE Rolls-Royce
Fighter Engine Team

COOPETITION

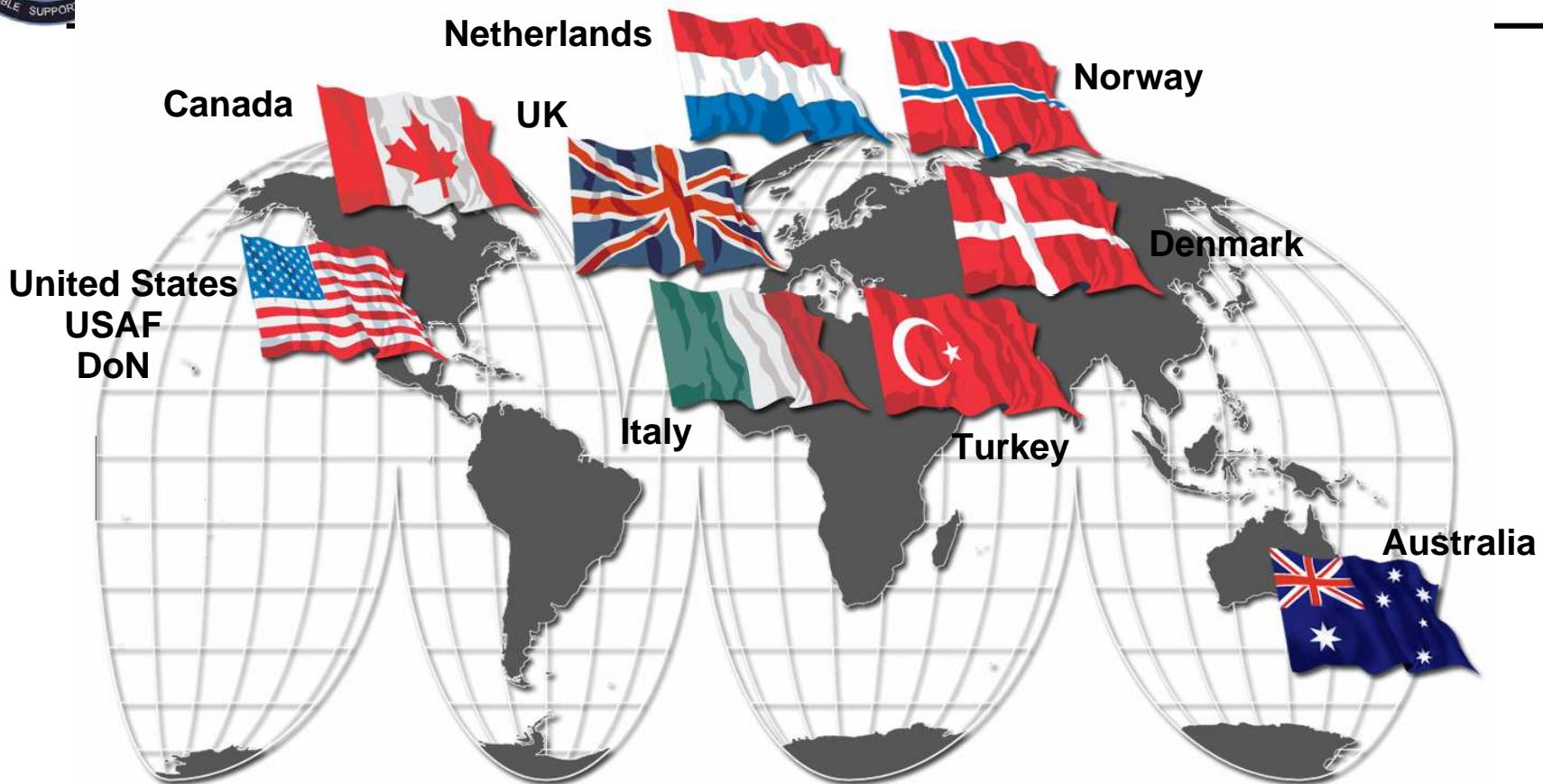
JSF Engines - - Common Core for Aircraft Variants, Competition in Production

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Service & International Needs



- **USAF:** Multi-role (primary air-to-ground) fighter to replace F-16 & A-10 & to complement F/A-22
- **USMC:** Multi-role, short takeoff, vertical landing strike fighter to replace AV-8B & F/A-18C/D
- **USN:** Multi-role strike fighter to complement the F/A-18E/F
- **UK (RN and RAF):** Supersonic replacement for Sea Harrier and GR-7

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F-35 Autonomic Logistics System

Highly Supportable Aircraft

- Smart / Reliable Design
- Prognostics and Health Management
- Remove and Replace (R/R) Maintenance
- On Condition Maintenance

Training System

- Integrated Training
- Embedded Pilot Training
- On Demand Maintenance Training
- Air Vehicle Software Reuse



Support System

- Sustaining Engineering
 - 24/7 Help Desk
- Electronic Joint-Service Tech Data
- Intelligent Maintenance Management
- Global Supply Chain Insight
- Support Equipment Management

Autonomic Logistics Information System

- Distributed Information System
- Enterprise Resource Solution
- Secure
- Scalable
- Deployable

Autonomic Logistics Provides Order Of Magnitude O&S Savings



JSF Training

Virtual – Constructive - Live

Pilot Entry Criteria

- T-38
- T-45
- Fighter Qualified

Maintainers Entry Criteria

- A School
- Tech School
- Previously Qualified Tech

Integrated Training Center

- Flying Syllabus
- Advanced Simulation Systems
- Interactive Multimedia Instruction
- Electronically Mediated Lecture



Service Training Squadrons

- 
- Service-Unique Training
 - Tactics/Weapons
 - Embedded Training

Operational and Deployed



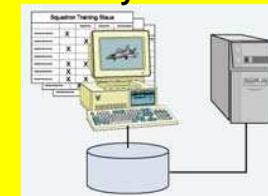
- Pilot Mission Rehearsal
- Maintainer Task Rehearsal
- Distributed Mission Training
- Web Based on Demand CBT
- Continuation Training
- Embedded Training



Deployed/On-Demand Training

- Deployable Mission Rehearsal Trainer
- Distributed Learning
- Full Access to All JSF Courseware

Training Infrastructure System



Distributed Management Records, Courseware, Software, Tech Data, Configurations

ALIS Connectivity

Feedback

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Autonomic Logistics Information System

ALIS consists of the system, application and network infrastructures required to provide global integrated and autonomic support

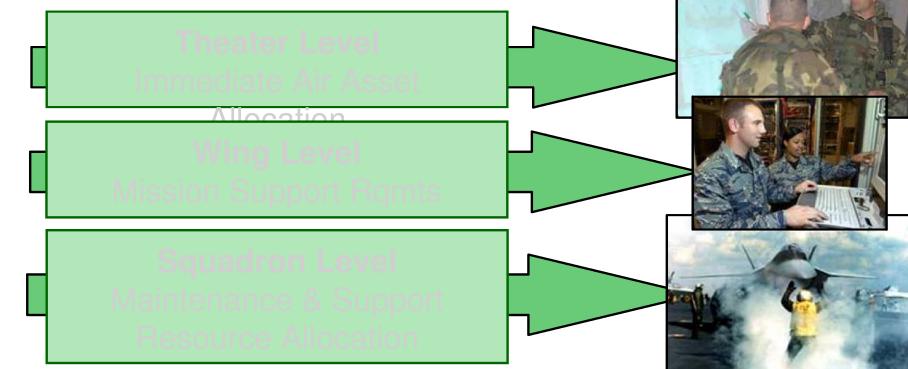
- *Single, Secure Information Environment*
- *Distributed Network Based on Web Technologies*
- *Capabilities Integrate Broad Range of Domains*

- Operations
- Maintenance
- Supply Chain
- Customer Support Services
- Training
- Tech Data
- External Interfaces



**Functionality Focused on Enhancing
Operations and Support**

- Decision Support
- Autonomic Process Integration



**“Provide All Information To Support Operations
and Maintenance at Any Basing Location”**

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Prognostics Health Management



Air Vehicle PHM

- Enhanced diagnostics / BIT
- Corroboration
- Correlation
- Information Fusion
- Health Management Reports



Downlink



PMA

Fleet Mngt Activities



Customer Support



Unit Level Maintenance

Autonomic Logistics Information System

- Decision Support
- Autonomic Process
- Integration



Off Board PHM

- Prognosis Models
- Life Usage Algorithms
- Failure Resolution Algorithms
- Diagnostic Tools



Suppliers and OEMs



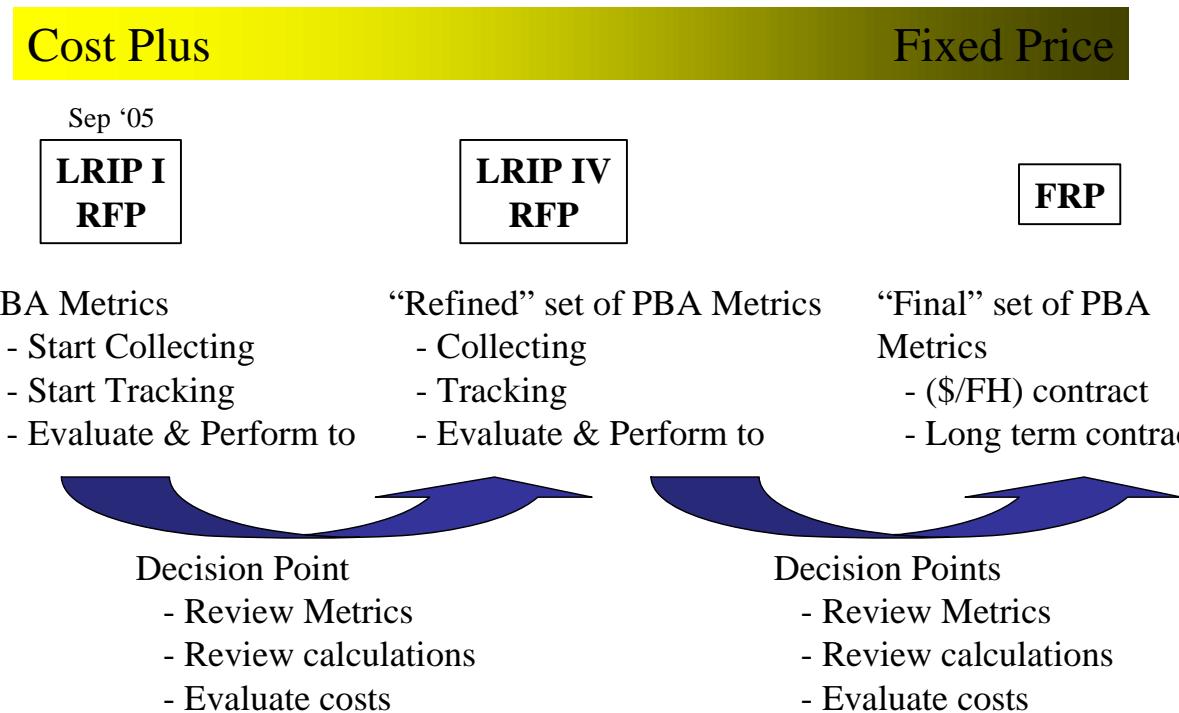
F-35 MID 917 Approach

- Part 1: Conduct Business Case Analysis (BCA) to validate that PBL is most beneficial approach for F-35
 - BCA process conducted Dec 04-Mar 05
 - Two support concepts documented for evaluation
 - Organic based Alternative Concept Description (ACD) – F-35 JPO
 - F-35 Autonomic System based ACD – Lockheed Martin
 - Integrated quantitative and qualitative analyses completed
 - **PBL validated as best sustainment process for F-35**
- Part 2: Develop a PBL Road Map phased approach for the JSF which integrates MID 917 process initiatives
 - Will be an evolving PBL concept
 - Identify obstacles and potential mitigation strategies
 - Demonstrate F-35 ability to implement initiative in the following areas
 - Overall PBL performance
 - Contracting
 - Programming & Budgeting
 - Finance



Actual Performance against PBA

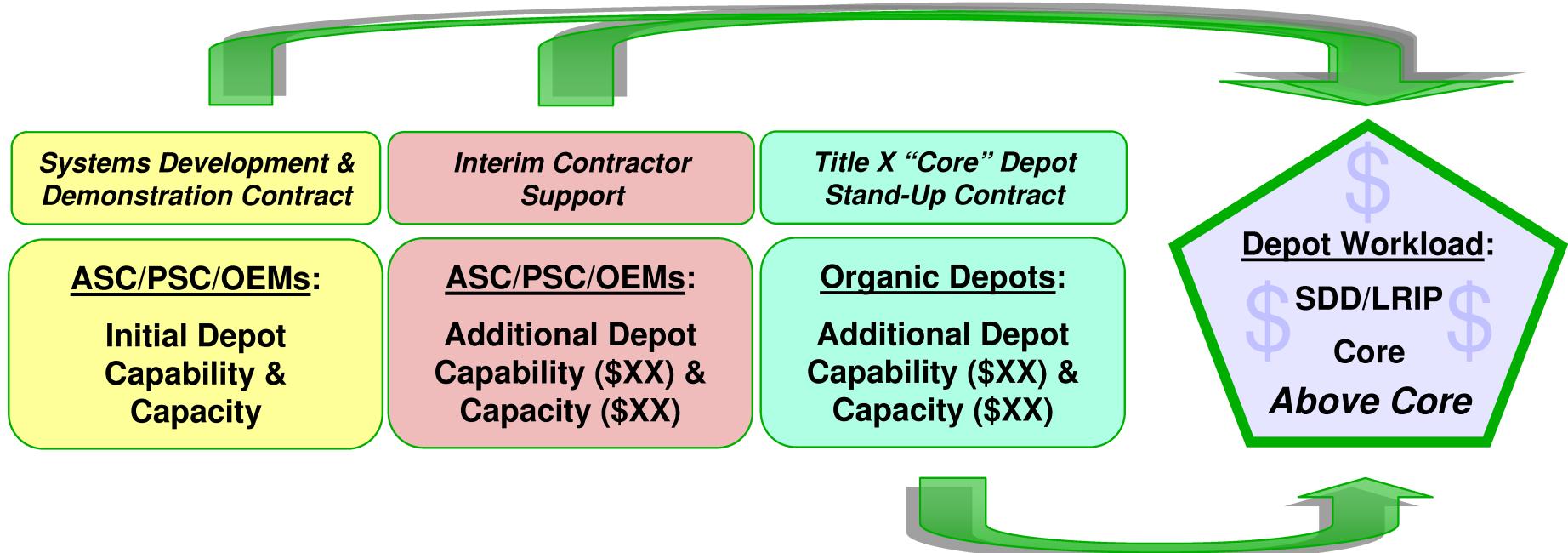
- No actual performance against PBA yet
- LRIP I contract performance begins early 2007 (Deliveries 2009)
- Full PBL expected to begin after last U.S. IOC (2013)





Interim Contractor Support (ICS)

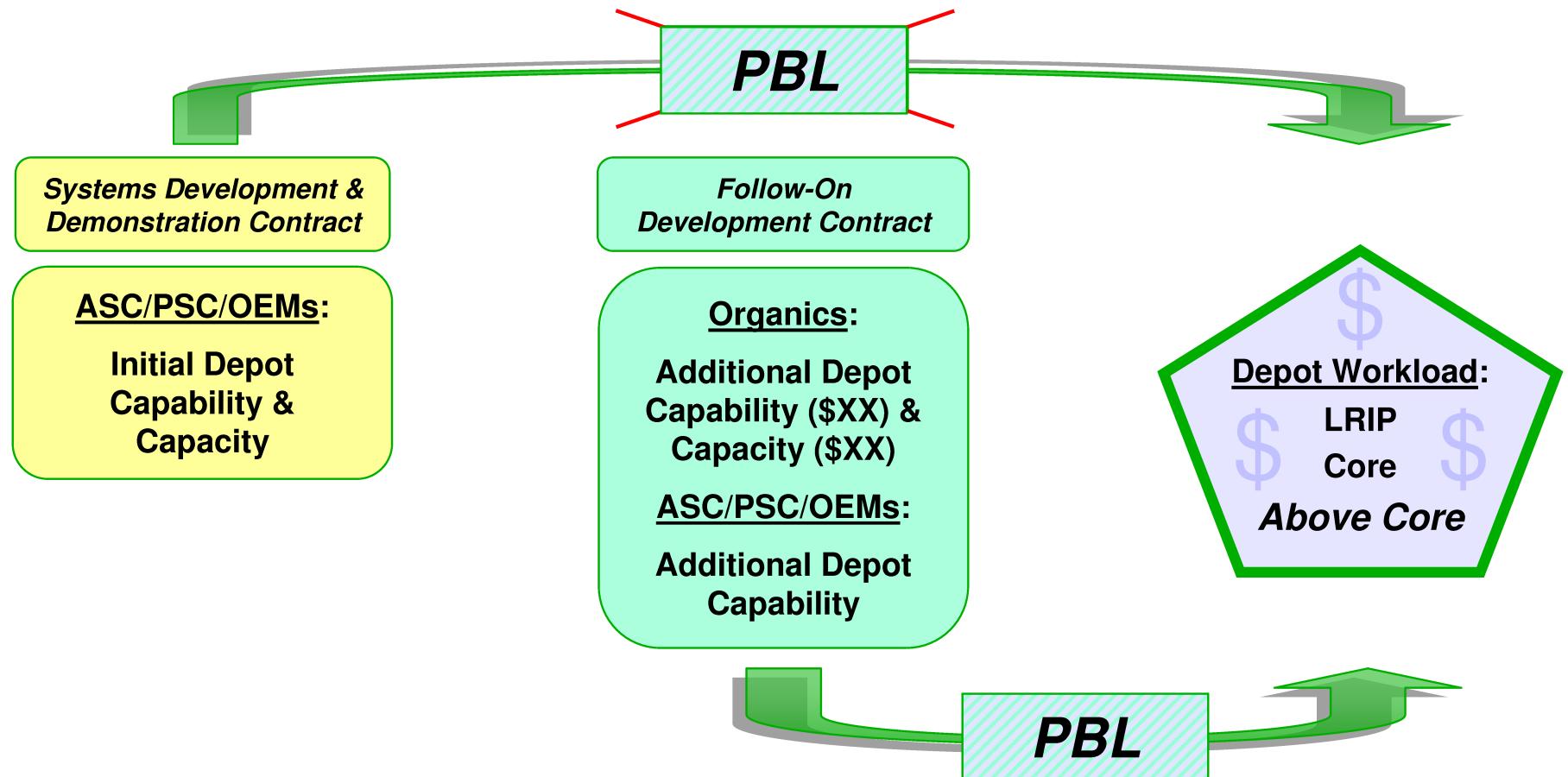
Non-Recurring Depot Costs



Legacy ICS Approach... Financially Motivates ASC/PSC/OEMs to Defer Additional Depot Capability to ICS Contract... Results in Duplicate Cost for Organic Stand-Up and Excess Capacity



JSF Approach: Leverage SDD Contract...Right Size Capacity



JSF Approach Breaks Interim Contractor Support (ICS) Paradigm... Financially Motivates ASC/PSC/OEMs to Maximize SDD Developed Capability



F-35 SDD Program Schedule

(With PB-06 US and Apr 05 UK Quantities)

The Gantt chart illustrates the timeline of the F/A-18E/F program milestones from 2003 to 2015, categorized into several functional areas:

- Air System Program Events:** Includes AS PDR, AS CDR 1, AS CDR 2, AS CDR 3, CTOL FF, STOVL FF, CV FF, IOC USMC, IOC USAF, IOC USN, IOC UK MOD, DT Complete, and OT Complete.
- Mission & Vehicle Systems:** Shows the progression through Block 0, 0A, 0B, 0C, 1, 2, and 3.
- Propulsion:** F135 and F136 timelines, including CDR, FETT, IFR, FFR, ISR, OCR, SDD, and various flight modes like CTOL/CV, STOVL, and Mx.
- Autonomic Logistics Development:** CTOL Trng Sys PDR, ALIS PDR, Pilot PDR, Mx PDR, Pilot CDR, Mx CDR, Blk 1 RFT, Blk 2 RFT, Blk 3 RFT, and the Development and Qualification phase.
- Low Rate Initial Production (LRIP) (US and UK Qtrs):** LRIP I (5), LRIP II (18), LRIP III (49), LRIP IV (60), LRIP V (73), LRIP VI (110), LRIP VII (143), MYP 1, EOQ, and MYP.
- Production:** CTOL - 5, CTOL - 8, STOVL - 10, CTOL - 15, STOVL - 20, CV - 12, UK - 2, CTOL - 20, STOVL - 20, CV - 16, UK - 3, CTOL - 31, STOVL - 23, CV - 10, UK - 8, CTOL - 65, Don - 36, UK - 3, and CTOL - 90, Don - 43, UK - 2.

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Questions?