



***COBHAM***

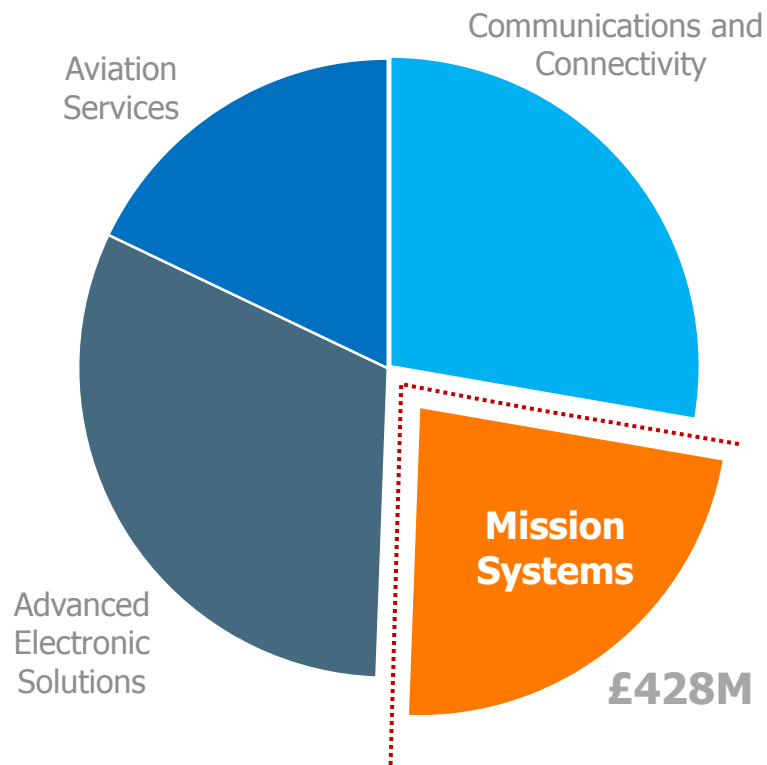
# Cobham Mission Systems

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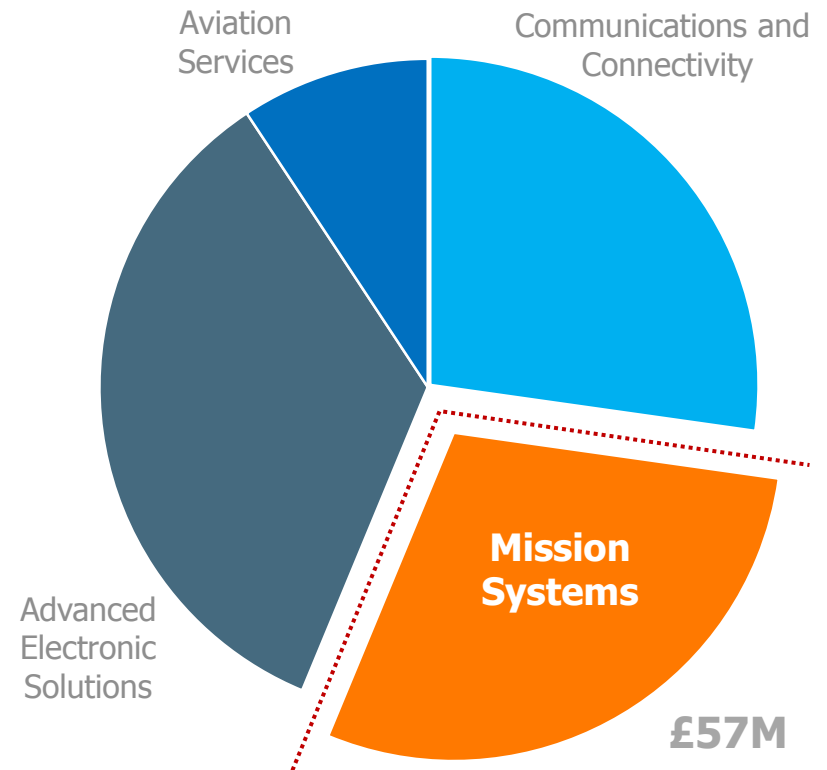
November 28, 2018

<b>EVENT</b>	<b>PRESENTER</b>	<b>TIME</b>
Welcome & Introduction	<b>David Lockwood</b> CEO, Cobham plc	10:00
Overview of Cobham Mission Systems (CMS) Sector	<b>Jim Barber</b> Sector President CMS	10:20
Aerial Refuelling	<b>Ken Kota</b> Sr. VP, Business Development & Strategy	10:50
	Q&A	11.05
	<a href="#">Coffee Break</a>	<a href="#">11:20</a>
Fuel Tank Inerting	<b>Kevin McKeown</b> VP & GM Davenport Business Unit	11:40
Oxygen Systems	<b>Ken Kota</b> Sr. VP, Business Development & Strategy	11:55
	Q&A	12:10
Concluding Remarks	<b>David Lockwood</b> CEO, Cobham plc	12:25
	<a href="#">Light Lunch</a>	<a href="#">12:35</a>

## Revenue



## Underlying Operating Profit

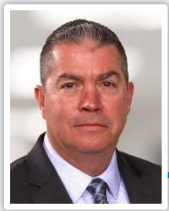


Year ended 30 June 2018 excluding divestments

## The Purpose is to Demonstrate:

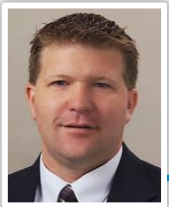
- Deep technical expertise and differentiation – we do things others can't
- Long heritage, reputation and strong market positions
- Attractive growth opportunities - addressing international markets
- Execution key to growth and enhancing operating margin

# Today's Speakers



**Mr. Jim Barber**  
Sector President CMS

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**Mr. Ken Kota**  
Sr. VP Business Development & Strategy CMS

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**Mr. Kevin McKeown**  
VP & GM Davenport Business Unit

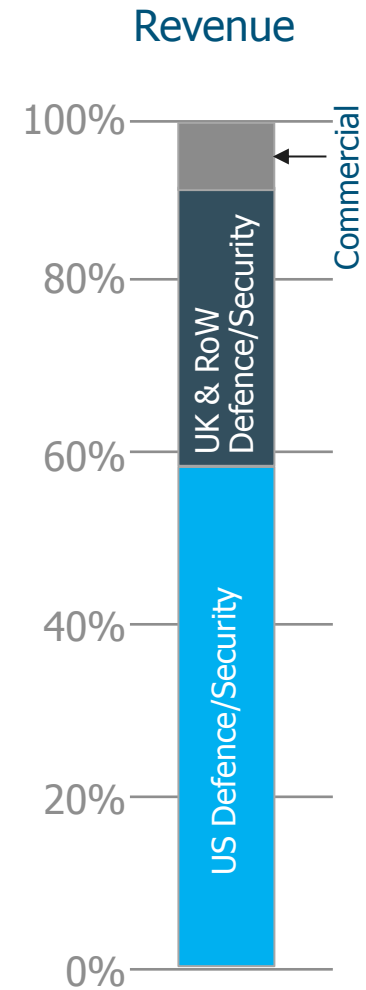
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To be the leading provider of innovative critical control solutions for extreme environments

# Growth from Leading Edge Technology and World Class Capabilities

Capability			
	Air to Air Refueling	Actuation Systems	Pneumatic Systems
Product Areas	Hose & Drogue	Emergency Actuation	Fuel Tank Inerting
	Probes	Missile Actuation	Oxygen Systems
	Fuel Tanks	Weapons Carriage & Release	Pressure Technology Solutions
			Space Propulsion
% Revenue	~40%	~30%	~30%
Medium Term Growth % p.a.	Low single digit	Flat	High single to low double digit

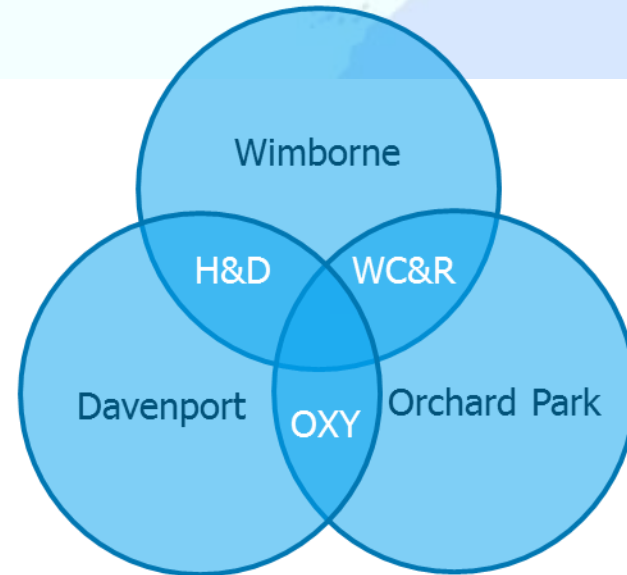


Year Ended 30 June 2018

# Increasing Collaboration Between Business Units



## Product Areas Shared Across Locations



- ✓ 3 Business Units with 6 Sites
- ✓ 2,000+ Employees

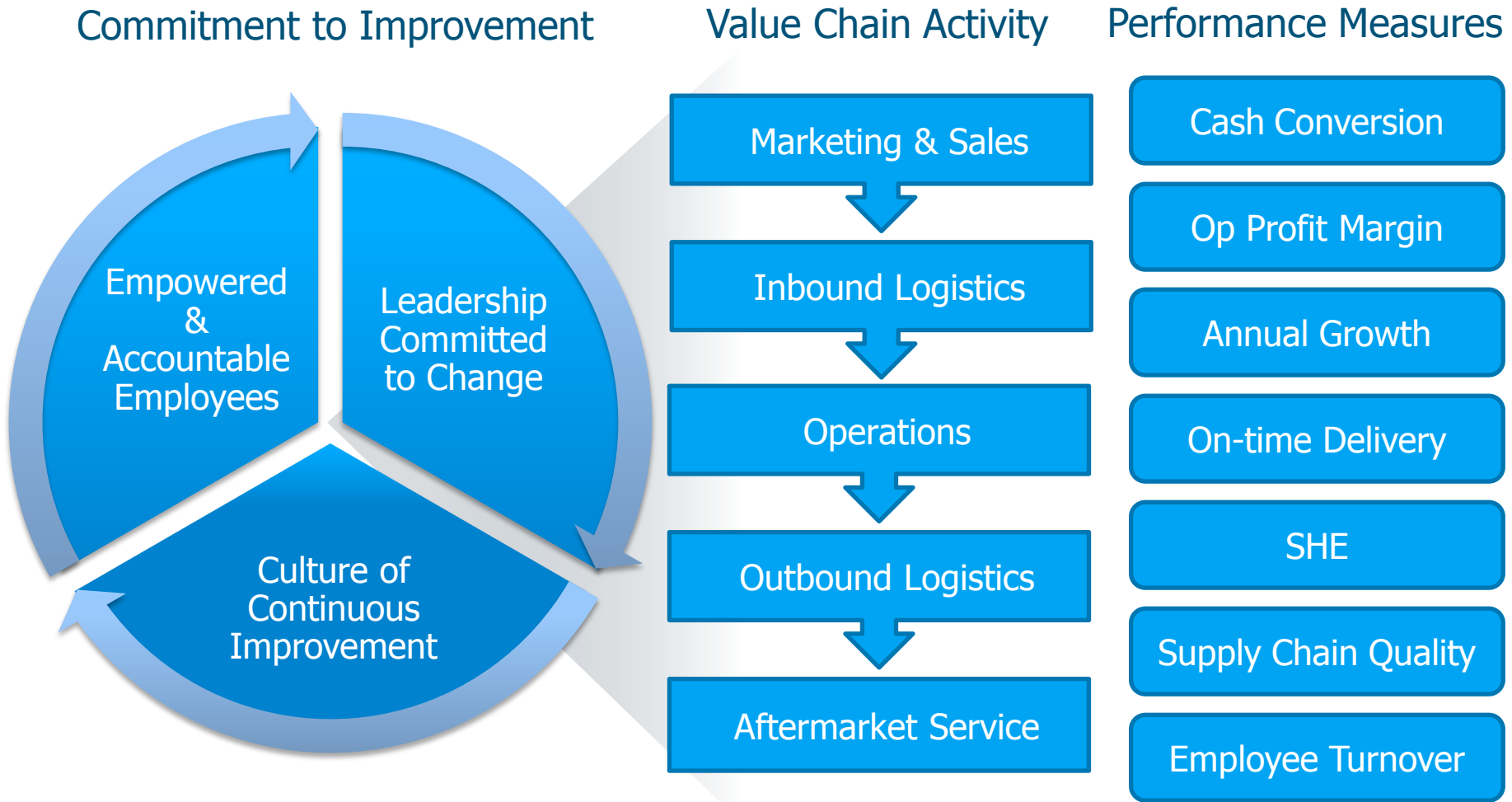


# Strong Market Conditions Aligned to CMS Capabilities



*\*Boeing Commercial Market Outlook 2018-2037*

# Driving to Consistent and Predictable Business Performance



Committed to continuous improvement for customer satisfaction

# Transformation is Addressing the Whole Value Chain

## Committed Leadership

- Enhanced leadership teams - skill assessment and gap training
- Aligning organization around customer-focused Integrated Programme Teams (IPTs) driving accountability and empowerment

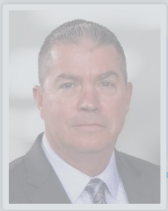
## Continuous Improvement

- Process improvement throughout order to cash receipt cycle improve On-time to Promise (OTTP)
- Supplier quality and efficiency enhancement - improving technical and contractual flow-down and product requirements documentation
- Rigorous risk management through all phases of the program life cycle

## Empowered & Accountable Employees

- Black Belt/Green Belt training and embedding of resources within the business
- Focused on root cause and corrective actions to eliminate systemic issues
- Improved critical thinking and capability via training – design for manufacturability, design for cost, design for six sigma

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Sector President CMS



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VP & GM Davenport Business Unit



# 01

## Hose & Drogue Refueling



### Operational Tempo Increase

Overseas Contingency Operations are driving greater platform utilization, increasing operating and maintenance support needs



1930  
First public demonstration of Cobham Looped Hose refueling

1950  
USAF undertakes first non-stop flight around the world with Cobham AAR

1980  
RAF undertakes world's longest bombing run using Cobham AAR

2010  
First A400M into service with German Air Force with Cobham AAR

# Pedigree and Superior Technology Give Competitive Edge

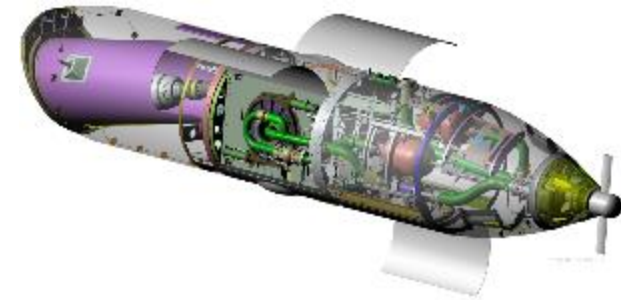
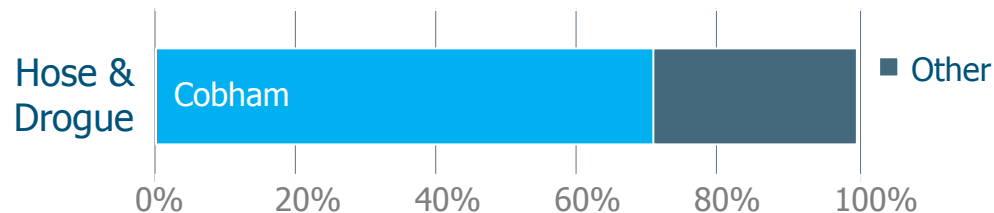
## Competitive Position

- Market leader in Hose & Drogue aerial refueling\*
- Hose & Drogue on KC-46, A400M, A330, C-130, KC-390 and V-22
- Expected £1.5B\* market over the next 5 years
- Sole source on every western aircraft with AAR capability currently in production

## Differentiators

- Closed loop control for hose and drogue refueling system
- Very high end simulation and modeling capability
- Focused AAR optimization and new coupling and stabilizing technologies

## Market Share\*



\*Global Aerial Refueling Systems - Competitive Analysis Stratview Research Oct 20, 2017 and Forecast International

# Significant Opportunity for Aftermarket Growth



## CHALLENGE

Record build rates for AAR capable aircraft.

## OPPORTUNITY

Installed base of greater than 1,200 pods by 2021. Service model will be developed to capture the aftermarket opportunity.

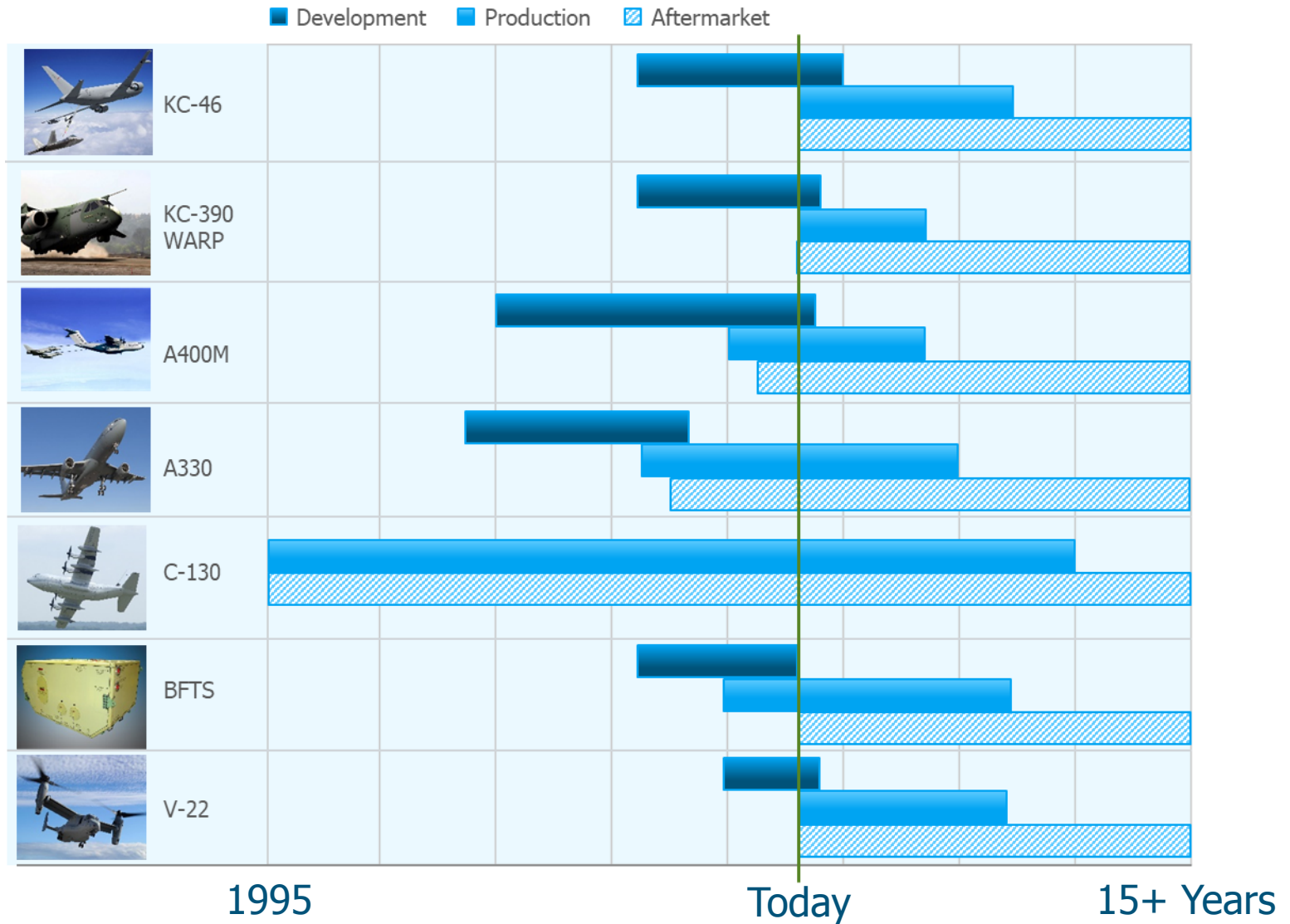
## SOLUTION

Develop and optimize aftermarket organization and structure while innovating product upgrade solutions.

## RESULT

Tightly integrated customer focused organization to meet ever-changing customer needs.

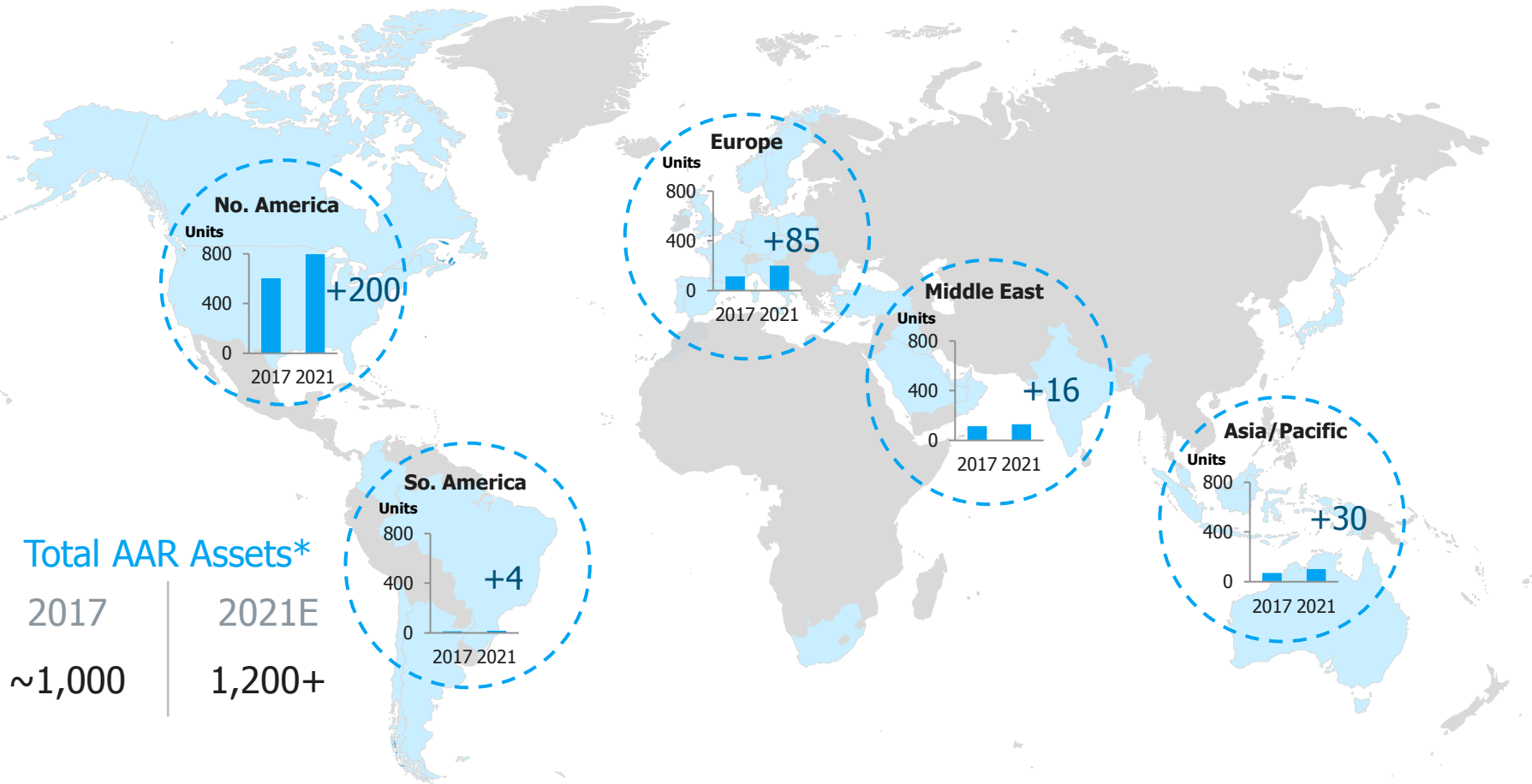
# Development Phase Ending, Long Life Assets





# Focus on Growing Aftermarket Business

■ Countries with Cobham AAR Systems or Planned to Procure AAR Systems

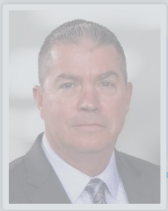


\*Global Aerial Refueling Systems. Competitive Analysis Stratview Research Oct 20, 2017, Forecast International, Company Info

- Fielded systems will have a 40+ year lifetime of operation
- AAR world-wide fleet recapitalization has started to mature into the production phase increasing manufacturing volumes
- Installed base is growing through the mid-2020s
- Changing mission needs of our customers provide aftermarket opportunities for upgrades incorporating new innovations
- Developing a tightly integrated customer-focused organization to grow our long-term aftermarket business

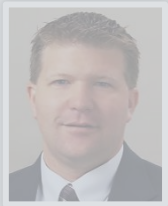
**Questions?**

# Today's Speakers



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Sector President CMS

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Mr. Kevin McKeown  
VP & GM Davenport Business Unit

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# 02

## Fuel Tank Inerting



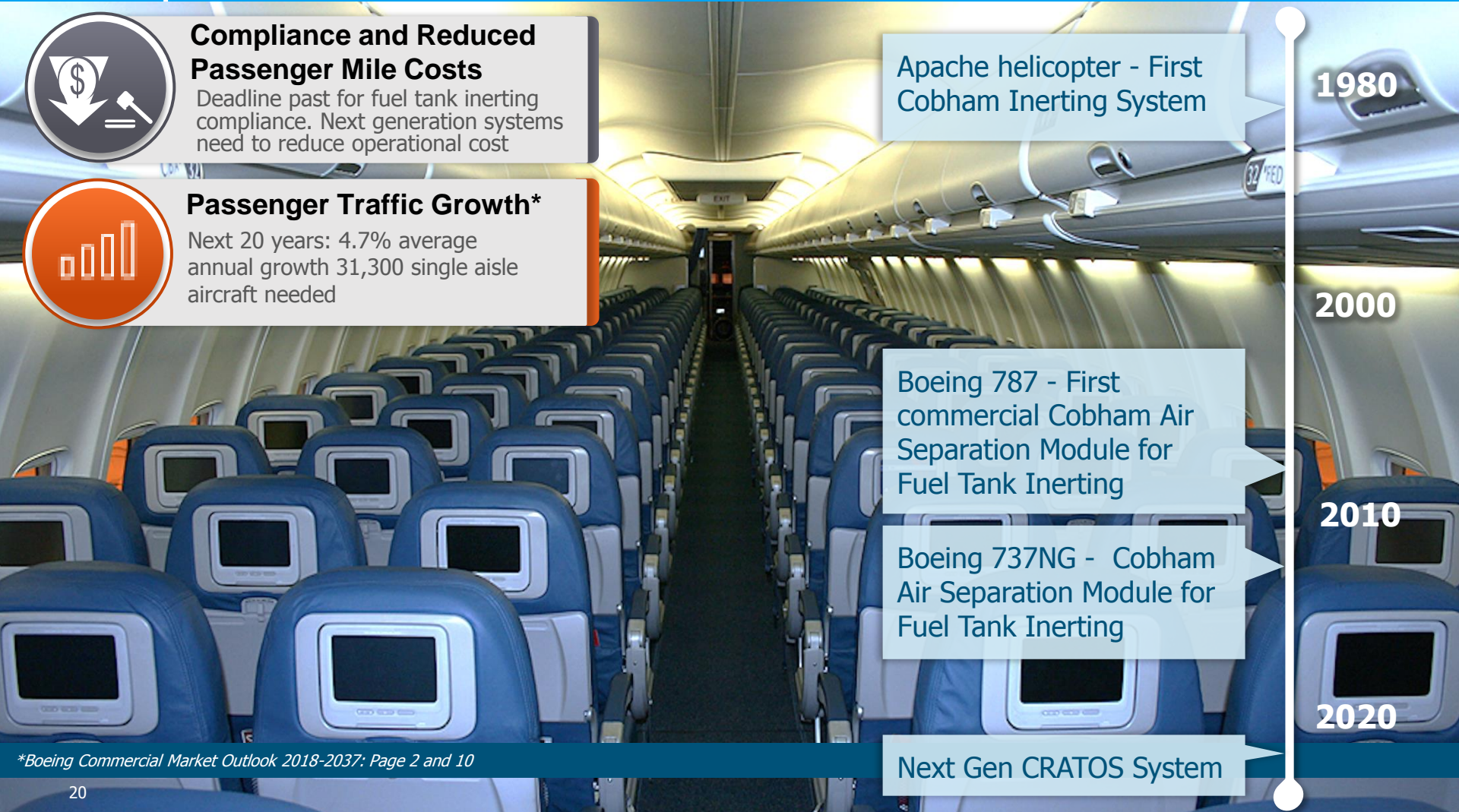
### Compliance and Reduced Passenger Mile Costs

Deadline past for fuel tank inerting compliance. Next generation systems need to reduce operational cost



### Passenger Traffic Growth\*

Next 20 years: 4.7% average annual growth 31,300 single aisle aircraft needed



Apache helicopter - First Cobham Inerting System

1980

2000

Boeing 787 - First commercial Cobham Air Separation Module for Fuel Tank Inerting

2010

Boeing 737NG - Cobham Air Separation Module for Fuel Tank Inerting

2020

Next Gen CRATOS System

\*Boeing Commercial Market Outlook 2018-2037: Page 2 and 10

# FAA Regulation Opening Commercial Market to Military Technology

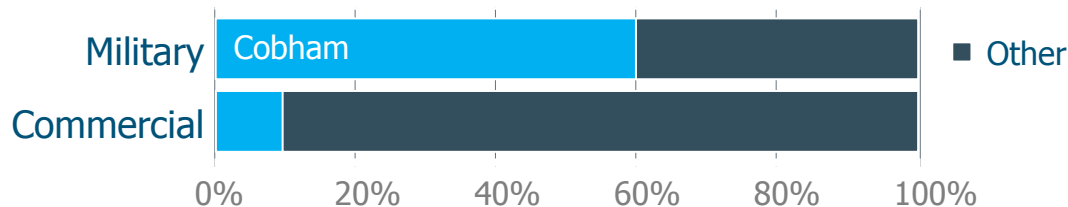
## Competitive Position

- Fuel Tank Inerting Systems (FTIS) for commercial market after 2008 FAA regulation change; adopted by rest of the world
- Created approximately \$300M\* per year commercial market for OEM and aftermarket
- 737NG Air Separation Module (ASM) adopted by four of the five major US airlines. International airlines pending
- Currently have the leading market share position in military market

## Differentiators

- Increased replaceable ASM operating life
- Smaller and lighter FTIS using less bleed air
- Reduced airline flight hour operational cost

## Market Share\*



\*Forecast International, Boeing Commercial Market Outlook 2018-2037, Airbus Global Market Forecast 2018-2037 Dataset, Company Info

# Total Market Opportunity Over Next 10 Years \$3.5B to \$4.5B\*



## CHALLENGE

Record backlog for commercial aircraft. Current legacy systems are difficult to maintain and expensive.

## OPPORTUNITY

FAA regulation and demand for new commercial aircraft drive solution for affordable and efficient FTIS technology.

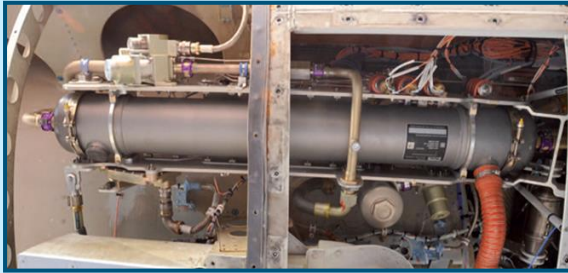
## SOLUTION

Utilize leading air separation and control technology to create a better FTIS product offering.

## RESULT

FTIS that extends useful life and improves performance and reduced operating costs.

# Progression from Aftermarket ASM to Fully Integrated FTIS Product



Current FTIS

- First Generation System
- Difficult to maintain and expensive to operate for the airline



Replacement ASM

- Replacement component for first generation system
- Longer life versus OEM supplied ASM
- Reduced flight hour costs from longer life
- Currently authorized for 737NG, 737MAX, A320



Project CRATOS Solution

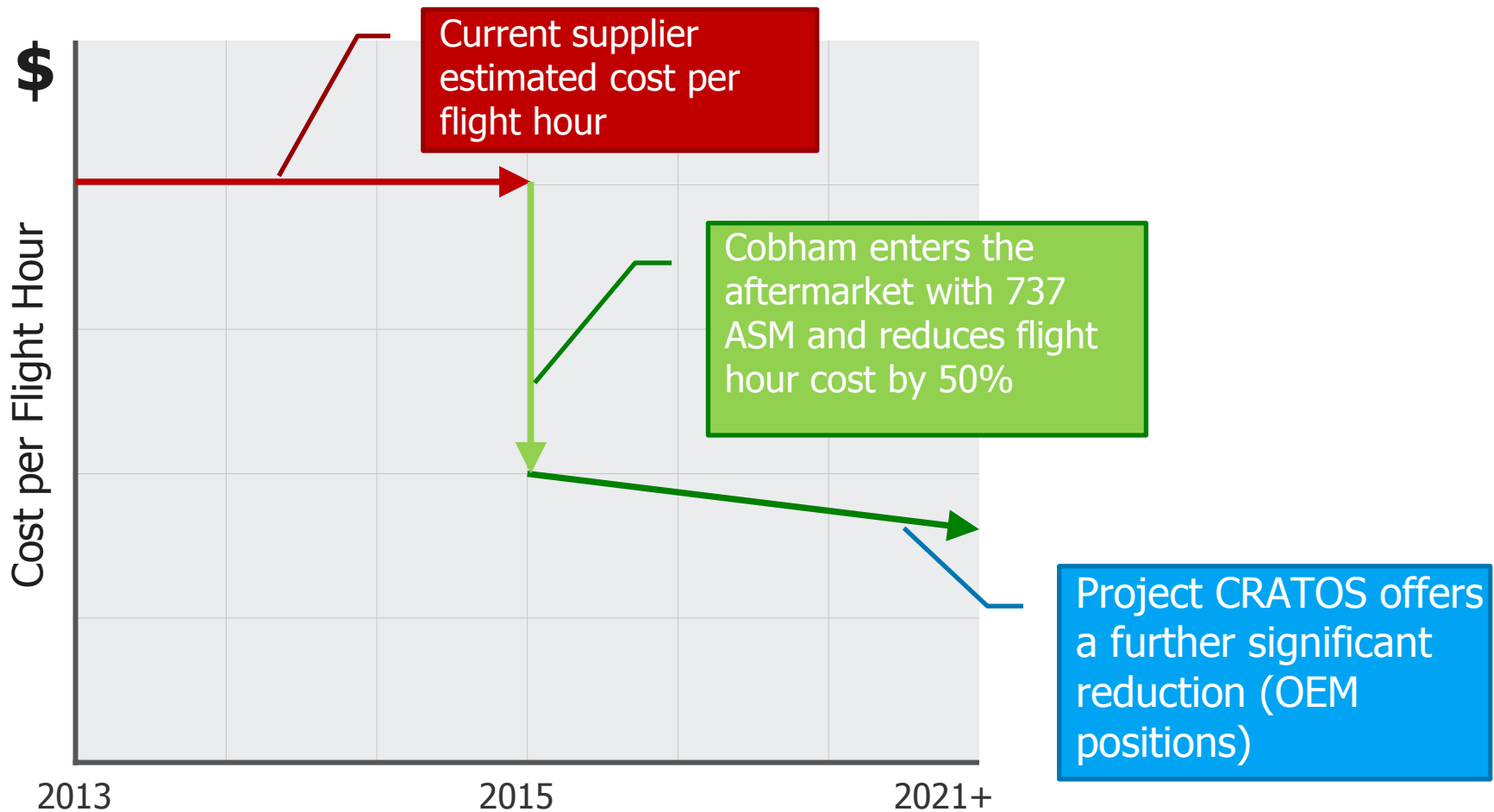
- Second generation system
- Intended for future - build aircraft
- Smaller and lighter FTIS using less bleed air
- Further reduced airline flight hour operational cost over replacement ASM for first generation systems



# Technology Drives Best Value for Airlines

## Airline Flight Hour Operating Costs

737 Narrow Body FTIS Cost Trend



# Aligned to High Growth Single Aisle Commercial Aircraft Market

With over 35 years of pedigree in military Fuel Tank Inerting, we are leveraging our experience to address commercial aircraft market

## Addressable Market:

- The commercial Fuel Tank Inerting market is valued at \$3.5B to \$4.5B over 10 years\*

## Market Positions:

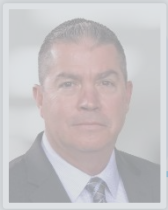
- 787 Dreamliner – over 800 Air Separation Modules sold since 2009
- 737NG - have secured 4 of the top 5 US airlines to long term agreements for the 737NG after-market Air Separation Modules
- 737NG and A320 - continue to pursue the international aftermarket

## Technology Investment:

- Cobham has positioned technology investment to expand beyond the Air Separation Module to a Fuel Tank Inerting System.
- The new technology developed extends life and performance providing airlines with a lower cost of operation

**Technology Developments Drive Market Share Gains**

# Today's Speakers



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Sector President CMS

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Mr. Ken Kota  
Sr. VP Business Development & Strategy CMS

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Mr. Kevin McKeown  
VP & GM Davenport Business Unit

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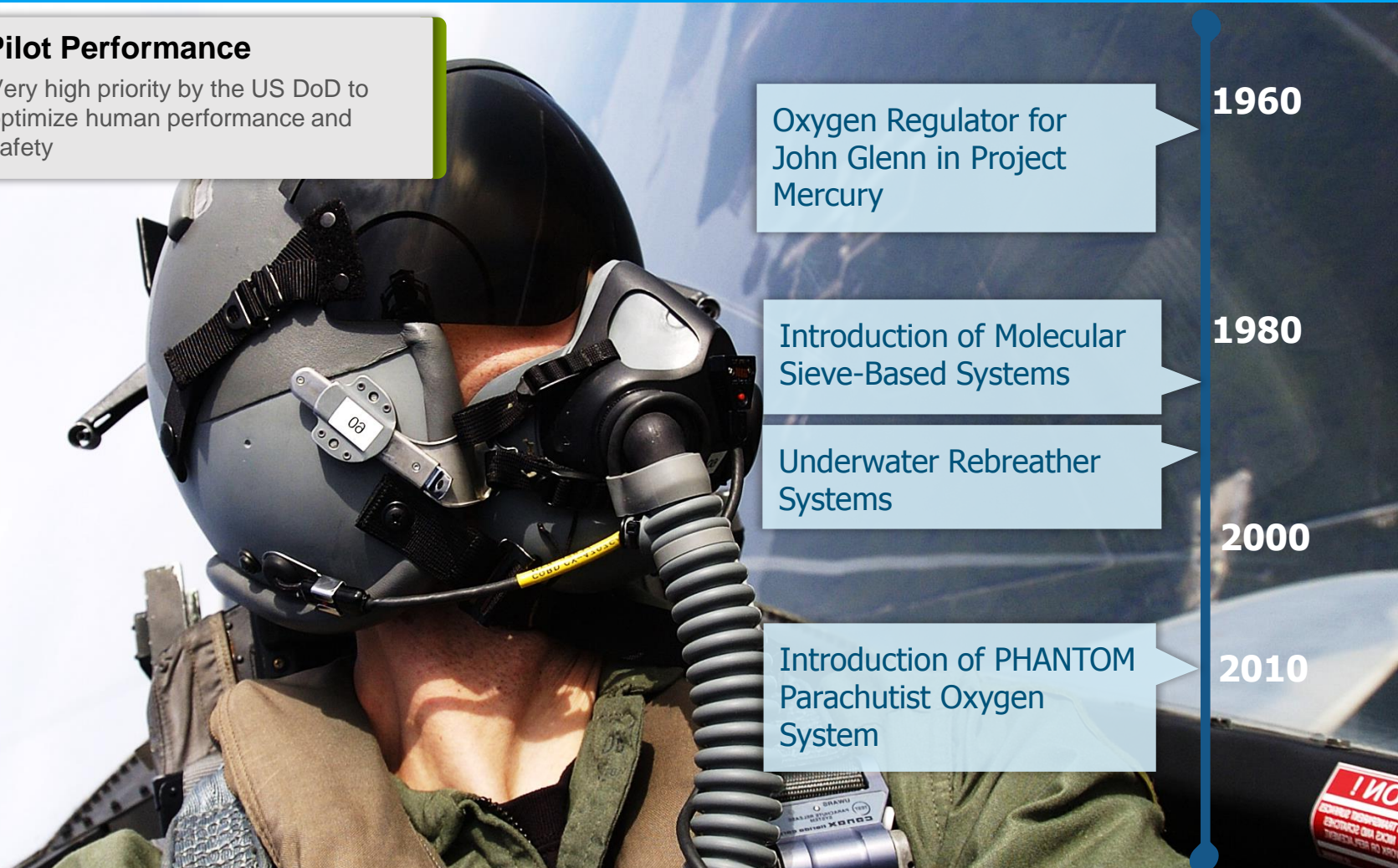


# 03

## Oxygen Systems

### Pilot Performance

Very high priority by the US DoD to optimize human performance and safety



Oxygen Regulator for John Glenn in Project Mercury

1960

Introduction of Molecular Sieve-Based Systems

1980

Underwater Rebreather Systems

2000

Introduction of PHANTOM Parachutist Oxygen System

2010



# Pedigree & Superior Technology Sustain Our Position

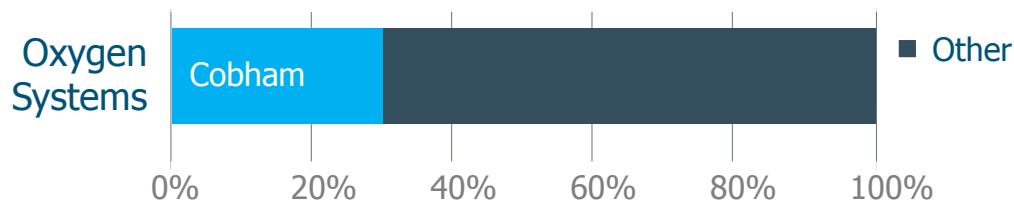
## Competitive Position

- We have secured every major platform we have pursued over the last 2+ years
- Our sensor technology opening up a new market
- USAF T-X is the current major competition

## Differentiators

- Reduced maintenance requirements
- Market-leading sensor capability
- Weight, size and power consumption

## Market Share\*



\*Forecast International, Counterpoint Market Intelligence (Aerospace Environmental Control Systems)

## Major Platforms Secured



KF-X



Market Confidential

# Total Global Market Opportunity Over Next 10 years of More Than \$3B\*



## CHALLENGE

Aircraft now outperforms human capacity to safely fly the airplane.

## OPPORTUNITY

Over 3,000 sensors on today's 5<sup>th</sup> generation fighters, but **NO** sensors monitoring the pilot physiology.

## SOLUTION

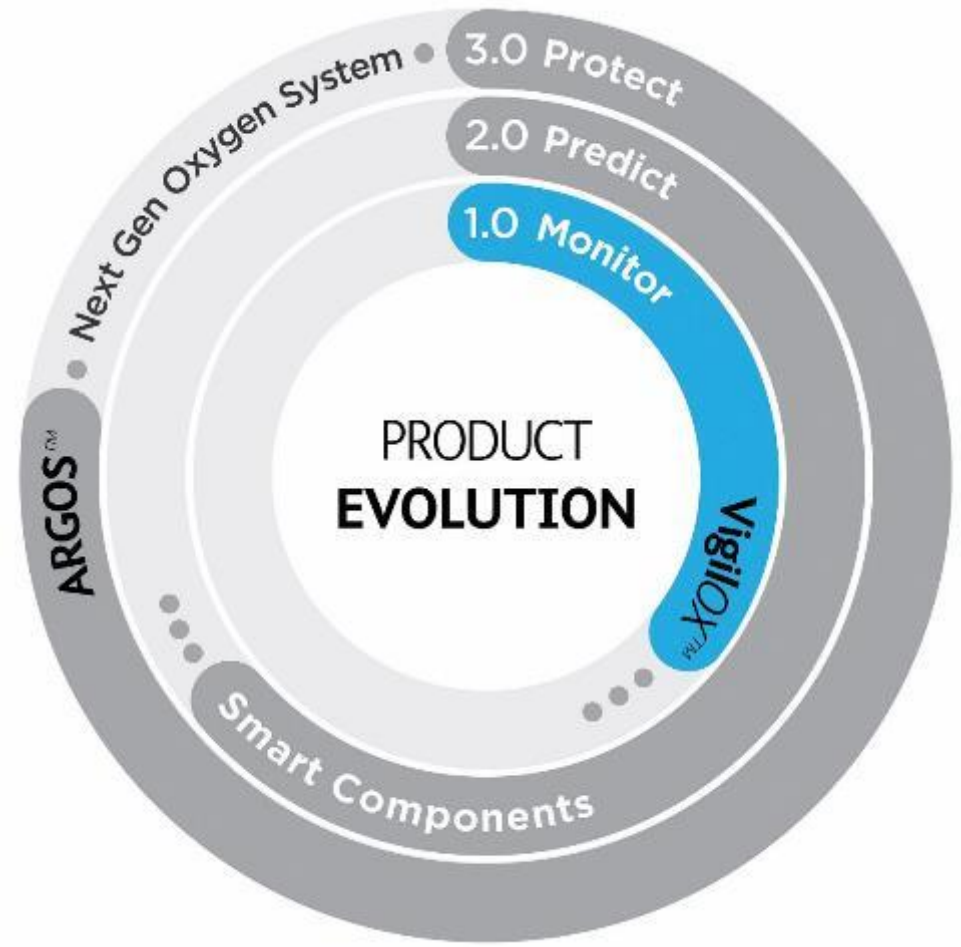
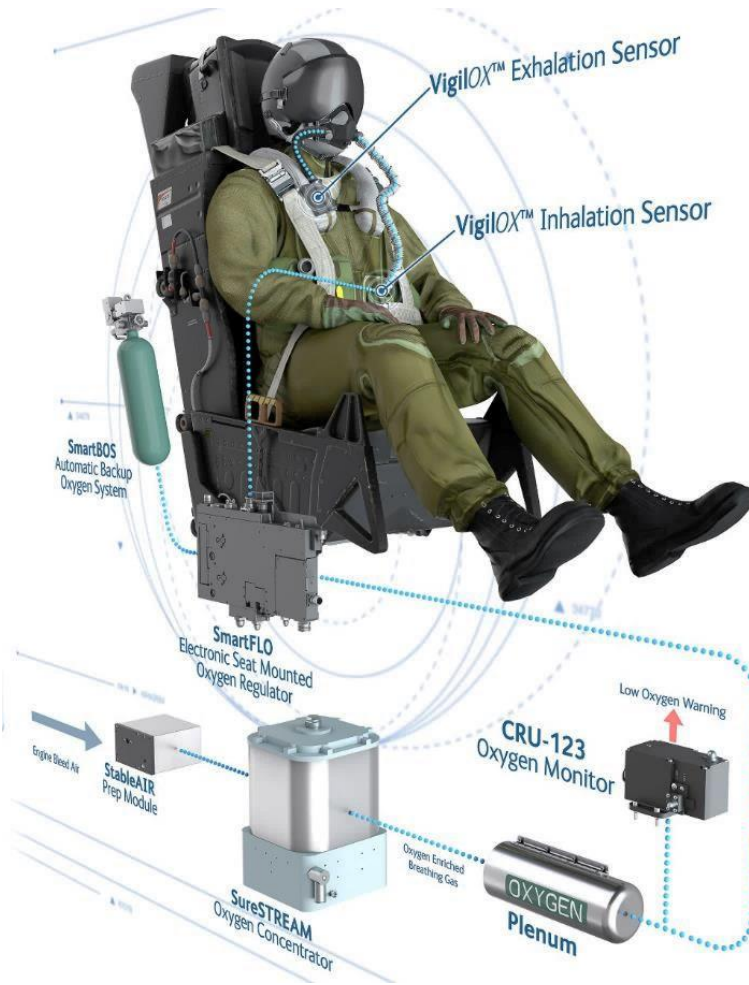
Create a fully integrated life support system with breathing sensor technology to monitor cockpit conditions and pilot physiology.

## RESULT

Become first company to offer responsive life support system for pilots to better endure extreme conditions.

\*Forecast International, Counterpoint Market Intelligence (Aerospace Environmental Control Systems)

# A Progression of Technologies for Enhanced Pilot Performance



- 50 year history and legacy of high performance oxygen components for tactical aircraft, space and extreme environments
- Record levels of new tactical and training aircraft with worldwide recapitalization underway
- Aircraft technology outpacing human performance
- Leveraging expertise and pedigree for future development through optimized components and smart tech to create first-of-its-kind, fully integrated smart oxygen system
- Market opportunity more than \$3B over the next 10 years\*

**Strong & Growing Base Business; Technology Underpins Next Gen Systems**

*\*Forecast International, Counterpoint Market Intelligence (Aerospace Environmental Control Systems)*



**Questions?**

<b>EVENT</b>	<b>PRESENTER</b>	<b>TIME</b>
Welcome & Introduction	<b>David Lockwood</b> CEO, Cobham plc	10:00
Overview of Cobham Mission Systems (CMS) Sector	<b>Jim Barber</b> Sector President CMS	10:20
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- **Deep technical expertise and differentiation – we do things others can't**
  - Hose and Drogue: Closed loop capability; simulation and modelling
  - Inerting: Smaller, lighter, increased life and lower cost per mile
  - Oxygen: Leading sensor and system capability; size, weight and power
  
- **Long heritage, reputation and strong market positions;**
  - Proven track record of technology leadership
  - Leading positions in specialist markets
  
- **Attractive growth opportunities – addressing international markets**
  - Hose and Drogue: Growing installed base; aftermarket
  - Inerting: Single aisle commercial aircraft
  - Oxygen: Fully integrated smart oxygen systems
  
- **Execution key to growth and enhancing operating margin**
  - Optimising processes from supply chain to customer delivery

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