

# Customer Keynote



## Michael (Mike) Taylor

Director, Global Supply Chain F-35 Program, Aerospace Systems,  
Military Aircraft Systems

Mike is responsible for all Global Supply Chain activities in support of the F-35 JSF Program for Northrop Grumman. This includes all supplier management, contracting- procurement and subcontracts, supplier quality, material budget performance, material planning, stores and distribution.

Mr. Taylor has over 25 years of management experience in the defense, aerospace industries focused on Global Supply Chain and Business Management. Previously Mike was VP at GE Aviation Systems responsible for Global Supply Chain across 4 operating businesses with locations in Europe and Asia.





# F-35 Lightning II



# F-35 is a Multi-Service, Global Program



F-35A



CTOL

F-35B



STOVL

F-35C



CV



# Many Programs In One – Meeting Warfighter Requirements

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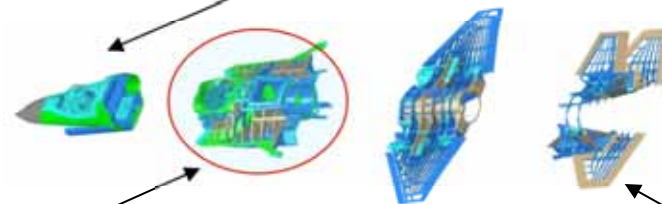
# F-35 Lightning II Team



- System Integration
- Air System Verification
- Mate Through Delivery
- Edges & Control Systems
- Autonomic Logistics



- Mission Systems
- Vehicle Systems
- Training System
- Forward Fuselage
- Wing



- Center Fuselage
- Weapons Bay Door Drives
- Arresting Gear
- CV Control and Test
- Radar
- Software
- LO Support System
- Training Courseware and Management Systems



- Aft Fuselage
- CV Wing Fold
- Fuel System
- Crew Escape
- Life Support
- EW System
- U.K. Support Center
- Throttle/Side Stick
- Horizontal/Vertical Tails
- Flight Control Computer
- STOV Control and Test
- U.K. Rqts/Stores/SW



# Northrop Grumman F-35 Team



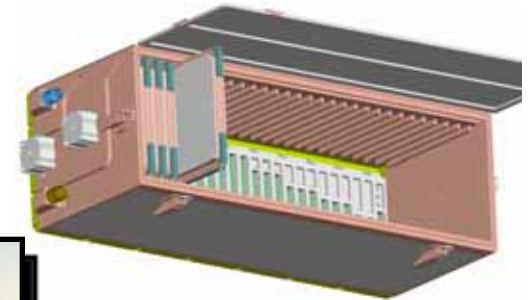
-  
Multiple NGC  
Business Sectors Contribute  
to Program



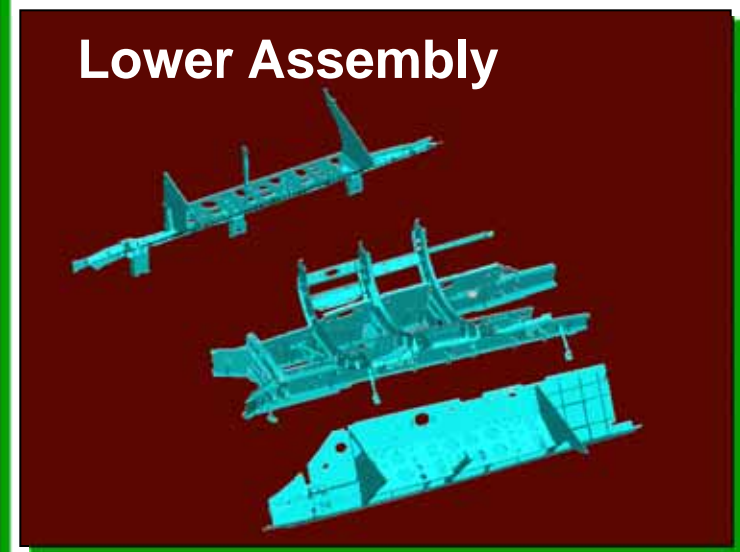
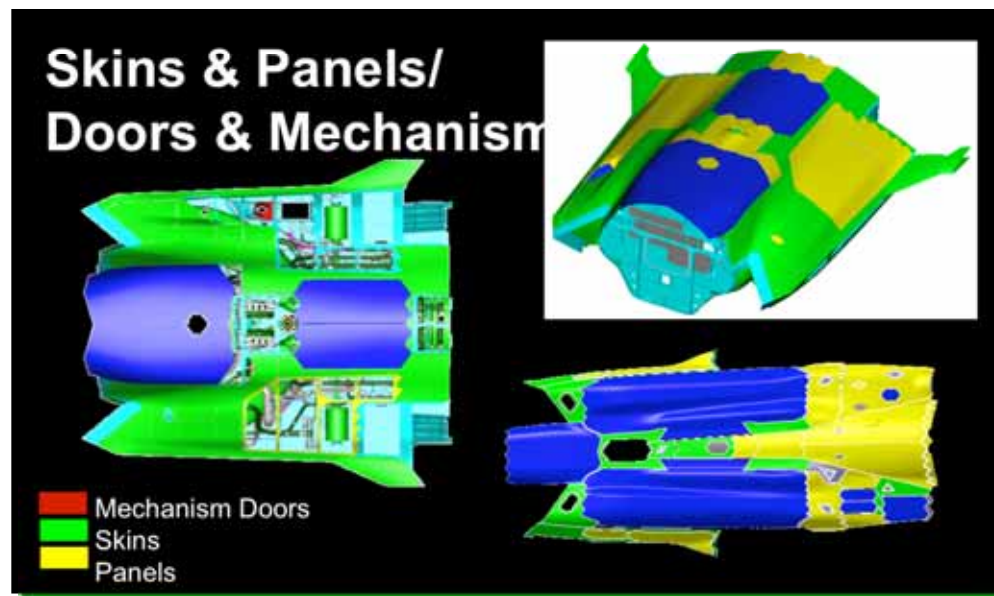
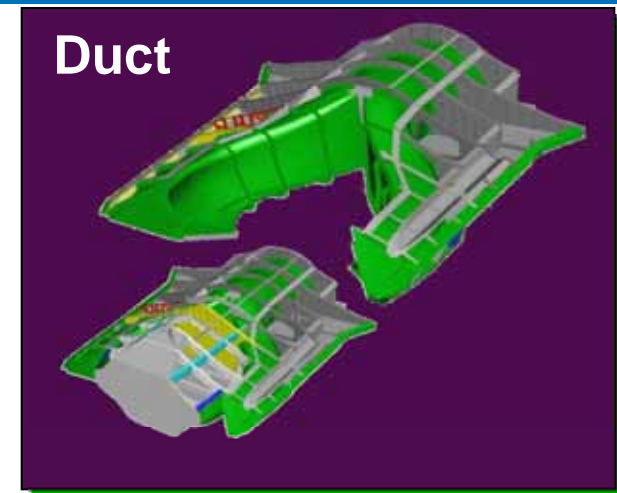
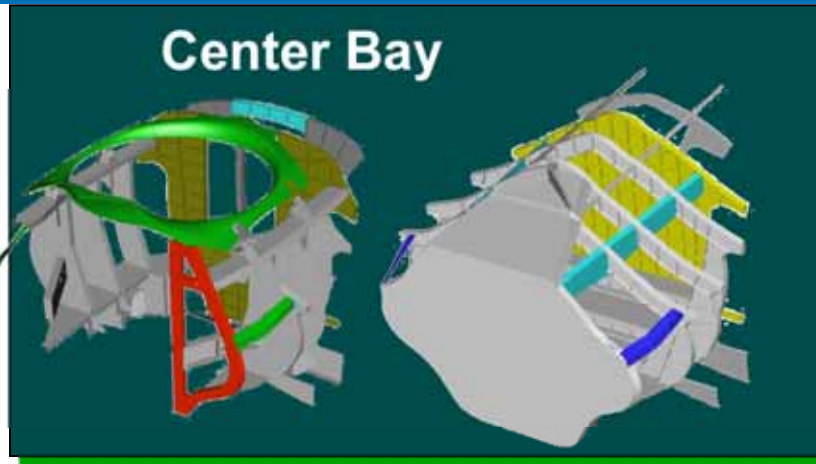
# Northrop Grumman Aerospace Systems Program Responsibilities



- Center Fuselage
- Mission Systems
  - Requirements & System Design
  - Weapons Integration
  - Avionics Components
  - Modeling & Simulation
  - Mission Software
- Vehicle Systems
  - Weapon Bay Door Drive
  - Fire Protection System
- Autonomic Logistics
  - LO Support System (Team Lead)
  - Training System Courseware (Team Lead)
- Systems Engineering
  - Survivability
  - Mission Analysis
  - Specialty Engineering
  - Improvements & Derivatives
- Flight Test Support



# Center Fuselage Team Products






# Mission Systems Products



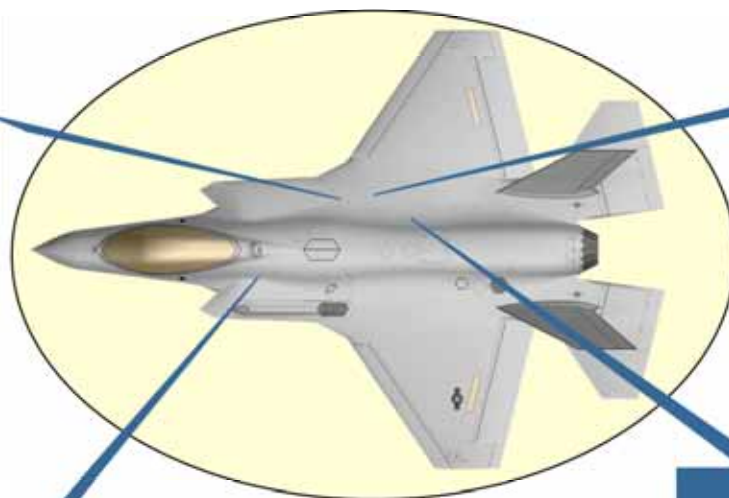
**CNI**

- INS / GPS
- GPS Electronics / Antenna
- V-Tip Antenna
- Landing Aid Antennas



**Common Components**

- Racks
- Power Supplies
- Module Components

**On-Board Software**

Legend: LM Aero (Red), NGC (Blue), BAES (Yellow)

<p><b>Own Ship Sensor</b></p> <p><b>Fire Control &amp; Stores</b></p> <p><b>Data Collection</b></p>	<p><b>XCOM</b></p> <p><b>PVI</b></p> <p><b>Mission</b></p> <p><b>PHM</b></p>
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**Weapons**

- Weapons Bay Stay Out Zones
- Support For AME, S&RE, Gun Integration



**OMS**

- Mission Planning
- JMPS Integration
- On-Board Decision Aid Integration



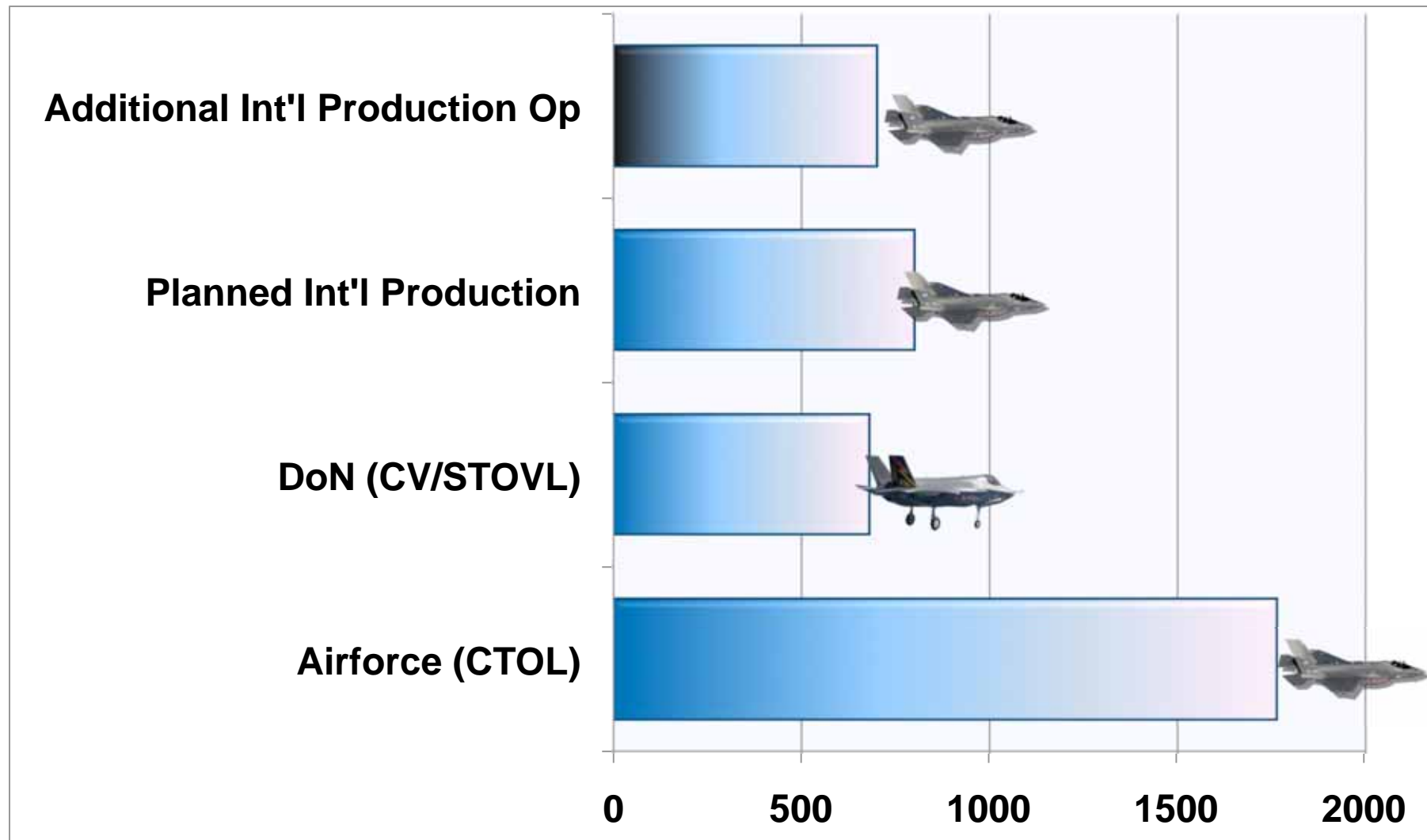
# Autonomic Logistics



- Low Observables Support System
  - F-35 Team Lead for Design & Development
- Maintenance Engineering, Support Systems Modeling & Analysis
- Mechanical Support Equipment Design & Development
- Spares Provisioning and Tech Manual Source Packages for NGC A/V Work Content
- Training System Courseware
  - F-35 Team Lead for Design & Development
  - Includes Pilot, Maintainer & Integrated Test Force Training



# Planned Production Profile



# Northrop Grumman F-35 Sub- Contracts Team



GENERAL DYNAMICS



**KUKA**

*Suppliers for Support*

- Spares, Repairs and Support of Above Hardware Training
- Tech Data
- IAL - Tooling

*Suppliers of Structural*

- Center Fuselage
- Composite Doors

*Suppliers of Systems*

- GPS
- Fire Detection / Extinguishing
- Landing Gear
- Door Drive System



**Raytheon**



**HARRIS**



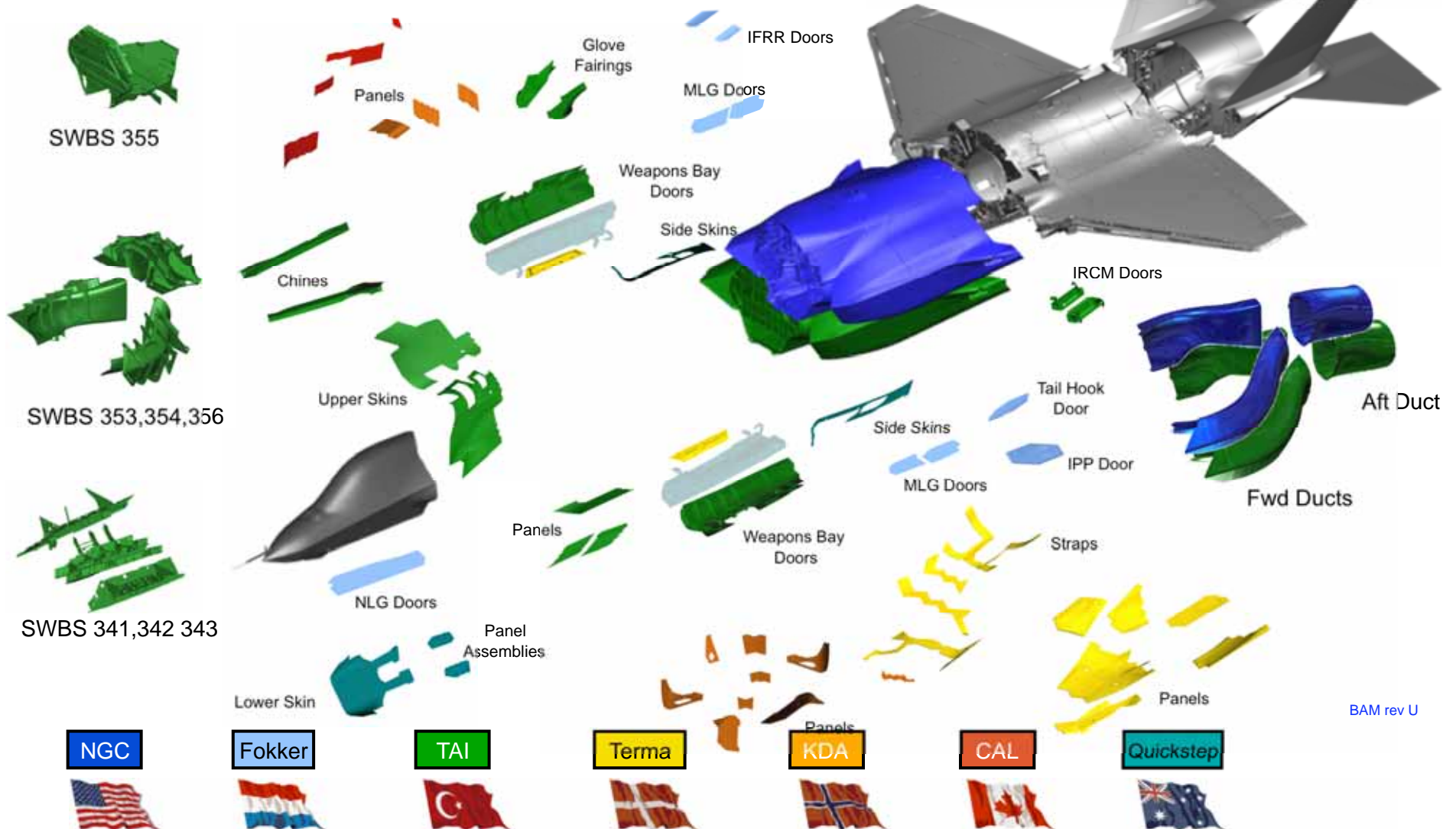
**Honeywell**





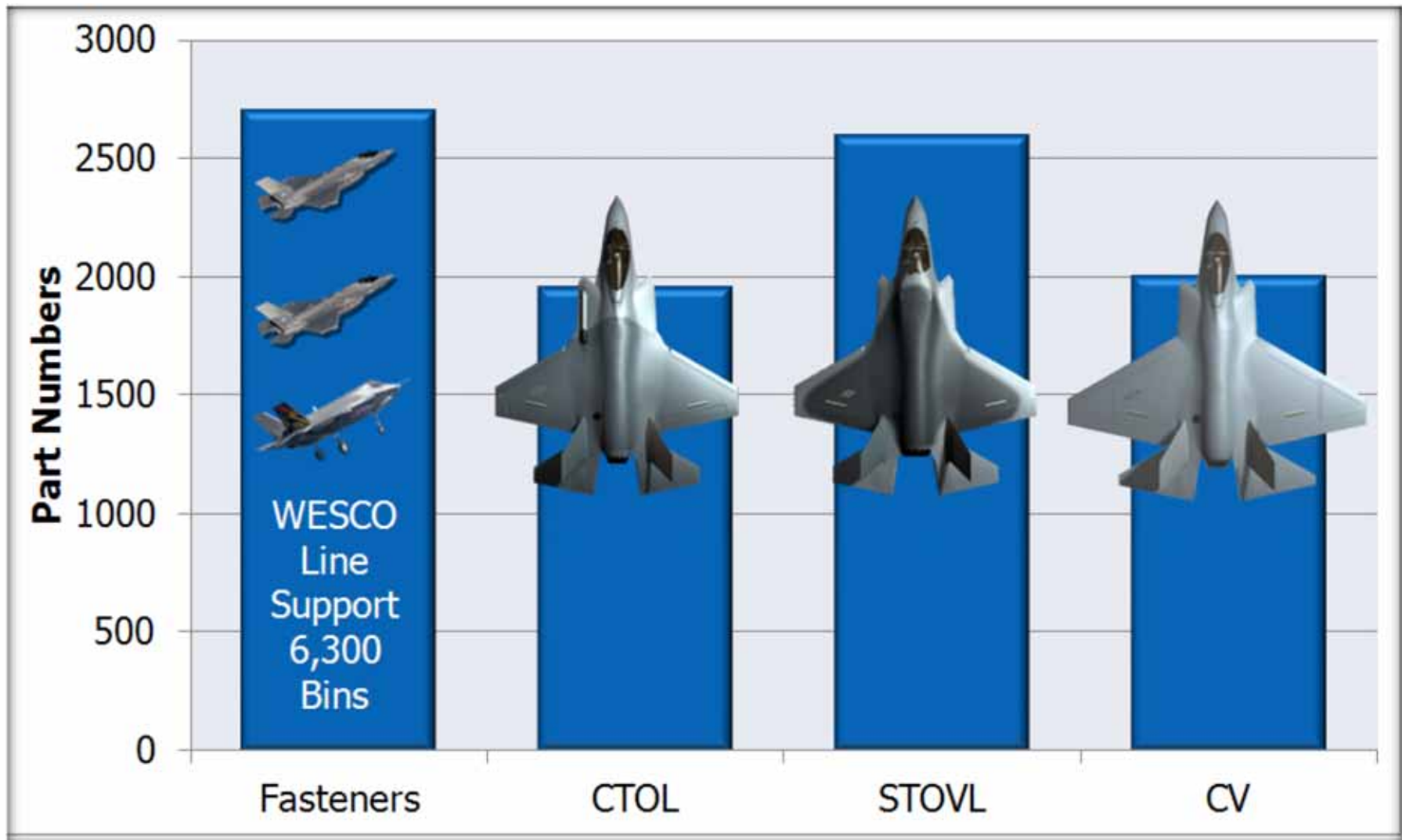
# NGAS F-35 International Industrial Participation (CTOL Center Fuselage Airframe Production)

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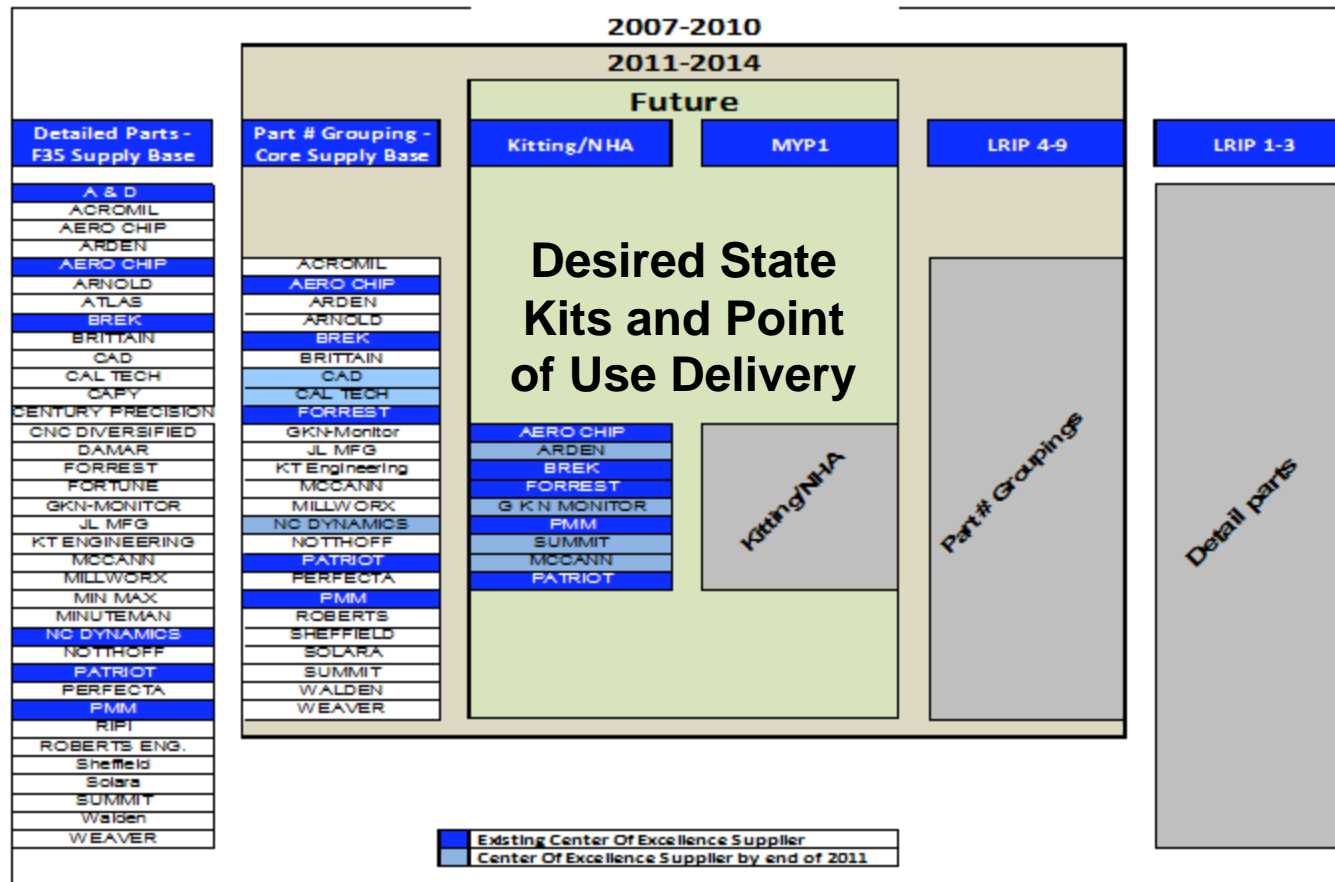


BAM rev U

# Our Procurement Suppliers Responsibility per variant

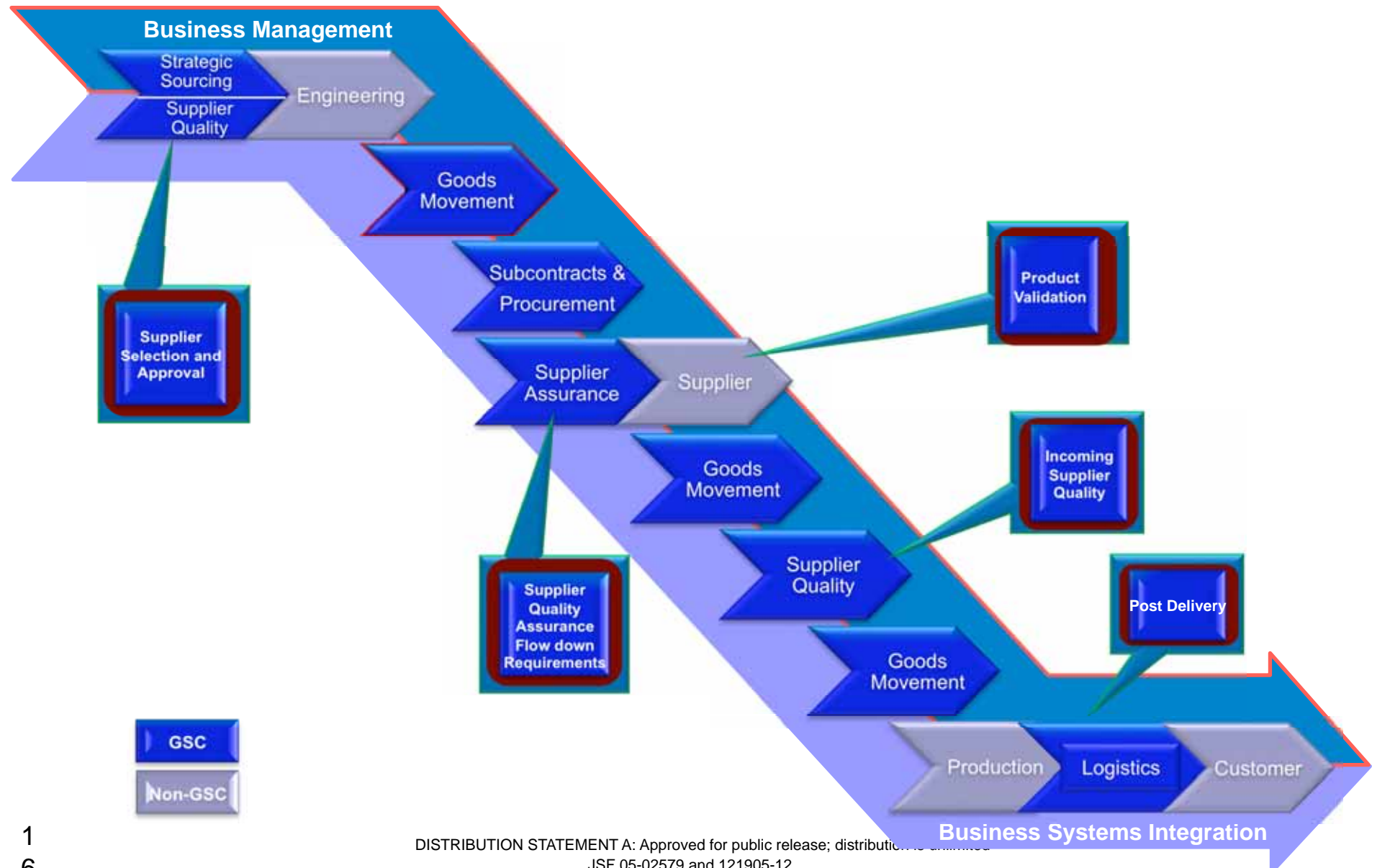


# Our Procurement Suppliers Levels of Maturity



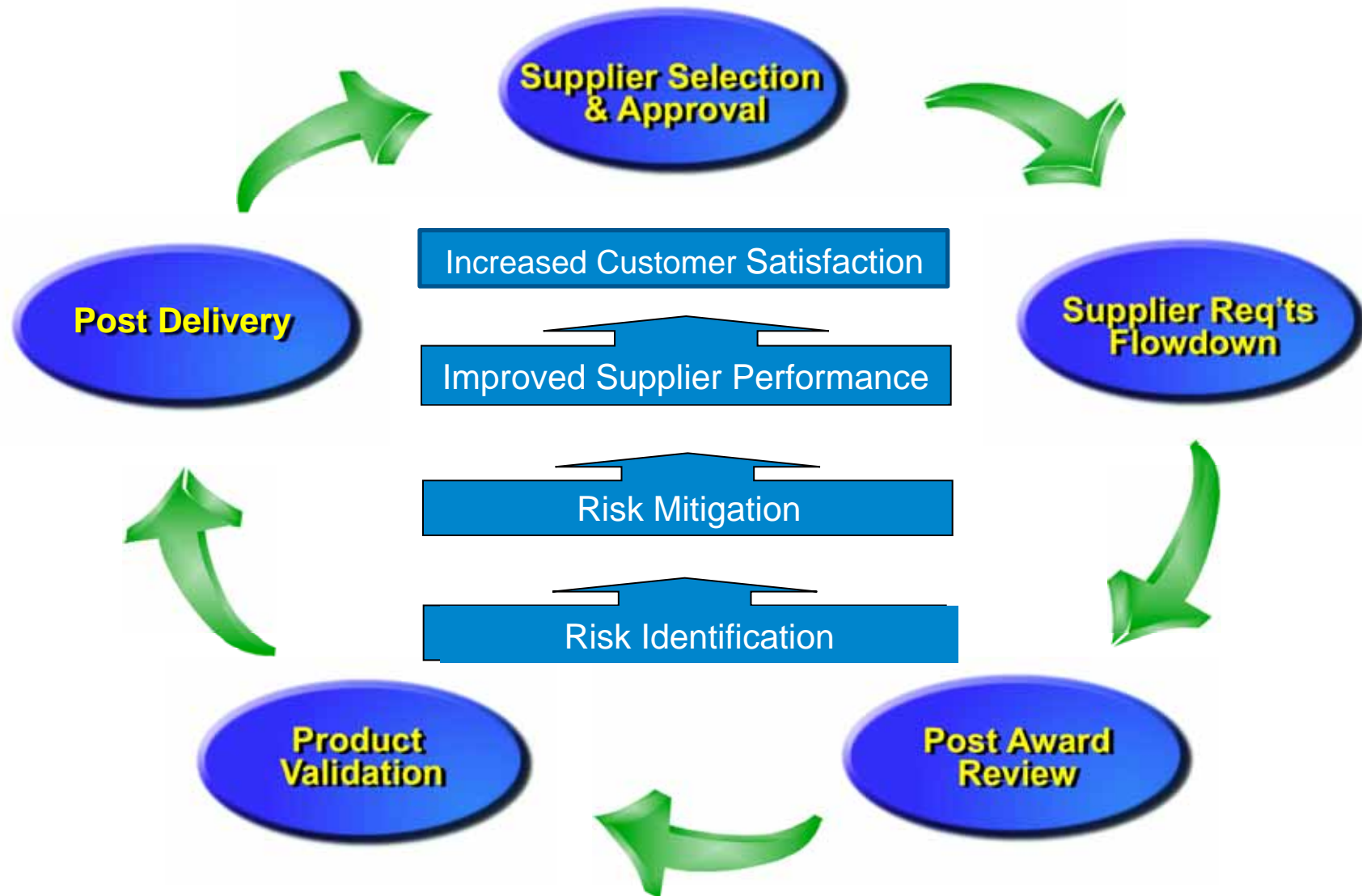
Suppliers	Unique Part Numbers
192	4940

# GSC Elements and Interaction





# Supplier Management Process

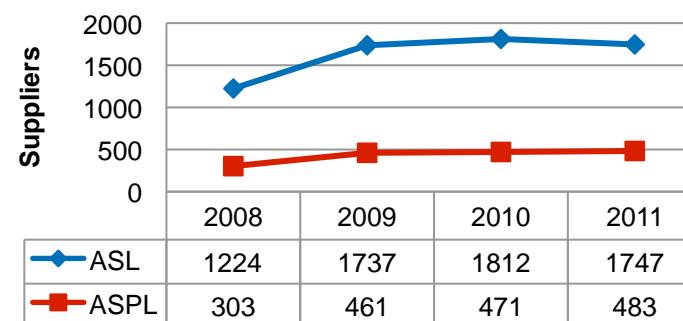


# Aerospace Sector Supply Base Overview

Approved Supplier List  
Breakdown



Approved Suppliers  
Approved Special Processors



	Open Line Items	% of Total
Preferred	3,044	6.24%
Platinum	25,444	52.18%
SSI	4,463	9.15%
<b>Delegated</b>	<b>32,951</b>	<b>67.57%</b>
Non-Delegated	15,812	32.43%
Grand Total	48,763	100.00%

Drive Purchase Orders to Our Best Suppliers

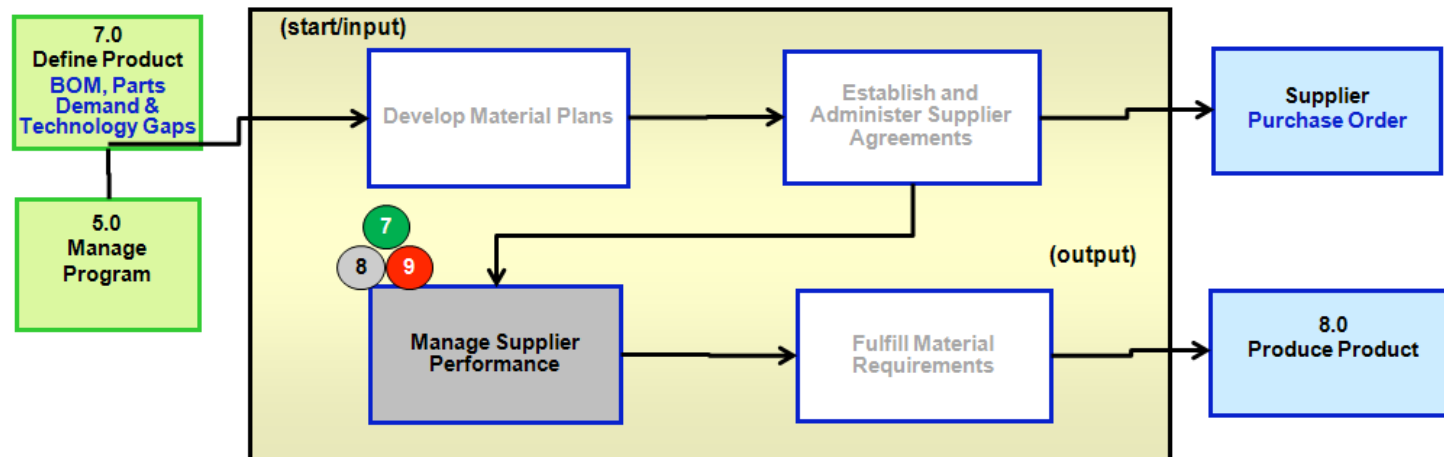
# Quality

## Key Processes

Y

### GSC Quality

#### Metrics Process Flow 4.0



Product Acceptance (Platinum, Source and/or Receiving Inspection)  
Assembly Operations (Internal Customer)

#### Key Performance Drivers

	Metric	Rating
7	Total Escapes ((Monthly)	G
8	Stock Purge( Monthly)	NR
9	SCARS( Supplier Response & VCA) (Monthly)	R

**STATUS**

<span style="display:inline-block; width:10px; height:10px; background-color:yellow; border:1px solid black;"></span>	Satisfactory
<span style="display:inline-block; width:10px; height:10px; background-color:orange; border:1px solid black;"></span>	Marginal
<span style="display:inline-block; width:10px; height:10px; background-color:red; border:1px solid black;"></span>	Unsatisfactory
<span style="display:inline-block; width:10px; height:10px; background-color:white; border:1px solid black;"></span>	Analysis Not Complete

○ Key Program Metric  
□ Other IPT Metric  
◇ Workload Indicator Metric

# Dr. Ashton Carter

## Under Secretary of Defense for Acquisition, Technology & Logistics

NORTHROP GRUMMAN



- September 14, 2010: Better Buying Power: Guidance for Obtaining Greater Efficiency and Productivity in Defense Spending
- November 3, 2010: Implementation Directive

### Target Affordability and Control Cost Growth

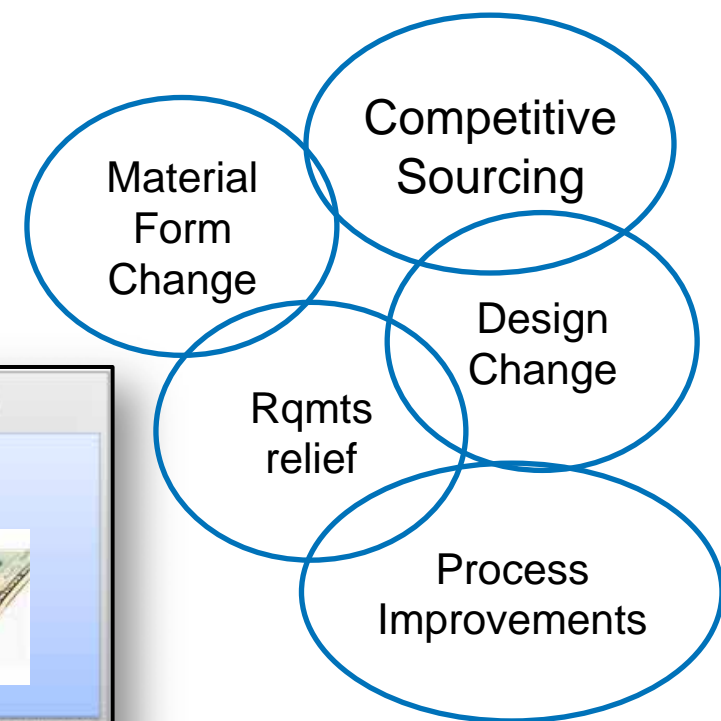
- Mandate Affordability as a Requirement
- Drive Productivity Growth Through Will Cost/Should Cost Management
- Eliminate Redundancy Within War Fighter Portfolios
- Make Production Rates Economical and Hold them Stable
- Set Shorter Program Timelines and Manage to Them





# Affordability Imperative

- Affordability - now more important than ever
- Our Company's and program's growth/survival depends on it!
- Leave no stone unturned to generate initiatives
- Engage your customers and your suppliers
- Address touch hours and above the shop floor
- Be relentless in execution



**Affordability = Survival in Today's Fiscal Environment**

# Closing Points



## In Conclusion

- Northrop Grumman is positioned well in the Defense Programs outlook
- Reduced Defense spending requires defense contractors to aggressively pursue “Affordability” at every opportunity
- Excellence in Supplier Performance- more important than ever
  - Zero tolerance for quality escapes
  - Zero tolerance for schedule slips
  - Requires increased agility
- F-35 JSF: Strong performance today = Growth tomorrow

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