

NORWAY *Industrial Participation*



25 January 2007





Agenda Topics



- **Overview**
- **Basis of Estimates**
- **LM Aero & JSF Team Projects**
 - *Current Contracted & Committed*
 - *Additional Production Related*
 - *Global Sustainment*
- **Pratt & Whitney Projects**
- **GE/RR FET Projects**
- **Summary**





Plan Overview



- **LM Aero, Northrop Grumman, Pratt & Whitney and GE/RR FET Industrial Participation Plans Support...**
 - *Norway's Continued Participation in SDD*
 - *Production, Sustainment and Follow-On Development Phase*
- **Plan is Evolving**
 - *Project Value Estimates will Evolve as Program Matures*
 - *Additional Projects will Continue to be Identified*
 - Even After PSFD MOU Signature
- **Plan Addresses Norway's Strategic Technology Imperatives**
 - *38 Projects to Date,*
 - Derived from 2,629 Aircraft Business Base
 - Over 30+ Years of High Technology Contracts

Far Surpasses a Typical 48 A/C Traditional Offset



Best Value Industrial Model



- **F-35 Industrial Model**
 - ***All Direct Work on F-35, F-135 and F-136 Engines***
 - ***Contracts Already in Place 10 Years Prior to First Norwegian F-35 Planned Delivery***
 - ***Extends Through Life of Program***
 - ***No Multipliers***
- **Tailored Opportunities to Industry Capabilities**
- **Opportunities For Exceeding Potential Procurement Value**



MoD Strategic Technology Initiatives



- **Composites Technology Insertion/Development**
 - ***Lockheed Martin Team Working with Norwegian Government and Industry***
 - Composites Technology and Manufacturing Expertise
 - Development of a Norwegian Composites Center of Excellence
- **Joint Strike Missile (JSM) Marketing**
 - ***LM Missiles and Fire Control, LM Aero and Kongsberg***
 - Joint Marketing Agreement
 - Marketing the JSM to the US Services and Other F-35 Partners
- **PLCS Software Integration**
 - ***With Autonomic Logistics Information System***
 - ***Supporting Norwegian Non-Financial Contribution***



Norway - IP Business Base



- **Norway's Best Value Industrial Opportunities Derive from 2,629 Aircraft Business Base**
 - **2581 US/UK LRIP/ Full Rate Production Aircraft**
 - **48 Norway Aircraft**
- **Full Spectrum of Potential Participation**
 - **Air Vehicle and Systems**
 - **Electronics**
 - **Sustainment**
 - **Follow-on Development**



Opportunity Development



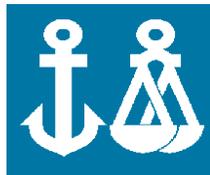
- **Production, Sustainment and Follow-On Development**
 - ***Forecasts of Opportunities through Full Rate Production Period***
 - Extended Business From SDD
 - *Reserved for Norwegian Companies deemed “Best Value”*
 - *Competitive Strategic Sourcing Opportunities*
 - *Exclusively Reserved for Norway*
 - *Norway Only Competitions*
 - *New Competitive Opportunities*
 - *Open Competitions to Which Norwegian Companies will be Invited*
 - ***New Opportunities May Develop – Add to Norway IP Plan***
 - 1st Tier Supplier Second Sourcing
 - Strategic Sourcing
 - New Competitions



Multiple Opportunities for Norwegian Defense Industry



KONGSBERG



DNV

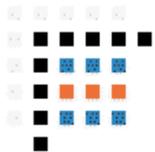
FLEXTRONICS



applica

TECHNI

Kitron



SEFAR

METRONOR

VOLVO AERO

HEXAGON

KONGSBERG
PROTECH

VMETRO
Innovation deployed

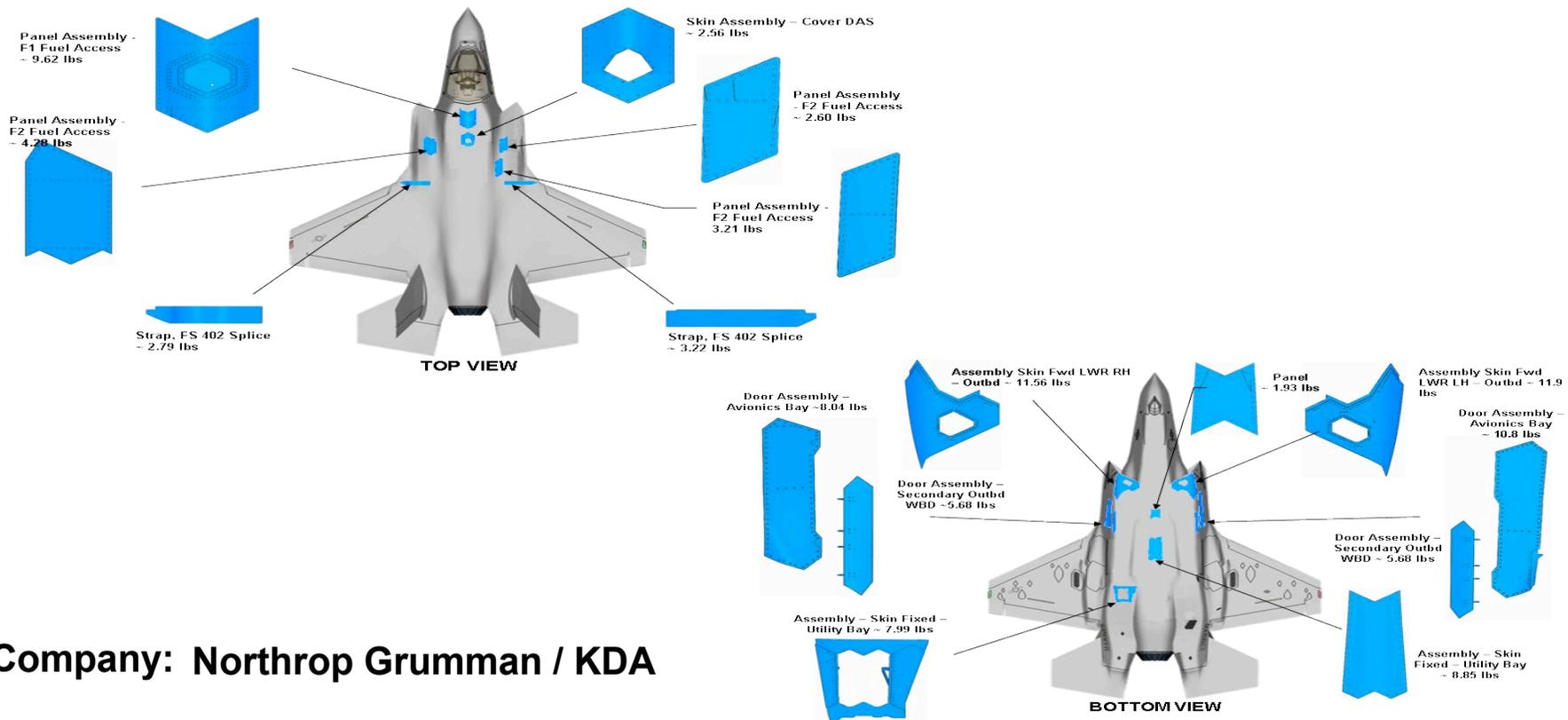




Extension Of Northrop Grumman Long Term Agreement (LTA) for Composites Production



- Extends Existing 2005 LTA Through year 2027
 - Under Same Terms & Conditions
- 14 Composites Build Packages



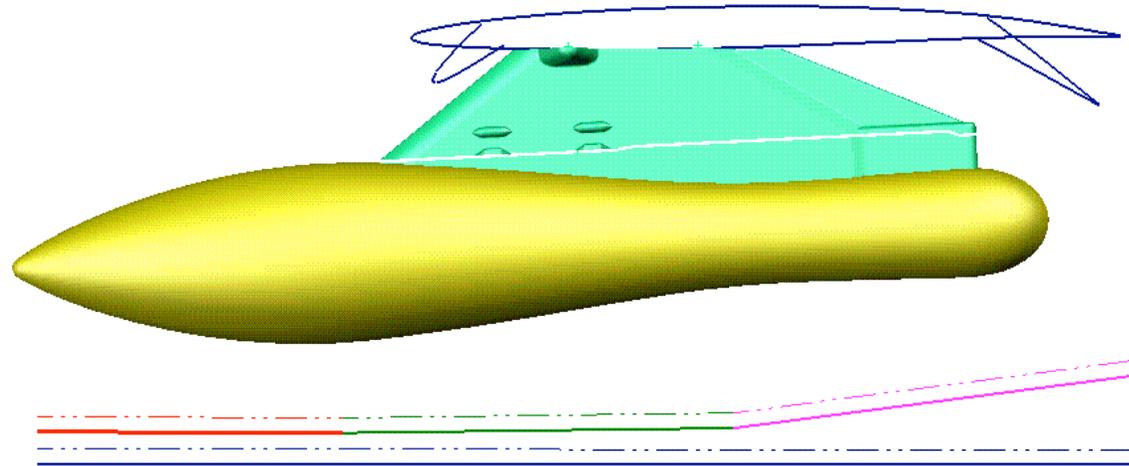
Company: Northrop Grumman / KDA



External Fuel Tanks



- Nov 2004 LOI - Hexagon Selected as a Second Tier Supplier
- Primary Source Competition Planned 1st QTR 2007
 - Will require all Tier 1 Suppliers to Utilize Hexagon as Source for Composites



Company: US-TBD / Hexagon

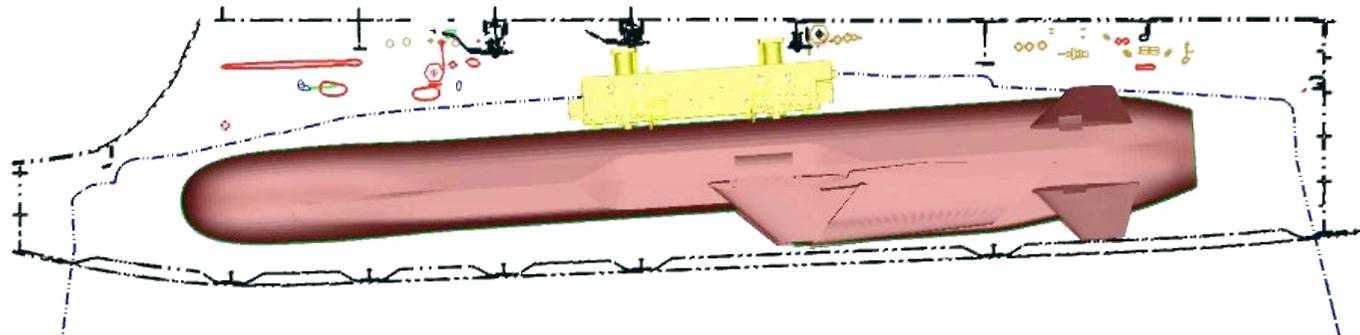


Naval Strike Missile - Phase II



- Phase 1 (Physical Integration) – Complete
- Phase 2 Contract (JPO to LM) Received
 - Mission Systems Integration
 - KDA is subcontractor for Study

NSM on Station 4 – CTOL



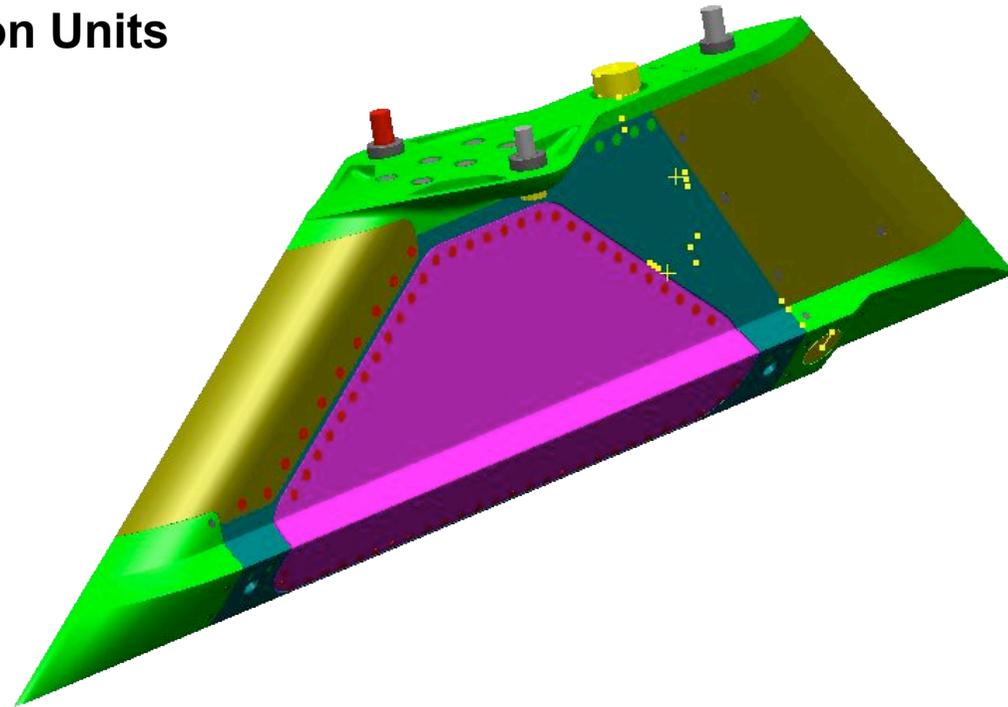
Company: LM Aero / KDA



Air to Air Pylons



- **Marvin Engineering-KDA**
 - **MOU and Letter Contract**
 - SDD Test Units
 - LRIP and Production Units
- **SDD Purchase Order**
- **2 Pylons per Aircraft**



Company: Marvin Engineering / KDA



ICP Backplane Assembly



- **Assembly of Backplane for Integrated Core Processor (ICP)**
 - SDD
 - LRIP
 - FRP Production



Company: LM MS2 / Kitron



Joint Strike Fighter International Information Interoperability Initiative (JSF4I)

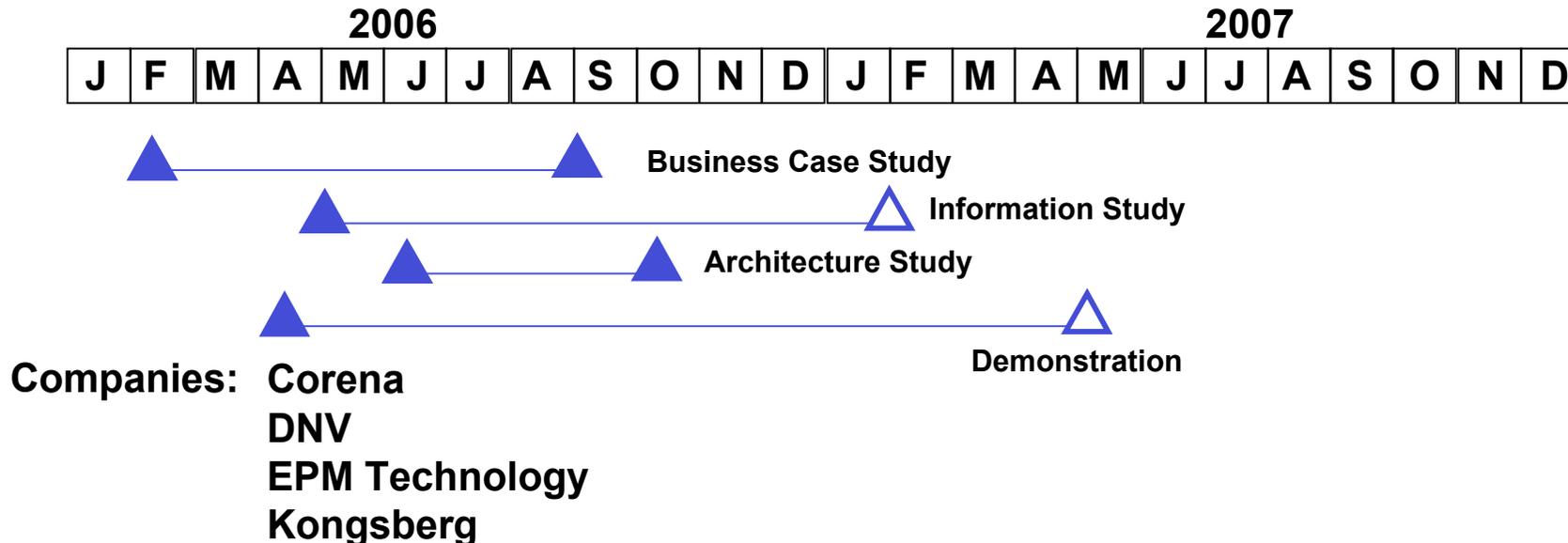


• JSF4I Objectives (PLCS)

- Trade Studies and Demonstrator
- Exchanging Product Information between JSF ALIS and Partner Nations' National Support Systems

• Deliverables

- Trade Study for Exchanging Information
- Pilot/Demonstrator of Data Exchange Approach



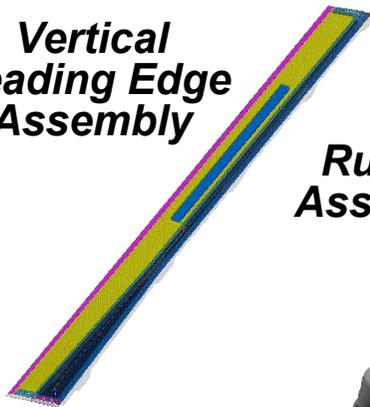


Composite Wing Skins (Upper) and Conventional Edges



- **LM Aero and KDA have signed an MOU**
 - KDA to manufacture 150 composite wing skins as a competitive strategic source
 - KDA compete on remaining production lots based on their capacity
- **KDA – LM Aero have signed an MOU**
 - KDA has won the opportunity to manufacture the Rudder and Vertical Fin Leading Edge portions of Conventional Edges

**Vertical
Leading Edge
Assembly**



**Rudder
Assembly**



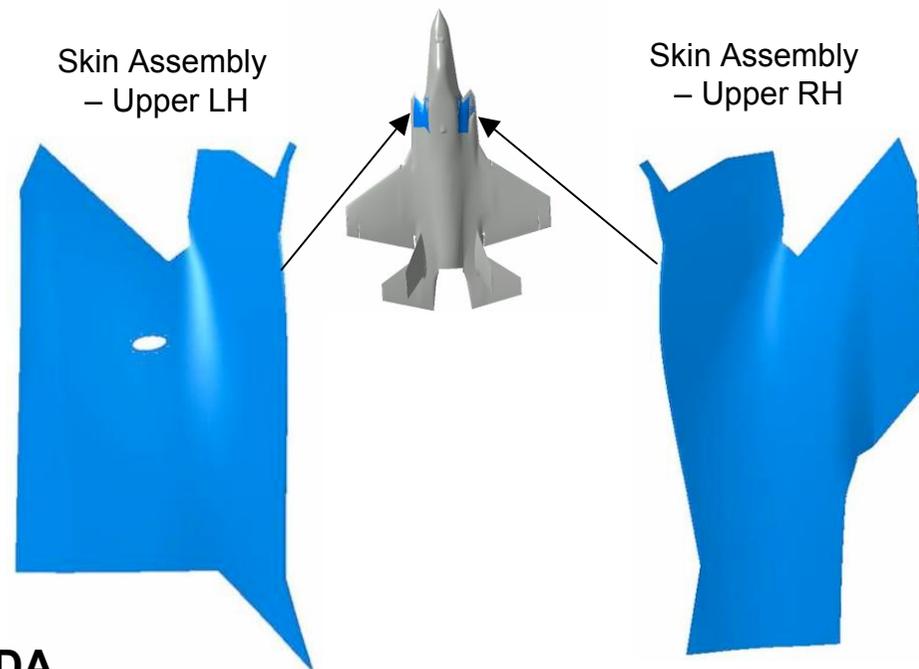


Additional Fiber Placed Upper Skins (STOVL)



- **Fiber-Placed STOVL Upper Skins Through 2036**
- **Add to Existing Northrop Grumman Long Term Agreement**

STOVL Configuration



Company: Northrop Grumman / KDA



Establish Norwegian Composites Center of Excellence



- **Funding of Technical Assistance and Composites Qualification Toward Establishment Of a Composites Center Of Excellence**
- **Supplement Government Of Norway Investment**





Pilot Flight Equipment - Production



- **Second Source for Pilot Flight Equipment**
- **Chem/Bio Protection**
- **Interfaces for Breathing Apparatus**
- **Winning Norwegian Company TBD**
 - *Support of Pilot Flight Equipment*
 - *Replenishment*
 - **Re-Manufacture**
 - **New Manufacture**





Additional Norwegian Industry Projects



Training – Courseware Development

EW Test Equipment – SDD Only

CNI – Low Band Pre-Selector Switch

ICP Fiber Channel Switch

Time Frequency Reference Module

LM Aero Machined Parts

EHAS Power Input Filter

Input Filter Housing

Casting and Machining

NGC / Applica

BAE Systems IEWS / Kitron

NG ST / Flextronics / Kitron

LM MS2 / Vmetro / Data Respons

NG ST / Kitron / Flextronics

LM Aero / Natech

Moog / Micro Circuit

Moog / Micro Circuit

NG ES / TBD



F135 Industrial Participation



Volvo Aero Norge
• F119/F135 LPT Shaft



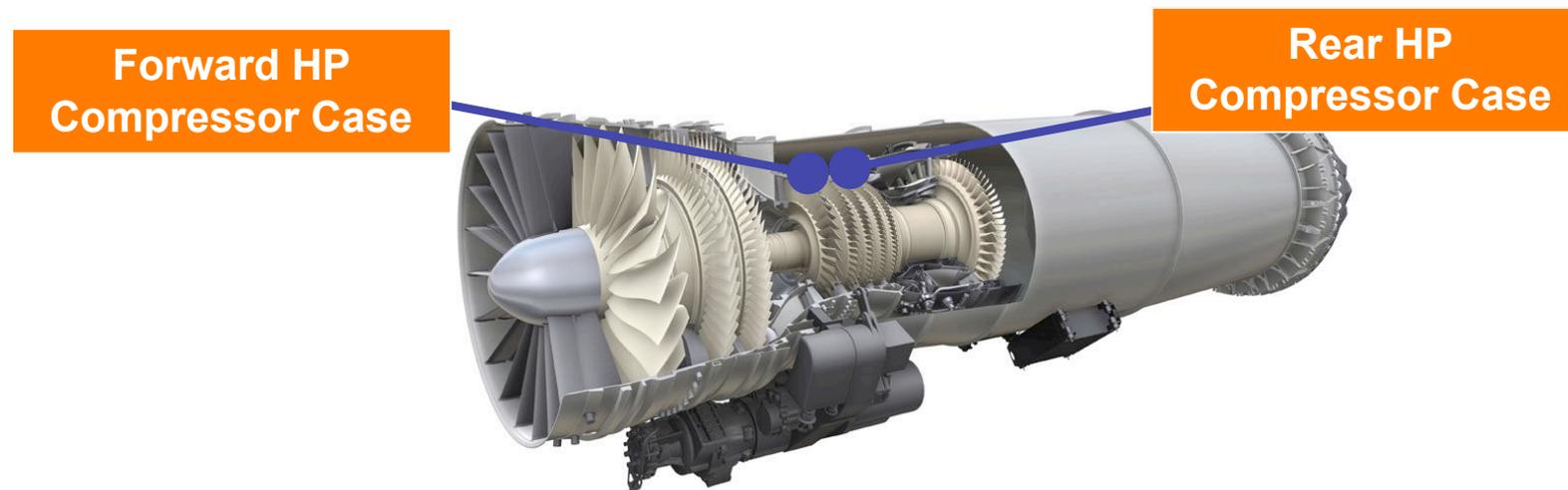
Volvo Aero Norge
• Intermediate Case



SDD Supplier Selection



- Early supplier involvement: F136 Seminars held in the UK with Norwegian Industry
- Knowledge of Norwegian industry from other programs used to identify candidates
- Confederation of Business & Industry approached to suggest further candidates
- Seminars helped FET and Industry match capabilities with work on offer
- To date, Volvo Aero Norge selected to manufacture:



- Significant opportunities remain for SDD, LRIP and Production:
 - Manufacturing
 - Engineering
 - Knowledge Programs
 - Sustainment



Norwegian Industrial Plan Summary



- **Preliminary Plan for Norway: \$4.5+ B (Then Year Dollars)**
 - **38 LM Aero JSF Team Projects**
 - **30+ Years of High Technology Contracts for Norwegian Industry**
- **Plan Still Evolving – New Projects will be Added Over Time**
- **Technology Initiatives Address Norwegian Strategic Imperatives**
 - **Composites Center of Excellence**
 - **JSM Marketing in U.S.**
 - **PLCS Software Integration**
- **Far Surpasses Typical 48 Aircraft Traditional Offset Program**
 - **Quality/Quantity of Work**
 - **Timing**