WELCOME

Peter CAMPBELL
Vice President, Investor Relations
AGENDA

1:00 - 1:10  ➔ Welcome
1:10 - 1:15 ➔ Chairman’s remarks
1:15 - 1:40 ➔ CEO perspective
1:40 - 2:40 ➔ CFM56-LEAP: Transition and Aftermarket
2:40 - 3:30 ➔ Aircraft Equipment: Landing Systems and Electrical Systems
3:30 - 4:00 ➔ Break
4:00 - 5:00 ➔ Technology: R&T, Helicopters and Analytics
5:00 - 5:25 ➔ Finance in support of strategy
5:25 - 6:00 ➔ Conclusion
6:00 ➔ Dinner cocktail
SAFE HARBOR STATEMENT

These documents contain forward-looking statements. All statements other than statements of historical fact in this presentation, including, without limitation, those regarding our financial position, business strategy, management plans and objectives for future operations, are forward-looking statements. These statements may be identified by words such as "expect," "look forward to," "anticipate," "intend," "plan," "believe," "seek," "estimate," "will," "project" or words of similar meaning. We may also make forward-looking statements in other reports, in presentations, in material delivered to shareholders and in press releases. In addition, our representatives may from time to time make oral forward-looking statements. These forward-looking statements are subject to both known and unknown risks, uncertainties and other factors, which may cause our actual results, performance or achievements, or industry results, to be materially different from those expressed or implied by these forward-looking statements. These forward-looking statements are based on numerous current expectations and assumptions regarding our present and future business strategies and the environment in which we expect to operate in the future. Important factors that could cause our actual results, performance or achievements to differ materially from those in the forward-looking statements are set out in our Annual Report and include, among other factors:

- the cyclical nature of the aviation market;
- the effects of exceptional and unpredictable events;
- the impact of changes in competition;
- fluctuations in exchange rates;
- our ability to maintain high levels of technology.

Forward-looking statements speak only as of the date of this presentation and we expressly disclaim any obligation to release any update or revisions to any forward-looking statements in this presentation as a result of any change in our expectations or any change in events, conditions or circumstances on which these forward-looking statements are based.
DEFINITIONS

All figures in this presentation represent Adjusted data

Safran’s consolidated income statement has been adjusted for the impact of:

- Purchase price allocations with respect to business combinations. Since 2005, this restatement concerns the amortization charged against intangible assets relating to aircraft programmes revalued at the time of the Sagem-Snecma merger. With effect from the first-half 2010 interim financial statements, the Group has decided to restate the impact of purchase price allocations for business combinations. In particular, this concerns the amortization of intangible assets recognized at the time of the acquisition, and amortized over extended periods, due to the length of the Group’s business cycles, along gains or losses remeasuring the Group’s previously held interests in an entity acquired in a step acquisition or assets contributed to a JV.

- The mark-to-market of foreign currency derivatives, in order to better reflect the economic substance of the Group’s overall foreign currency risk hedging strategy:
  - revenue net of purchases denominated in foreign currencies is measured using the effective hedged rate, i.e., including the costs of the hedging strategy,
  - all mark-to-market changes on foreign currency derivatives hedging future cash flows is neutralized.

The resulting changes in deferred tax have also been adjusted

Recurring operating income

- It excludes income and expenses which are largely unpredictable because of their unusual, infrequent and/or material nature such as impairment losses/reversals, capital gains/losses on disposals of operations and other unusual and/or material non operational items

Civil aftermarket (expressed in USD)

- This non-accounting indicator (non audited) comprises spares and MRO (Maintenance, Repair & Overhaul) revenue for all civil aircraft engines for Snecma and its subsidiaries and reflects the Group’s performance in civil aircraft engines aftermarket compared to the market.
CEO PERSPECTIVE

Philippe PETITCOLIN
CEO
MARKET DRIVING FORCES FOR SAFRAN

1. The civil aerospace market offers attractive resilient growth perspectives, outperforming world GDP growth

2. Aircraft manufacturers are implementing stepwise product improvement strategies before the next generation aircraft (2030+): incremental innovation is mandatory in parallel with the preparation of disruptive innovation

3. More electrical power on-board: a great opportunity to optimize propulsive vs. non-propulsive energy, a game changer

4. The momentum in defence markets and the complexity of modern threats create needs for equipments in high-tech niches, serving dual use applications (IR sensors, precision navigation systems, critical electronics, UAV)

5. The digital revolution is about new business opportunities (e.g. digital identity), new ways of doing business (e.g. smart MRO), better efficiency (e.g. big data to improve industrial process control)… but potentially new types of players.

6. Our markets (commercial and governmental) are affected by the global economic environment with resulting heavy pressure on cost and new economic models (public-private partnerships, amortization of investments in recurring revenues)
COMMERCIAL AVIATION: STRONG / RESILIENT PROSPECTS
2015-2034 COMMERCIAL AVIATION MARKET OUTLOOK

Source: Snecma Market Strategy - cross-matched with Airbus and Boeing market assumptions

20-year Annual Economic Growth
+3.1%

20-year Annual RPK Traffic Growth
+4.7%

20-year Annual Global Fleet Growth
x1.9

20-year New Aircraft Deliveries
37,500

Planned 20-Year Deliveries of New Aircraft

- TURBOPROP AIRCRAFT: 2,700
- REGIONAL JETS: 3,600
- SHORT-MEDIUM RANGE AIRCRAFT: 22,400
- LONG RANGE AIRCRAFT: 8,800

Economic Growth: +3.1%
RPK Traffic Growth: +4.7%
Global Fleet Growth: x1.9
New Aircraft Deliveries: 37,500
Top 2034 Traffic Flows (RPKs)

The 3 largest flows will be domestic (China, Europe, North America)
The 2 largest international flows will be America-centric (w/ Europe, w/ China)
Traffic doubles every 15 years, exceeding world GDP growth

Pauses in traffic growth are recovered rapidly

Traffic growth turns into growth in engine flight hours
  • Attractive recurring revenues in aftermarket

Traffic growth calls for fleet expansion
  • Fleet size increase = (OE deliveries) – (removals)
  • Quality of the backlog
COMMERCIAL AVIATION MARKET RESILIENCE
TRAFFIC DOUBLES EVERY 15 YEARS – PAUSES ARE RECOVERED RAPIDLY

1980-2034 Passenger Network, Worldwide

Air traffic has doubled every 15 years

2014 – 2034
RPK GROWTH
+4.7%

GULF WAR
9/11

LEHMAN & FINANCIAL CRISIS

Air traffic will double in the next 15 years

Sources: Snecma Market Strategy, OAG

0 2 000 4 000 6 000 8 000 10 000 12 000 14 000 16 000 18 000 20 000
RPK– Revenue Passenger Kilometer (in billions)
STRATEGIC DIRECTIONS - AEROSPACE PROPULSION
COMMERCIAL AVIATION

➔ The 18-50 klbf thrust-class is core and key (CFM JV)
  • Addresses the bulk of the market (small-medium range = 60% of aircraft deliveries in the 2015-2034 time frame)
  • The LEAP OE production will probably go beyond 2035, with aftermarket revenues beyond 2060
  • The CFM partnership is the framework for the development of a new engine suited for a potential middle-of-market aircraft
  • R&T projects support the preparation of next-generation engines

➔ Safran is risk-sharing partner of GE on large commercial engines (GE90➔GE9X, GP7200…)

➔ Safran as a full-fledged commercial engine manufacturer
  • The full spectrum of technologies: advanced metallic and composite materials, FADEC, low emission combustor, high pressure single-crystal turbine blades, TiAl blades…
  • Regional (SaM146) and bizjet segments (Silvercrest) give access to markets adjacent the CFM partnership
    - SaM146 for SSJ100: in operation – positive feedback from airlines (Interjet, Cityjet)
    - Silvercrest for Dassault Falcon 5X: development in progress
STRATEGIC DIRECTIONS - AEROSPACE PROPULSION

MILITARY

M88 – Rafale

- Combat-proven reliability and performance
- Export contracts drive investments to triple the monthly production rate (from 2 to 6 engines)
- Attractive prospects in revenues and margins with the mix of domestic and export contracts

Future military aircraft and engines are likely to be developed in European cooperation

- The TP400 for A400M Atlas has paved the way for cooperation
- The FR-UK FCAS program (Future Combat Aircraft System) is setting a framework for this cooperation
  ➔ Safran / Rolls-Royce is the engine team
- Safran R&T effort is preparing cutting-edge engine technologies that will serve both military and commercial designs
  (ex: ceramic turbine blades)

Services

- Good prospects linked to demonstrated utilization of M88 and M53 and order book for M88 and TP400
- Improve operational efficiency of the industrial support for in-service military engine fleet.
  Safran site opened in 2015 close to French Air Force Logistics Support Command (Bordeaux, France)
The helicopter market is currently facing headwinds

- The cyclicality of segments exposed to macroeconomic influences is more pronounced than in commercial aviation
  - Oil&Gas is the most profitable segment (flight hours), suffers today from the dramatic drop of oil prices that turns into strong reduction of exploration programmes at energy companies
- Both OE sales and flight hours are affected
- Low-tide production level reached in 2015

Strategic directions for helicopter engines

- Renew the existing turboshaft portfolio
  - Arrius 2R for the Bell 505
  - Arrano 1A for Airbus H160
- Develop high power engines (up to 3,000 shp)
- Investigate hybrid propulsion systems mixing different sources of power (for emergency regimes, for cruise optimization)
- Leverage the strong commercial position of Turbomeca in emerging countries with large markets (China, India)
Safran and Airbus have decided to join forces in space launchers to reshuffle competitiveness of European access to space

- Creation of the 50/50 Airbus Safran Launchers JV in place since January 2015
- All space launchers-related assets and technologies are contributed by the mother companies to ASL. This comprises ballistic missile programmes and associated industrial assets
- Safran is contributing mainly the liquid space propulsion of Snecma and the solid propulsion of Herakles, plus related participations in existing JVs (with Avio in particular for solid propulsion)
- Balancing the value of respective contributed assets in a co-controlled JV will result in a balancing payment from Safran to Airbus

Status to date

- ASL is currently running Ariane 5 (in service), Ariane 6 (in development) and ballistic missile development and production programs
- Ariane 5 has an unprecedented flight record of 71 successes in a row
- The Ariane 6 initial development contract has been signed with ESA in August 2015. The contract to completion is to be negotiated in 2016
- ASL is acquiring a majority stake in Arianespace to streamline operations and reduce launch costs, subject to customary regulatory approval
STRATEGIC DIRECTIONS - AIRCRAFT EQUIPMENT
LANDING SYSTEMS

Strong positions in long lasting high volume programs through:

• More than 20,000 aircraft in service with Safran-MBD landing gear

• Wheels and Brakes: over 7,500 aircraft equipped with carbon brakes – high visibility on recurring revenues with fee-per-landing business model

• A success story sustained by a continuous effort in differentiation through innovation and technology
  - Carbon as a spin-off of space propulsion research in high temperature materials
  - Titanium cutting-edge metallurgy

Strategic directions

• Industrial productivity and capacity

• Development of worldwide MRO footprint

• Technology and innovation
  - Next generation carbon grade
  - Electric green taxiing system (EGTS)
Safran has invested to complement and develop the portfolio of technologies and equipments of the aircraft power systems

- Power generation with APU: acquisition by Microturbo of two bizjet programs from Pratt&Whitney in 2014
- Electric power generation: acquisition of GEPS in 2013
- Wiring: Labinal is world leader
- Power distribution: acquisition of Eaton PDMS division in 2014

Strategic directions

- Increase the maturity of the portfolio (variable vs. constant frequency equipments, solid-state power controllers, high power density generation and distribution, power and data transmission, user-friendly fault-detection in electrical chains...)
- Define with airframers optimized electrical architecture for incremental and disruptive aircraft evolutions
Nacelles procurement process

- Large commercial aircraft manufacturers select and procure nacelles separately from the selection of engines
  - exception: COMAC decided to procure an IPS (Integrated Propulsion System = engine + nacelle) for the C919
- Bizjet makers select and procure an IPS with very demanding design and performance requirements for the nacelle

Safran-Aircelle

- Enjoys strong positions in the bizjet segment
- Exposed to A380 program volume variations, and unfavorable position in the aftermarket value chain of A320ceo
- Has captured two programs that will sustain mid-term sales growth and improve profitability:
  - the A320neo nacelle for the LEAP (OE and aftermarket) as prime contractor
  - the A330neo nacelle
- Has captured the nacelles for C919 (commercial) and Passport (bizjet)
- Is leveraging innovative technologies to reduce engine noise, accommodate higher engine temperatures, implement electric thrust reverser actuation for operational flexibility
- Strategic focus is on the development of positions in aftermarket
Safran-Hispano-Suiza is the specialist in engine mechanical transmission systems

- The economics of Hispano relies on two business streams:
  - Centre of competence for Accessory Drive Trains (ADT) serving Safran and CFM engines
  - Supplier of ADT for Rolls-Royce engines (Trent and bizjet engines)

- Hispano-Suiza has strengthened the business relationship with Rolls-Royce in the long run
  - Creation in 2015 of Aero Gearbox International (AGI)
    - 50/50 JV between Hispano and Rolls-Royce
    - Exclusive supplier of ADT for new Rolls-Royce engine programs

Strategic directions

- Improve competitiveness
  - Industrial footprint in Poland is instrumental to control costs

- Execute the technological roadmap to support future high bypass ratio engine architectures
STRATEGIC DIRECTIONS - DEFENCE

Safran-Sagem addresses directly niche defence market segments

- Inertial navigation systems
  - #1 in Europe, #3 worldwide
  - Mastering all key technologies: mechanical, laser and vibrating sensors / data treatment
- Optronics
  - #1 in Europe, #4 worldwide
  - High performance systems based on infrared detectors
- The combination of these technologies
  - a unique asset for critical applications in Defence and Aerospace ➔ ex: the Patroller

Safran-Sagem is the center of excellence of Electronics for the Group

- A key success factor for Safran:
  - Critical calculators for engines, equipments, avionics, …
  - Embedded solutions (hardware & software) in harsh environments

Strategic directions

- Improve competitiveness (cost, time-to-market)
- Preserve the competitive advantage through innovation and R&T: new sensors (IR, MEMS) and data processing embedded in multi-function equipements
- Increase commercial market penetration of dual-use products
  - Acquisition of Eaton Integrated Cockpit Solutions in 2015
  - Develop export military sales through partnership
STRATEGIC DIRECTIONS - DEFENCE
THE PATROLLER IS ICONIC OF THE VALUE BROUGHT BY SAGEM

HIGH-SPEED DATA LINK
Real-time control of the drone and its mission payload

AVIONICS
Guarantees in-flight reliability & controllability

RADAR
All-weather observation and ground target search

GROUND CONTROL STATION
Data reception, analysis and transmission to front-line units

GYROSTABILIZED OPTRONIC POD
Day/night, long-distance observation and identification
STRATEGIC DIRECTIONS – SECURITY

➡️ Safran-Morpho has developed a strong position in security businesses based on technological differentiation

- Detection: CT, trace detectors
- Biometrics for identity and security solutions

➡️ The digital transformation in services is driving growth in identity and security-related businesses

- The market is moving to new areas, with double-digit growth prospects
  - e-commerce, e-banking, on-line parapublic services, digital authentication…
- Capturing growth requires significant cash consumption to invest in activities with a different risk profile from the rest of Safran’s portfolio

➡️ Safran is considering a strategic move

- Morpho Detection: discussions with several potential acquirers – exclusive negotiation and signing in the coming weeks
- Review of strategic options to be conducted for the Morpho security and identity businesses
STRATEGY WRAP UP

- The future of Safran is the aerospace and defence markets
- The security market has its own characteristics and is becoming more and more digital
- For the next 25 years, the CFM partnership with GE will remain the core of our strategy in propulsion
- Outside the scope of this Joint Venture (business jets, regional, military, helicopters, …) Safran will remain open to any value-creating cooperation
- In the aerospace equipment segment, our landing systems and electrical businesses are self-sustaining and should work to maintain their position of world leader
- Our nacelle business will take advantage of the recent wins (A320neo, A330neo) which will represent 50% of its activity in 2020
STRATEGY WRAP UP

- Opportunities which will reinforce our footprint in aerospace equipment, with a DNA (High Tech / Tier 1 / recurrent services aftermarket) close to ours will be looked at, with appropriate financial discipline

- Our defence business is a niche business and we are happy with it

- In security, we have decided to put our detection activity up for sale

- The strategic options for identity and security business are under review and we do not rule out any option
PART I.
CIVIL ENGINES
CFM56 LEAP TRANSITION

Olivier ANDRIÈS
CEO, Snecma
**LEAP – BEST IN CLASS**

<table>
<thead>
<tr>
<th>Fuel efficiency</th>
<th>NOx</th>
<th>Noise</th>
<th>Reliability</th>
<th>Maint. cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>15% better vs. CFM56</td>
<td>50% lower vs. CAE 6</td>
<td>New regulation compliant (chapter 14)</td>
<td>Same as CFM56 ... best in industry</td>
<td>99.98% Departure reliability</td>
</tr>
</tbody>
</table>

- **Technology**
- **Materials**
  - New Composites
  - New Alloys
- **Experience**
- **Execution**
- **Full Technology Pipeline**

- Performance & reliability
- Potential for improvement
LEAP – MARKET SHARE

As of February 29, 2016

CFM LEAP
- A320neo 1,571 a/c (55% m.s.)
- 737 MAX 3,129 a/c
- C919 517 a/c
  5,217 a/c

PW1000G Series
- A320neo 1,264 a/c (45% m.s.)
- C Series 403 a/c
- MC-21 176 a/c
  1,843 a/c

CFM LEAP
- 5,217 AC 74%

PW1000G
- 1,843 AC 26%
100 CUSTOMERS, ALL AROUND THE WORLD

A320neo
1,571 AC announced
29 customers

737 MAX
3,129 AC announced
67 customers

C919
517 AC announced
21 customers
### LEAP – RIGHT ON TRACK

<table>
<thead>
<tr>
<th>Year</th>
<th>LEAP-1A (Airbus A320neo)</th>
<th>LEAP-1B (Boeing 737 MAX)</th>
<th>LEAP-1C (Comac C919)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>Design freeze</td>
<td>Design freeze</td>
<td>Design freeze</td>
</tr>
<tr>
<td>2013</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; engine to test</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; engine to test</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; engine to test</td>
</tr>
<tr>
<td>2014</td>
<td>FTB</td>
<td>FTB</td>
<td>FTB</td>
</tr>
<tr>
<td>2015</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; flight</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; flight</td>
<td>Roll out</td>
</tr>
<tr>
<td>2016</td>
<td>EIS</td>
<td>EIS</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; flight</td>
</tr>
<tr>
<td>2017</td>
<td>EIS</td>
<td>EIS</td>
<td>EIS</td>
</tr>
</tbody>
</table>

*Engine development schedule unchanged for 5 years!*
LEAP – A THOROUGH TESTING PROGRAM

➔ 9,100 hours and 19,500 cycles of Engine testing
  • Fan Blade Out, Ingestions (birds, water, hailstones, ice slabs), Icing, Block test, Cross wind, Vibration endurance, HP and LP Module Aeromechanics…

➔ 2,000 Engine Flight Hours accumulated
  • Flying Test Beds
  • A320neo/A321neo
  • 737 MAX

Proven Performance
LEAP-1A

Program Execution

- Engine testing (1A/1C): 5,300 hours, 13,900 cycles
- A320neo First Flight in May 2015
- A321neo First Flight in Feb 9, 2016
- Flight test campaign: 3 aircraft, more than 220 flights and 550 flight hours, excellent engine behaviour

Performance

- Engine certified: Nov 2015
- Performance at spec @ EIS

Agenda

- Entry Into Service mid 2016
LEAP-1B

Program Execution

- Engine testing: 3,800 hours, 5,600 cycles
- 737MAX flight test campaign: 2 aircraft, first flights on Jan 29 and March 4, 2016
- 35 flights and 89 flight hours already accumulated, excellent engine behaviour

Performance

- Performance at spec @ EIS

Agenda

- 737 MAX flight test campaign supporting 2017 EIS
LEAP-1C

Program Execution

- Engine testing (1A/1C): 5,300 hours, 13,900 cycles
- C919 roll-out Nov 2, 2015

Performance

- Performance at spec @ EIS

Agenda

- C919 first flight: expected 2016
LEAP – RAMP UP

- CFM56 production record level in 2016
- LEAP production will reach a 30% higher rate
- Everything in place to manage a smooth transition and ramp-up
- Large volumes and steep ramp-up are an opportunity to get costs down faster

Full transition in 4 years

NUMBER OF ENGINES PRODUCED

<table>
<thead>
<tr>
<th>Year</th>
<th>LEAP</th>
<th>CFM56</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>1,612</td>
<td>-</td>
</tr>
<tr>
<td>2016e</td>
<td>1,650</td>
<td>-</td>
</tr>
<tr>
<td>2017e</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2018e</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2019e</td>
<td>-</td>
<td>2,000+</td>
</tr>
<tr>
<td>2020e</td>
<td>-</td>
<td>2,000+</td>
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<tr>
<td>2021e</td>
<td>-</td>
<td>2,000+</td>
</tr>
<tr>
<td>2022e</td>
<td>-</td>
<td>2,000+</td>
</tr>
<tr>
<td>2023e</td>
<td>-</td>
<td>2,000+</td>
</tr>
<tr>
<td>2024e</td>
<td>-</td>
<td>2,000+</td>
</tr>
</tbody>
</table>
LEAP – RAMP UP

➔ 100% of suppliers are well known vendors and aero suppliers – 80% are common with CFM56

➔ Redundancy and/or buffer stock for 100% of parts

➔ 85% of parts are double sourced

➔ Suppliers Selection - based on three main criterias: Supply Chain performance, Growth capacity (including financial criteria) and economic performance

➔ Leveraging Safran, GE and worldwide suppliers footprint

➔ Developing brand new plants for new technologies, Lean Manufacturing built in

Strong plan and actions in place to manage ramp-up
### LEAP – RAMP UP

### EXTENDING THE FOOTPRINT

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>SIZE</th>
<th>COUNTRY</th>
<th>SPECIALISATION</th>
<th>STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gennevilliers</td>
<td>1,500 m²</td>
<td>France</td>
<td>Precision forging</td>
<td>![ ]</td>
</tr>
<tr>
<td>Le Creusot</td>
<td>4,000 m²</td>
<td>France</td>
<td>Turbine disk machining</td>
<td>![ ]</td>
</tr>
<tr>
<td>Commercy</td>
<td>27,000 m²</td>
<td>France</td>
<td>3D composites RTM</td>
<td>![ ]</td>
</tr>
<tr>
<td>Villaroche</td>
<td>40,000 m²</td>
<td>France</td>
<td>Logistics for assembly and spares</td>
<td>![ ]</td>
</tr>
<tr>
<td>Suzhou</td>
<td>19,000 m²</td>
<td>China</td>
<td>Machining and assembly</td>
<td>![ ]</td>
</tr>
<tr>
<td>Querétaro</td>
<td>31,000 m²</td>
<td>Mexico</td>
<td>3D composites RTM and assembly</td>
<td>![ ]</td>
</tr>
<tr>
<td>Rochester</td>
<td>31,000 m²</td>
<td>USA</td>
<td>3D composites RTM</td>
<td>![ ]</td>
</tr>
<tr>
<td>Rzeszow</td>
<td>9,300 m²</td>
<td>Poland</td>
<td>Turbine blade and booster spool machining</td>
<td>![ ]</td>
</tr>
</tbody>
</table>

**SNECMA INTERNAL SHOPS EXTENSION**

Over 162,000 m² of extensions and new buildings in Europe, Asia and Mexico between 2012 and 2016

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EXTENDING THE FOOTPRINT

Close to 300,000 m² of extensions and new buildings worldwide from 2015 to 2018

SUPPLIERS SHOPS EXTENSION

<table>
<thead>
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<th>SIZE</th>
<th>COUNTRY</th>
<th>SPECIALISATION</th>
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<tbody>
<tr>
<td>60,000 m²</td>
<td>France</td>
<td>Part &amp; Blade Machining, Bearings, Casting</td>
</tr>
<tr>
<td>50,000 m²</td>
<td>Europe</td>
<td>Part Machining &amp; Casting</td>
</tr>
<tr>
<td>75,000 m²</td>
<td>USA</td>
<td>Casting &amp; Equipment</td>
</tr>
<tr>
<td>40,000 m²</td>
<td>Mexico</td>
<td>Composites, Equipment, Blade Machining</td>
</tr>
<tr>
<td>20,000 m²</td>
<td>Japan</td>
<td>Blade Machining</td>
</tr>
<tr>
<td>50,000 m²</td>
<td>China</td>
<td>Part Machining</td>
</tr>
</tbody>
</table>
LEAP – SAFRAN PULSE LINE

- Concept similar to CFM56 assembly (operational since 2009)
  - 3 parallel assembly lines composed of 5 working stations / 1 shift of lead time per station
  - Latest technologies including engine rotation (Safran patent)

- Main milestones
  - Suppliers’ selection: Feb 2015
  - Design freeze: Sept 2015
  - 1\textsuperscript{st} Line delivery: July 2016
  - 2\textsuperscript{nd} Line delivery: Jan 2017
  - 3\textsuperscript{rd} Line delivery: 2019

3 lines, capacity of 450 engines / year / line
ROUTE TO SERIAL MODE:
A DEDICATED PROJECT TO ASSESS AND MITIGATE GLOBAL RISKS FOR LEAP RAMP UP (SINCE 4Q2012)

- 220 suppliers Tier 1 and 25 Tier 2
- 10 Safran locations
- 50 Safran shops
- 6 Centres of Excellence including Quality Teams
- 1,200 parts numbers per engine model
- 250 baselines (refreshed every 6 months)

ROUTE TO SERIAL MODE
- Global control
- Risk consolidation from In House and suppliers analysis including CFM56/LEAP transition leading to an action plan
- Complete coverage through analysis of 59 families of parts
- Risk abatement Plan Monitoring

- Up to 60 dedicated people worldwide, common methodology and tool to all suppliers and Safran Shops, common dashboard
- In place up to end of ramp up to reach full rate

LEAP internal rate readiness

LEAP supplier rate readiness

INTERNAL SUPPLY CHAIN
EXTERNAL SUPPLY CHAIN

A ROBUST PRODUCT AHEAD OF EIS

ROUTE TO SERIAL MODE
- SPI
- SPRED
- RUN@RATE
- TECHNOLOGIES MATURATION
LEAP – RAMP UP

A ROBUST PRODUCT AHEAD OF EIS

Baseline Contents

Right to left planning

Load capacity analysis

Action plan

Outputs

Risk analysis

Industriализation Monitoring

SPI: standard milestones based on critical parameters and statistical analysis

All parts and all sources covered, 25 milestones

Manufacturing Concession Control

SPRED: Reduction of concession rate through blue print revision and process improvement

Expected production capability already reached, ahead of the ramp up
LEAP – RAMP UP

A ROBUST PRODUCT AHEAD OF EIS

WHAT IS RUN@RATE?

➡ Running at future production rate today
  • Five sets/week for 2 weeks in 2015
  • Will conduct annually for four years… repeating at next higher rate each time

➡ Used within CFM & with Suppliers
  • 70 sites total in 2015

➡ Designed to stress the system

➡ Applies to all facets… materials, production line, logistics

➡ Designed to make us look ahead
  • Mitigate risks we will face in the future
  • Implement lessons learned

Simulating future production rate during early ramp-up
LEAP – RAMP UP

A ROBUST PRODUCT AHEAD OF EIS

- ROUTE TO SERIAL MODE
- SPI
- SPRED
- RUN@RATE
- TECHNOLOGIES MATURATION

3D Woven Carbon Fiber Composite Fan blades and Fan case

3-D printed Fuel Nozzles

Improved alloy: Titanium Aluminide LPT blades

Improved alloy: Rene65 LPT disks

Ceramic Matrix Composite HPT shrouds
A ROBUST PRODUCT AHEAD OF EIS

LEAP – RAMP UP

EXEMPLE OF MATURATION FOR NEW TECHNOLOGIES:
3D WOVEN CARBON FIBER COMPOSITES FAN BLADE

- 1990’s: Technology and process evaluation
- 2000-2003: Joint Technical Development Program with our partner Albany IP
  - Goal: test and validate the technology to make a reliable and cost effective Fan Blade
  - Materials, mechanical properties and process capability
- 2004-2006: coupons, partial part and engine test performed with an aero design
  - 7 Bird strike tests done with woven Fan Blades
- 2007 - 2012: Mature Technology in a lab with Albany to improve robustness of process and design compliance
- 2012 - 2015: Construction of two new plants dedicated to 3D woven Carbon Fiber Technology
- 2014 - 2015: Delivery of first production parts and LEAP-1A Certification
- 2016: LEAP ramp up starts, construction of an additional manufacturing plant in Mexico

Over 2,500 3D woven carbon fiber fan blades produced for maturation ahead of production ramp up
MORE THAN 40 LEAP CUSTOMERS IN SERVICE WITHIN THE NEXT 3 YEARS

Rigorous preparation:

- Extensive work with airframers to leverage the Flight Test Campaign
- Documentation / Engine Shop Manual ready
- Tooling validated
- Expert FSE (Field Support Engineers) Program
- Dedicated EIS readiness program with each Customer, including comprehensive training
- EIS support stress tests with LRU (Line Replaceable Unit) providers
- MRO network ready

Ready to support our customers
CFM56 - LEAP AFTERMARKET

François PLANAUD
Executive Vice President Services and MRO, Snecma
CFM INSTALLED BASE EVOLUTION

- CFM fleet in service to grow by 4%+ annually over the next decade
  - 25,000 CFM56 engines in operation today
  - More than 27,000 CFM56 engines will be in operation in 2018

- New generation LEAP engines will relay CFM56
  - LEAP brings additional fleet growth potential

- By 2025, 11,000+ engines expected to be added to the fleet in service
CFM56 GEN 2 FLEET STILL VERY YOUNG

CFM56 Engine Fleet as of 2015

Age distribution

➔ In 2015:
• 50% of CFM56 fleet is below 10 years
• Average age of CFM56 Gen 2 fleet in service is below 8 years

➔ In 2025:
• Average age of CFM56 Gen 2 fleet in service remains below 15 years
CFM56 GEN 2 MAINTENANCE ACTIVITY STILL GROWING

As of 2015

19,000 +
Gen 2
in service

No shop visit performed on engine

As of 2020

22,000 +
Gen 2
in service

One shop visit or more

As of 2025

18,500 +
Gen 2
in service

2015: more than 60% of CFM56 Gen 2 in service have never had a shop visit

2025: the proportion is still close to 25%
SPARE PART CONSUMPTION FORECAST MODEL

A comprehensive combination of technical and market inputs
Deterministic parameters strong drivers for first shop visit
CONTINUALLY ADAPTING THE SPARE PART CONSUMPTION FORECAST MODEL

- More than 30 parameters statistically analyzed
- Customer base segmented into 10 categories

- Segmentation updates since 2013, driven by market evolution:
  - Some North American airlines, exiting Chapter 11 and benefiting from low fuel prices moved from low profitability to established legacies
  - High level of orders, deliveries and traffic growth in China lead to a specific forecast and analysis
  - Redistibution of BRICs airlines across existing segments
SHOP VISIT OUTLOOK

- Maximum shop visit activity on CFM56 around 2025

- CFM56 Gen 2 shop visit activity will grow by 50%+ over the next ten years

Worldwide CFM fleet shop visits

- CFM56 Gen 2
- CFM56 Gen 1
- LEAP
Most spare parts consumption on CFM56 Gen 2 engines is generated in the first 18-20 years of operation.
CFM56 SHOP VISIT RANK DISTRIBUTION

2015: shop visits #1 and #2 are the main drivers, representing more than 80% of CFM56 Gen 2 maintenance activity

2025: shop visits #1 and #2 will still represent 2/3 of activity
Expected CFM56 spare parts consumption profile

- Main contributors to spare parts consumption are now Gen 2 engine models
- In 2016, consumption is expected to have doubled since 2010, supported by a very favorable environment in 2014 and 2015
  - Oil price decrease
  - Traffic growth
- Trend grows faster and peaks higher than 2013 view, mainly due to greater CFM56 success in recent years

Forecast model confirms growth outlook for CFM56 spare parts
Used parts

- The spare part forecast model anticipates the increased use of Used Serviceable Material
- CFM Materials (a Snecma & GE joint venture) is prepared to address the future availability of used material for CFM56 Gen 2 engines
- Used material is also an opportunity to reduce material costs in RPFH service agreements
MARKET TRENDS: RATE PER FLIGHT HOUR SERVICE AGREEMENTS

- An increasing customer driven evolution towards “per hour” long-term service agreements
  - Airlines favor predictable operating costs and long term visibility

- Services product portfolio evolution
  - 10% of CFM56 fleet covered by RPFH* contracts from Safran, expected to remain stable
  - On LEAP, 22% of orders to date include a CFM RPFH contract
    - Assumption: 50 to 60% of the fleet to be supported under RPFH agreement
    - Possible reversion to Time & Material maintenance in the second part of engine life, and later in the program

- Gradual transition
  - LEAP fleet will represent ~18% of combined CFM fleet by 2020

- Opportunities for the engine OEM as an MRO provider
  - Maintenance cost & reliability key parameters in LEAP engine design and proven architecture choice
  - Deep knowledge of the engine and its maintenance costs over time through customer support activities
  - Continuous maintenance costs improvements over program life

---

Active installed fleet of CFM engines (estimate)

<table>
<thead>
<tr>
<th>Year</th>
<th>CFM56</th>
<th>LEAP</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*RPFH = Rate per flight hour contracts
RPFH SERVICES CONTRACT MANAGEMENT

**OFFERS**
- Enhanced pricing model
- Operators proximity

**CONTRACTS**
- Contract expertise
- Responding to customer demand with bespoke offers

**EXPERIENCE**
- Contract management & evolution
- Cost optimization
- CFM56 and GE90/GP7200 RFPH contracts background

**EXECUTION**
- OEM Product expertise
- Fleet management and time on wing optimization
- Cost effective workscopes & repair development
- Extended industrial capabilities
PART I.
Q&A
PART II.
AIRCRAFT EQUIPMENT
AIRCRAFT EQUIPMENT
LANDING AND BRAKING
SYSTEMS

Vincent MASCROÉ
CEO, Messier-Bugatti-Dowty
LEADING POSITIONS ON BRAKING & LANDING MARKETS

N°1 worldwide for Carbon Brakes for > 100 pax civil aircraft

N°1 worldwide for Landing Gear Systems for civil aircraft

7,250 people in 8 countries

€2.3 billion revenue Airbus + Boeing programs: 75%

WHEELS AND BRAKES

→ SALES · 99% aftermarket
  · 1% Others

→ Generally dual source
→ Revenue based on fee per landing
→ Carbon brakes replace steel brakes

LANDING GEAR & SYSTEMS

→ SALES · 57% OE
  · 43% aftermarket

→ Generally single source
→ OE sales to Airframers
→ Aftermarket sales to Operators & MROs

(2015 figures)
DIVERSIFIED CUSTOMER BASE & MARKETS

Sales per Customer type

50%  50%

AIRFRAMERS
Original Equipment (OE)

AIRCRAFT MNEs

AIRLINES & MROs
Aftermarket

~ 300 Airlines

~ 40 MROs, civil & military shops

Sales per Market

90%  10%

Commercial

Military

Sales per Customer type

50%  50%
WELL POSITIONED IN A GROWING COMMERCIAL AIRCRAFT MARKET

Wheels & Carbon Brakes

2014 | 2025e
---|---
Base 100 | 200

>100pax commercial aircraft fleet in service equipped with carbon brakes

Landing Gear & Systems

2014 | 2025e
---|---
Base 100 | 149

Maintaining a market share above 50% thanks to innovative offer and product development

Commercial Market (OE + aftermarket)
PRESENT ON BEST SELLING PROGRAMS

60 active programs including 7 in development
(787-10, 737 MAX, A350-1000, H160, KC390, Global 7000, Falcon 8X)

NEW:
A350-1000, 787-10, 737 MAX,
Airbus Helicopters H160, KC390,
Global 7000, Falcon 8X

RECENT:
A350-900, 787-8/9, A380, A320/A321neo, A400M,
Falcon 7X, SSJ100

MATURE:
A320/A321ceo, 737, 777, 747, ATR 42 & 72,
other Bombardier & Falcon programs
Eurofighter / RAFALE / F18 / V22

LEGACY:
A300/310, BAE146, Mirage, Tornado…
DOUBLING CARBON CAPACITY IN THE NEXT 10 YEARS

Carbon tonnage growth 1997-2025

SA 3D carbon
SepCarb III
SepCarb III OR
SepCarb IV
Next Gen Carb

~1,400 AC >100 pax equipped
~2,500 AC >100 pax equipped
~4,500 AC >100 pax equipped
~7,500 AC >100 pax equipped
13,000+ AC >100 pax equipped

x2
WORLDWIDE FOOTPRINT STRATEGICALLY LOCATED TO SERVE CUSTOMERS

IMPROVE CUSTOMER PROXIMITY FOR SUPPORT & SERVICES

GROW LOW COST EXTERNAL SUPPLY CHAIN
From 2010 to 2020: 4% → 20%
Total purchase: x2

ADD CAPACITY ON RECENT LOW COST SITES
Mexico & China plants

AUTOMATION IN WESTERN FACILITIES
2015 vs 2010
20% recurring costs reduction
2020 Further reduction by 20%

2015 vs 2010
Manufacturing lead-times divided by 2
2018 Further reduction by 2

8 Legacy facilities
Europe | USA | Canada

3 facilities in Low cost countries
Mexico | Malaysia | China

8 MRO shops
Mexico | USA | Europe | Singapore

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INVESTING IN OUR FUTURE

State of the art
- Composite structural Landing Gear parts
- Electrical Brakes
- New Carbon SepCarbIV
- REACH Compliant solutions
- Dispatch reliability services

Improvements
Incremental innovation
- Carbon SepCarbIV+
- New advanced materials
- Electrical Ext / Retraction braking & steering
- Health monitoring
- Fully integrated low maintenance landing systems

Breakthrough technologies
- Carbon next generation
- Electric actuation Gen2
- Smart actuator on e-brakes
- E-taxi Gen 2
- New Structural Composite

ATA32 integration Platform for Long Range
New standard Low weight
ATA32 integration Platform for Short/Medium Range
Low cost electrical
ATA32 integration Platform for all aircraft segments
Electrical Nose Landing Gear & Systems
Electrical Green taxiing System

Demonstration Platform for game changer aircraft
Advanced Landing Gear Concept

A unique position on Landing Systems
STRATEGIC ROADMAP IN 3 STEPS

YESTERDAY
- Secure & consolidate our positions and Customer satisfaction
- +
- ++

TODAY
- Improve our overall competitiveness
- Technical – Operational – Commercial
- +
- Innovate
- Improve operating margin by 3 - 4 points in 4 years

TOMORROW
- Be on-board of the next generation aircraft of all major airframers
- +

Revenues

2010
2015
2020+
AIRCRAFT EQUIPMENT ELECTRICAL SYSTEMS

Alain SAURET
CEO, Labinal Power Systems
# THE MORE ELECTRICAL AIRCRAFT

<table>
<thead>
<tr>
<th>Systems</th>
<th>A320ceo</th>
<th>A330ceo</th>
<th>A380 &amp; A350</th>
<th>Boeing 787</th>
<th>Next gen aircraft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deicing</td>
<td>Pneumatic</td>
<td>Pneumatic</td>
<td>Pneumatic</td>
<td>Electricity</td>
<td>Electricity</td>
</tr>
<tr>
<td>Environmental Control System</td>
<td>Pneumatic</td>
<td>Pneumatic</td>
<td>Pneumatic</td>
<td>Electricity</td>
<td>Electricity</td>
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<td>Avionics</td>
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<td>Interior loads</td>
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<tr>
<td>Braking</td>
<td>Hydraulic</td>
<td>Partial electrification</td>
<td>Partial electrification</td>
<td>Hydraulic</td>
<td>Partial electrification</td>
</tr>
<tr>
<td>Flight Control System</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landing Gear, thrust reverser, etc.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

More Electrical Power... is a gradual evolution

- **A330ceo:** 230kW
- **1MW Boeing 787:** 1MW
- **787**
A WORLD LEADER IN ELECTRICAL SYSTEMS

**N°1** worldwide for EWIS* and ventilation systems

**N°2** worldwide for Power Generation & Distribution

14,100 people in 12 countries

€ 1.6 billion revenue

95% civil / 5% military

Boeing + Airbus: 90%

---

**EWIS**

- **SALES**
  - 73% OE
  - 7% Services
  - 20% Engineering

- Supply chain excellence
- Configuration management

---

**POWER GENERATION & DISTRIBUTION**

- **SALES**
  - 55% OE
  - 45% Aftermarket

- Technology
- Maturity in service
- MRO network

---

*EWIS: Electrical Wiring Interconnection Systems*
WELL POSITIONED ACROSS THE FULL ELECTRICAL SYSTEM

A key building block to Safran portfolio

POWER SOURCES
- Engine
- APU
- Battery

Electrical systems (up to 1.5MW)
- RAT
- Generator
- Distribution
- EWIS for power
- Power converter
- Electric fans

LOADS
- Flight controls
- Nacelle
- Landing gear

SAFRAN
Labinal Power Systems

GOODRICH
Electrical Power systems

EATON
Powering Business Worldwide
PDMS

AEROSOURCE

PDMS
WORLD LEADER IN EWIS

- **High volume of production**
  - 3,000 harnesses delivered per day

- **Example: long range programs**
  - 100 - 200 km of wires
  - 10,000 – 15,000 connectors
  - 20,000 – 35,000 interfaces (brackets, clamps…)

- **High customization & flexibility**
  - Mature program: 5-10 modifications per day
  - Program in development: 50-100 modifications per day
  - Configuration Management
  - End to End Process from Engineering to Installation
HIGH COMPETITIVENESS OF EWIS INDUSTRIAL FOOTPRINT

2/3 of the workforce in LCC

USA: 1,800 employees
(2 plants; 1 to close at end 2016)

FRANCE: 1,300 employees
(2 plants)

CHINA: 300 employees
(1 plant)

MEXICO: 4,300 employees
(4 plants)

MOROCCO: 2,100 employees
(2 plants)

NEW COUNTRY
(1 new plant in 2017)
PERFORMANCE AND COMPETITIVENESS

- Best-in-class in EWIS businesses

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2016 target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery (OTD)</td>
<td>98%</td>
<td>99%</td>
</tr>
<tr>
<td>Quality (ppm)</td>
<td>500</td>
<td>100</td>
</tr>
</tbody>
</table>

- Continuous Labor cost saving
  - Efficiency: -2% per year + learning curve
  - LPS² = standardized efficient processes

Excellence in production recognized by customers
PERFORMANCE AND COMPETITIVENESS

Cost Saving on Material

- 260 suppliers
  - 26% single source
  - 34% customer contract flow down
  - 40% open
  - Minimum 3 competitors per commodity
- 26 suppliers make up 80% of spend
- 92% under long term agreement for up to 5 years
  - Price reduction plan
  - Design to cost
INNOVATION & DEVELOPMENT

R&T
- Patents - portfolio of over 1,000
- Major programs focused on More Electric Aircraft

Development
- End of large programs development phase (A350, 787)

Investing in the future
Technical Insertion & Next Generation Aircraft

*PLC: Power Line Communication
Civil Market (OE + aftermarket)

**EWIS (sales)**
LPS Market share 50% → 55%
70% long range, 60% single aisle

**Electrical Systems Market**
Base 100
2015: 100, 2025e: 145

**Power Generation & Distribution (sales)**
LPS Market share 10% → 12%

Benefit from production rates and customer offload
Gain share from market leader
KEY DRIVERS TO IMPROVE FINANCIAL PERFORMANCE

- Innovation & new technologies (VFG, VSCF, Fiber optic, PLC, …)
- Operational excellence & supply chain performance
- Cost savings from footprint consolidation in North America
- Growing aftermarket revenues from maturing installed base of electrical systems
- Market share gains from competition or from customers

Moving along the value chain
Improve operating margin by 3 points over 2016-2018
PART II.
Q&A
PART III.
INNOVATION
TECHNOLOGY POWERING SAFRAN

Stéphane CUEILLE (PhD)
Safran Tech Managing Director
An increased R&T effort directed towards clear business drivers

**Aerospace**
- Environmentally friendly propulsion and critical systems
- Optimized energy systems, more electric and hybrid networks
- Secure embedded systems and data analytics based services

**Defense**
- Armed forces “sensor to shooter” capabilities in a network-centric environment
- Autonomous systems and vehicles for military use

**Security**
- Physical & digital security technologies to secure identities & transactions
- Security of human and goods flows at borders, harbors, airports

**450M€ (+50M€)**
Self-funded R&T in 2016*

**2,300 technologists**

**900 patents filed in 2015**

**350M€**
Safran businesses R&T

**100M€**
New corporate research center
SAFRAN TECH: A TECHNOLOGY BOOSTER

A new Corporate Research Center

400+ Technologists

150+ PhDs

25 nationalities

Headquartered at Paris-Saclay*

New state of the art facilities

Energy & Propulsion Architectures

Electrical Systems

Advanced materials & processes

Numerical modelling

Factory of the future

Image, signal, data processing

Sensors and applications

ECOSYSTEM:

→ Academic research
→ Labs / universities

Preparing today key technologies for the future

* Paris-Saclay is one of the most important research clusters in Europe
3D COMPOSITES
PUSHING FORWARD OUR COMPETITIVE ADVANTAGE

Polymer Matrix Composites

→ 230°C

A KEY TECHNOLOGY
FOR LEAP AND BEYOND

→ 1,100 pounds+
weight saving per engine

Ceramic Matrix Composites

800°C → 1,450°C

Safran flying first civil aviation
certified CMC part on a commercial
Air France flight (A320 aircraft)

→ Reduced weight
(divided by 2 to 4)

→ Reduced cooling

→ Allow higher temperature
**HIGH PRESSURE AND HIGH TEMPERATURE TURBINE TECHNOLOGIES**

**Advanced Turbine Airfoils Research Center**

**BENEFITS:**
- Route to 15% lower specific consumption
- Higher durability

**MATERIAL**
- New generation of super alloy: Improved creep life for high durability

**COOLING**
- Integrated optimized design of cooling circuit: Aerothermal – mechanical casting and machining

**THERMAL BARRIER COATING**
- New generation of thermal barrier coating
- Lower conductivity
- More durability

**INSPECTION**
- Computed tomography system
ADDITIVE MANUFACTURING

Driving cost, agility & performance improvement for aerospace applications & mission critical systems

LIFTING OFF WITH FIRST SUCCESSES

- 25+ Machines
- 700 p. directly involved
- 70 people full time

FIRST CERTIFIED PARTS

ACCELERATING AND SCALING UP

- Material/powders & process maturity
- Productivity & modelling
- Critical parts design & modelling
- Mindset & new design freedom
- Supply-chain development

IN A VERY DEMANDING CERTIFICATION ENVIRONMENT

NOW

2018

2020

MASSIVE USE

- Original equipment
- Spare parts
- Repair
- Services
- Toolings & fast prototyping

Driving cost, agility & performance improvement for aerospace applications & mission critical systems
ADVANCED IMAGE PROCESSING
FROM ACQUISITION TO DECISION

Enhanced 3D perception

Image & video improvement

Deep Machine Learning & Pattern Recognition

Sensor & Data Fusion

A key Safran technology differentiator

DEFENSE SYSTEMS

IDENTITY & SECURITY

DIGITAL FACTORY & SERVICES

Superior performance of optronic payloads

Advanced biometrics and video analytics

Higher productivity
e.g. Inspection time divided by 3 on LEAP composite fan blade
ADVANCED NUMERICAL MODELLING

Mastering complex physics all along products lifecycle

Research

In service

Design

Production

Certification

Crack propagation

Massive high performance computing

Injection

Welding

Heat treatments

Forging

Multiscale modelling

Complex fluid dynamics

Combustion

In service
SMALLER, CHEAPER, SMARTER: MEMS

Smaller size generates wider range of users for inertial navigation systems, incl. dual use

Inertial sensor performance for high-end mission navigation

Miniaturization towards portable, individual geolocation service

Market

Size & Cost

70 mm

30 mm

10 mm

CEASAR Lab

A joint lab working on sensor technologies

SAFRAN

Colibrys

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ADVANCED PROPULSION & ENERGY

Looking Ahead: Equipment Technologies for new Eco-friendly Architectures

Optimized Energy and Power
- More electric equipment
- Multi-source power
- Fuel Cells
- Generator/motor technologies

Ultra-Efficient Propulsion System
- Propulsion-Airframe integration
- Advanced architectures and technologies
- Buried/distributed propulsion
- Hybrid-Electric Power

Electrical network tech.
- Modular Power Electronics
- High voltage technologies
- Health monitoring

First practical step of hybridization

Micro-Hybridization
‘ECO mode’ propulsion concept for helicopter

Year 2035
- CO₂: -60%
- NOₓ: -85%
- dB: -55%

NOₓ, CO₂, dB improvements in Year 2035.
HELI OPTER TURBINE TECHNOLOGY

Bruno EVEN
CEO, Turbomeca
OUR AMBITION, OUR ROADMAP

To be the world’s preferred helicopter engine manufacturer

- Enlarge activity within portfolio
- Innovate and develop new engines and variants including high-power engines
- Strengthen our leading position in growth markets
- Develop customer satisfaction and loyalty
EIS 2016 / 2018
Baseline engine
On-going maturation of new technologies

EIS 2020+
10 to 15% sfc reduction
+20% power-to-mass ratio
Power growth to 3,000 shp
- Cutting edge compressor
- New materials to sustain higher temperatures
- Light high-performance power turbine
- Additive manufacturing

EIS 2025+
25% sfc reduction
Hybridization
2015: proof of concept
2020: first flight

RTM322 (existing)
TS2500 (FETT April 2016)
Tech 3000 demonstrator (FETT 2016)
3,000 shp production engine (2022)
PIONEER IN ADDITIVE MANUFACTURING

→ Well suited to Turbomeca engine
  • Functional integration → complex parts
  • Small size engine → small components
  • Large diversity of product → need for flexibility

→ World’s first serial components (fuel injector nozzle) certified for helicopter engine
  • Selective Laser Melting (SLM)
  • Investment in 3D metal printing machines
  • Support of Safran Tech

→ Focused on high value components
  • Heat resisting alloys
  • Complex parts

→ Boosting competitiveness: industrial processes, maintenance, inventories…

Benefits: cost reduction of 30% and production cycles reduced by 50%
HYBRIDIZATION PROJECTS

➡️ Helicopters require high power level at takeoff, during few minutes…
   • … rest of the time engines are used at low power far from the best efficiency point

➡️ Helicopter missions are highly variable
   • Engine design is currently a compromise

➡️ Hybridization allows to optimize the power available with the mission profiles
   • ECO/sleep mode
   • Ultra-fast reactivation system using an innovative electric power generation system

➡️ Concept for twin engine helicopters
   • Capability to fly on one engine, using the engines at their best efficiency
   • Significant cuts in fuel consumption (~15%)
COMBINING EXPERTISE WITHIN THE GROUP

➔ A “more electric” aircraft research

➔ Hybrid system to rapidly reactivate an engine to its full power
  • High power density super starter
  • Compact and highly reliable power electronics
  • High power density electric storage
  • Smart integration on the helicopter

➔ Key technologies demonstrated in 2015

➔ Combine the expertise and resources of Safran

Safran is ready to address the need for greater performance and reduced environmental footprint of new-generation rotorcraft
SAFRAN’S DIGITAL VISION

Ghislaine DOUKHAN
Executive Vice President, Safran Analytics
SAFRAN’S WORLD: A WORLD OF DATA

Design: Through 3D mock up

Development and Test: More than 700Tb of data recorded

Manufacturing: Thousands of machines generating data to track quality

Operations: Embedded sensors for health monitoring

Support and maintenance: Regular feedback on product behavior

Our products are born digital and generate data throughout their lives
WHAT WILL IT TAKE TO REMAIN A LEADING INDUSTRIAL COMPANY IN THE FUTURE

➡️ Just like yesterday:
- Good products
- Advanced technologies
- Competitiveness
- Customer satisfaction

➡️ But need to go further:
- Understanding our customers and their use of our products better
- Tracking the behavior of our product in real conditions
- Developing customized services answering/anticipating customers needs
- Constantly improving our internal performance
- Being agile

Analytics can help do all this
SAFRAN’S ANSWER: SAFRAN ANALYTICS

➔ Creation on January 1, 2015
➔ One mission: create value for Safran based on Data
➔ Two main axes:
  • Improvement of internal performance
  • Development of new services based on a better understanding of our customers
➔ 60 data experts in 2016:
  • Identifying use cases
  • Collecting and cleaning corresponding data
  • Defining and applying the right algorithms
  • Industrializing the analytic solution
➔ Assets:
  • Data available
  • Capacity to link facts and figures with “physics”
INTERNAL PERFORMANCE IMPROVEMENT

Scrap rate reduction in production: Beyond Lean/6 Sigma actions

MRO shop performance improvement: Shop flow optimization to reduce TAT

360° engine: User friendly view of each engine life in operation to answer customers’ questions
NEW SERVICES

SFC02: Fuel efficiency improvement

BOOST:
Web-based application, highly secured for real time fleet management (Electronic Engine Logbook, Interactive Electronic Technical Publications, Electronic Configuration Manager)

Predictive Maintenance:
On wing maintenance, quick turns
WHAT ELSE?

Extended Entreprise
(data exchange, supplier situation, risk management)

Airplanes, helicopters
(cycles, usages)

Events
(Weather, local events)

Customer Support

Finance

Maintenance & Services

Airlines
(Fleet, fuel consumption)

Geospatial
(location, flightplans)

Test bench

Airlines
(taxiing, safety, passengers)

Manufacturing

Airports

Engineering

Regulations

Social Networks
(customer sentiment, flight experience)

HR

Competition
(situation, strategy)

Logistics

Sales

Extended Entreprise

Massive data sets accessible: let’s imagine new use cases
SAFRAN: A DIGITAL INDUSTRIAL COMPANY

Seizing the potential of data!
PART III.
Q&A
PART IV. FINANCE
FINANCE IN SUPPORT OF STRATEGY

Bernard DELPIT
Group CFO
FINANCE IN SUPPORT OF STRATEGY

- Conservative accounting supporting transparency
- Hedging policy protecting performance
- Disciplined capital allocation sustaining growth
- Financial ambition creating success
CONSERVATIVE ACCOUNTING

**OE**

- **Revenues booked at net contract price**
  - including variable consideration (allowances…)

- **All costs incurred are expensed**
  - No capitalization of negative margins

- **Margins booked at delivery**
  - Upon delivery if positive
  - No later than at delivery if negative

**AFTERMARKET**

- **Revenues booked at net contract price**

- **Timing of revenue recognition depends on type of contracts**
  - “T&M”: at shop visit
  - Long term service agreements (LTSA):
    - ESPH: monthly billings
    - ESPO: fraction as monthly billings and remainder at shop visit

- **Margins**
  - T&M: at the shop visit
  - LTSA: booked progressively
    - Provisions to reflect future maintenance costs based on engine behaviour & contracts requirements

Start up LEAP losses booked in P&L as incurred (2016-2020)
No anticipation of LTSA margins
CONSERVATIVE ACCOUNTING

IFRS 15 PROJECT

- IFRS 15 mandatory from 2018
- 2017 proforma for comparison
- Opening impact on Equity at 01/01/2017
- Implementation guidance yet to be finalized
- Project launched at Safran and ongoing industry discussions
- Key items
  - Identification of performance obligations
  - Timing of transfer of control
  - Opening Balance Sheet

PRELIMINARY ASSESSMENT

- Main areas affected
  - Revenue based on milestones (Defense)
  - Upfront revenues (R&D sales)
  - Per Flight Hour service agreements
- Some classification changes in the P&L
  - Some transactions with customers booked as charges could be instead deducted from revenue (e.g. special warranties, penalties...)

Early stage of analysis and assessment, next update at FY 2016 earnings
CONSERVATIVE ACCOUNTING

Potential impacts of IFRS 15 implementation on current civil engines revenue

<table>
<thead>
<tr>
<th>Services</th>
<th>OE</th>
</tr>
</thead>
<tbody>
<tr>
<td>T&amp;M: Limited potential impact</td>
<td></td>
</tr>
<tr>
<td>ESPH/ESPO: recognition of revenue when costs are incurred (at SV)</td>
<td></td>
</tr>
<tr>
<td>Limited potential impact</td>
<td></td>
</tr>
</tbody>
</table>

Takeaways

- **LEAP: 50-60% of aftermarket on ESPH/ESPO**
  - Accounting under IFRS 15 expected to be close to current T&M revenue recognition

- **Gradual transition for Propulsion**
  - CFM56 aftermarket will remain mostly a T&M business
  - LEAP will represent 20% of CFM fleet in the 2020’s

2020’s: P&L of services will remain dominated by current model
HEDGING

**PRINCIPLES**

- To protect economic performance from €/$ volatility and provide time to adapt cost structure to an adverse FX environment
- To optimize financial benefits of hedging whenever possible without jeopardizing protection
- Translation effect not hedged*
- Transaction effect hedged through the coverage of net exposure to the $
- Mark to Market variations neutralized in adjusted data

*except net investment hedge

**INSTRUMENTS**

- Forward $ sales / Y+3-Y+4
- Accumulators: day after day hedging build up
- Options to increase coverage and/or improve hedged rate
- No views taken on spot rate evolution
- Benefits from long term volumes of net exposure (supported by backlog)
- Risk: loss of opportunities only
HEDGING

Yearly exposure: $7.4bn to $8.0bn

Increasing level of net USD exposure for 2016-19 in line with the growth of businesses with exposed USD revenue

($bn)

2015 2016 2017 2018 2019

2016 & 2017 fully hedged

7.4 7.5 7.7 3.7 5.7

Estimated impact on recurring operating income of target €/$ hedge rates

€/$ Target hedge rate

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>€/hedge rate</td>
<td>1.25</td>
<td>1.24</td>
<td>1.22</td>
<td>1.20</td>
<td>1.20</td>
</tr>
</tbody>
</table>

€250M to €500M of tailwind over 2016-2019e

EBIT impact vs previous year (in €M)

Up to 100M

Up to 500M
HEDGING

Reminder of the €/$ spot and forward rates seen in 2014 and 2015

- 2014 average spot 1.33 (High 1.39, Low 1.21)
- 2015 average spot 1.11 (High 1.21, Low 1.05)
- In 2015, the forward rate for 2018 was on average 1.16 (High 1.25, Low 1.10)
- In 2015, the forward rate for 2019 was on average 1.19 (High 1.28, Low 1.13)

- Target ranges at “1.17-1.20 for 2018” and “1.15-1.20 for 2019” include opportunistic hedges at 1.08 (as communicated in October 2015) and optional strategies at higher rates set up in the course of 2014 which matured at the end of 2015

- Where the achieved hedge rates for 2018 and 2019 will lie in the target ranges will depend on whether the €/$ remains below 1.25 in 2016 and 2017
CAPITAL ALLOCATION

➔ **Technological differentiation through R&D**
  • R&D spending peaked in 2014 and will continue to decline during period of the plan
  • Discipline in sustaining engineering
  • New opportunities to be selected under strict conditions

➔ **Capital Expenditure to support growth**
  • CAPEX peaking in 2016 – stabilization at a lower level going forward
  • New products ramps, production rate increases, international footprint

➔ **Growing cash returns to shareholders**
  • Confirming 40% pay out ratio for dividend distribution going forward

➔ **Acquisitions**
  • In core activities only
  • Under strict conditions of IRR and implicit rating
CAPITAL ALLOCATION

R&D spending

- Sustained R&T for the long term
- Decrease of development spending as programs enter into service
- Self funded R&D trending towards €1bn
- Expensed R&D peaking in 2017

CAPEX spending

- Supporting LEAP ramp up
- Production rate increases (A320, 737, A350, 787)
- Production capacity (carbon)
- Strict investment criteria
- Trending towards 3% of sales by 2020
### 2016-2020 trends

- Growth in cash from operations (CFO*)
- Higher working capital (WC)
- Lower capitalized R&D and CAPEX after 2016

- FCF conversion rate:
  - above 40% in 2016
  - to average 50% over 2016-2020

- More FCF generation offering increased headroom

<table>
<thead>
<tr>
<th>Year</th>
<th>CFO*</th>
<th>WC</th>
<th>R&amp;D** CAPEX</th>
<th>FCF</th>
<th>Net debt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec 31, 2010</td>
<td>10.2</td>
<td>0.1</td>
<td>-6.6</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>Dec 31, 2015</td>
<td>10.0</td>
<td>0.7</td>
<td>-5.7</td>
<td>3.8</td>
<td>-0.7</td>
</tr>
</tbody>
</table>

* Including expensed R&D  ** Capitalized R&D

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**Notation:**
- *CFO* (Cash Flow from Operations)
- WC (Working Capital)
- R&D** (Capitalized R&D)
- CAPEX (Capital Expenditure)
- FCF (Free Cash Flow)
- Dividend paid (2011-2015)
FINANCIAL AMBITION

MAIN ASSUMPTIONS

➤ **Scope**
- 2016 outlook is applicable to the Group’s structure as of December 31, 2015 and does not take into account the impact in 2016 of the finalisation of ASL
- For the 2017-2020 period, ASL is expected to be consolidated using the equity method (50%)

➤ **FX**
- By convention, average spot rate of EUR/USD spot rate of 1.11 in 2016, 1.12 for 2017-2020
- Including benefits of medium-term FX hedging policy

➤ **Accounting**
- Safran’s outlook is based on the Group’s current accounting practices
- No anticipation of IFRS 15 potential impacts

2016-2020 VIEW

➤ **Steady organic revenue growth…**
- Aerospace: OE production ramp-up (narrowbody & widebody, military, helicopters), growth in services
- Defence: executing on contract wins (Rafale, Patroller, Paseo…)
- Security: strong organic growth based on existing contracts and new products

➤ **Providing strong base for progress in profitability**
- Transitory pressure on Propulsion profitability
- Steadily increasing contributions of Aircraft Equipment, Defence and Security
FINANCIAL AMBITION

- Gradual reduction of CFM56 contribution
- Transitory losses on Leap OE
- Break-even on Leap OE production by end of decade

Cost of production:
Learning curve of LEAP

Standard cost of production

- Initial production costs > standard cost of production (double sourcing; volumes)
- Targeting a 40% reduction in production cost by 2020 (double sourcing; learning curve)
Financial Ambition

- Growth in services
- New programs contribution
- Push export sales
- Dual use technologies
- Existing contracts profitability
- New products

Productivity gains and cost control measures across all businesses
FINANCIAL AMBITION

- Temporary headwind from LEAP transition and expensed R&D
- Offsetting factors: growing contribution of civil aftermarket and other businesses
- Tailwind from FX
- Propulsion margin to remain in the mid to high teens during transition
- Group margin consistent with the record set in 2015 during transition and trending above 15% when transition is completed

Indicative profile of Group gross margin

* Starting 2017, excluding the contribution of assets contributed to ASL. For 2017-2020, ASL is expected to be consolidated under the equity method.
2016-2020 AMBITION

Revenue target above €21 billion in 2020

- Assuming average spot rate of USD 1.11 to the Euro in 2016 and 1.12 over 2017-2020

Recurring operating margin trending above 15% in 2020

- Including benefits of medium-term FX hedging policy

EBIT to Free Cash Flow conversion averaging 50% over 2016-2020

- Subject to customary elements of uncertainty on the timing of downpayments and the rhythm of payments by certain state customers
- Future opportunities will be evaluated on their merits and investments decided as appropriate
PART V.
CEO & CFO
Q&A
CLOSING REMARKS
KEY MISSIONS, KEY TECHNOLOGIES, KEY TALENTS