



DUBAI AIRSHOW
CFM INTERNATIONAL
MEDIA BRIEFING

2023

TODAY'S SPEAKERS



Gaël Méheust
President & CEO
CFM International



Jérôme Morhet
Executive Vice President
CFM International



Karl Sheldon
Executive Vice President
CFM International

CFM HAS SURPASSED PRE-PANDEMIC LEVELS



LEAP utilization at 2019 levels

92% days flown ratio

**Cirium, Flightradar24 data*



AIR INDIA record order
for more than 800 LEAP-1A/-1B engines



5+ YEARS OF PRODUCTION

10,000+ LEAP engine backlog

**4Q2023*



40-45% PRODUCTION INCREASE v. 2022

~1,600 planned 2023 LEAP deliveries



LEAP-powered A321XLR
Completes passenger flight test



GLOBAL FLEET

2,900+ LEAP-powered aircraft in service

**September 30, 2023*

FASTEST EVER TO REACH 40 MILLION FLIGHT HOURS



LEAP-1A

EIS AUGUST 2016

+26.2 million

FLIGHT HOURS

+13.6 million

+12.5 million

FLIGHT CYCLES

+5.3 million

89

OPERATORS

73

+10 hours

AVERAGE PER DAY

+10 hours

1,593

AIRCRAFT IN SERVICE

1,321

LEAP-1B
EIS MAY 2017



60%

Total win-rate on A320neo fleet

92%

FLOWN DAYS RATIO*

Sole-source
737 MAX family



*Defined as the percentage of days per year an airplane is flown.

CONTINUED GROWTH IN MIDDLE EAST



Nearly 200 LEAP-powered airplanes in the region with 15 operators



Regional LEAP Operators:

Air Arabia
Arkia
Flyadeal
flydubai
Flynas
Gulf Air
Iraqi Airways
Kuwait Airways
Oman Air
Qatar Airways
SalamAir
Saudia

Nearly 400 CFM LEAP engines currently in backlog in region



A321XLR: LEAP-1A ON BOARD



FIRST FLIGHT: June 15, 2022
LEAP-1A-powered



First passenger test flight October 2023
powered by LEAP engines



34K lbs. thrust rating
offered for the XLR



LEAP powering 2 of 3
flight test aircraft



No LEAP hardware changes
required for XLR

LEAP ENGINE IS DELIVERING ...



RELIABILITY
**Same as CFM56,
the industry standard**



ENGINE OF CHOICE
**Powering the majority of
single-aisle aircraft deliveries**



LIFE CYCLE
MAINTENANCE
COST
**On track to reach
CFM56 levels**



FUEL EFFICIENCY
15% to 20% improvement*



*based on customer input, compared to existing CFM56 fleets

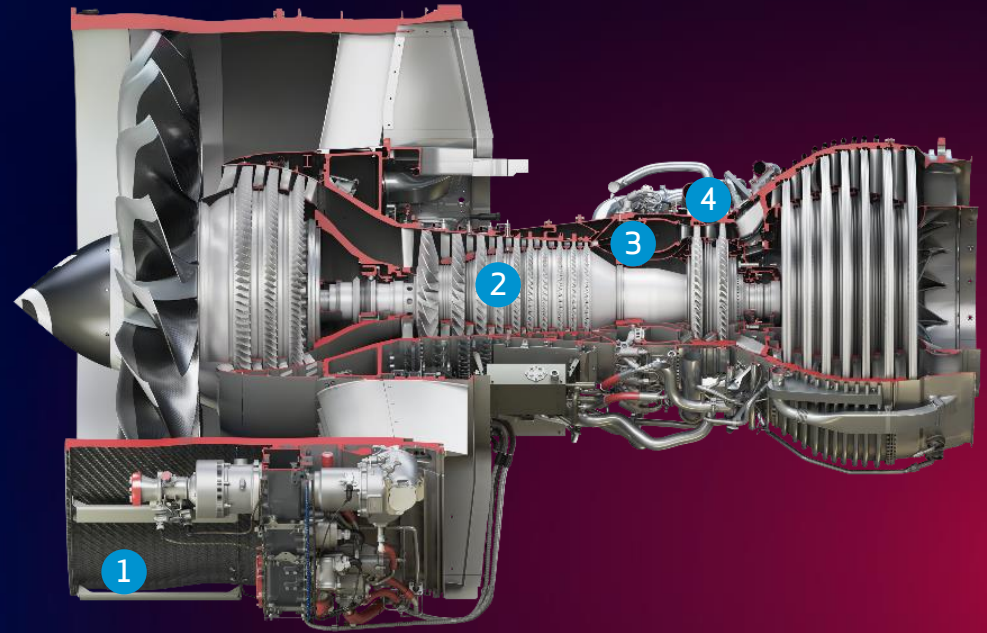


LEAP & CFM56
WORLD'S BEST-SELLING
ENGINES

STABLE DESIGN ...



- 1 LEAP-1A Starter Air Valve reliability
- 2 Non-synchronous vibrations (NSV)
- 3 Fuel nozzle carbon buildup (coking)
- 4 High-pressure turbine blades/nozzles in hot/harsh environments



... RESOLVING DURABILITY ISSUES

INTRODUCING IMPROVED DURABILITY HARDWARE



Reverse Bleed System (RBS)

Addresses fuel nozzle coking by preventing carbon build up

External, retrofittable hardware

Removes residual heat from engine

Reduces airline maintenance burden

HPT Blade & Nozzle Updates

Improved cooling designs

Running thousands of hours of endurance tests

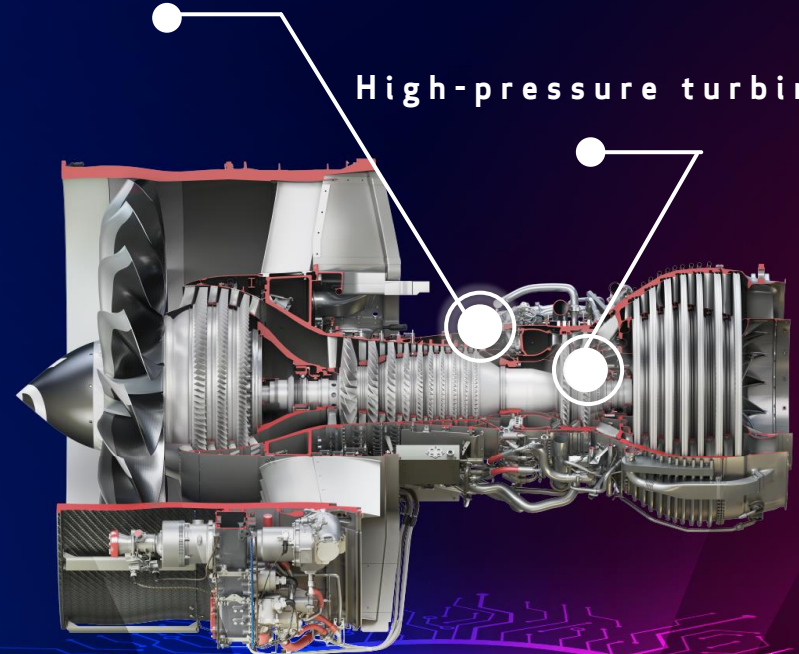
Proprietary dust rig replicates MENA operating environment

Improves durability in hot/harsh environments

Extends time on wing in neutral environments

Fuel Nozzles

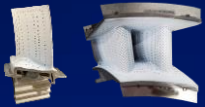
High-pressure turbine



LEAP-1A HOT SECTION DURABILITY IMPROVEMENTS



- Improved blade & nozzle
 - Improve all blade distress modes (new casting)
 - Improve nozzle cooling to reduce stress and meet durability goals



Improved cooling
Improved tip & trail edge design

2023

- Dust endurance testing of improved blade and nozzle design started... target completion by 1Q 2024

2024

- Production introduction of improved blade and nozzle design



Optimized Climb Thrust

- Reduced thrust helps improve HPT blade life
- CFM collaborating with Airbus to optimize climb profile

2024

- Optimized climb thrust... EEC software and rating plug available

Similar updates for LEAP-1B

EXPANDING LEAP OPEN MRO ECOSYSTEM

DEVELOPING INTERNAL & THIRD-PARTY CAPABILITIES



CFM

8 OEM shops for CFM
Services contracts (GE & Safran sites)

CBSA

5 CFM Branded Services Agreements
Air France / KLM, Delta TechOps,
Lufthansa Technik, Standard Aero,
ST Engineering

NON-CBSA

5 Shops already licensed
CEES, MTU Zhuhai, SR Technics,
SSAMC, TAP M&E

Offload partners

6 Supporting internal network

CFM56: THE INDUSTRY STANDARD



ONLY ENGINE TO REACH



1.2 billion
Flight hours

OVER
33,900
ENGINES
Delivered to 600+
operators worldwide



~11,000

CFM56-5B / -7B
Engines have not
seen 1st shop visit

OVER
24,000

CFM56 engines
in service



CFM56

BEST IN CLASS
RELIABILITY

CFM CUSTOMER SUPPORT AS PROVEN AS THE ENGINE



Requests answered
annually from Cincinnati,
Paris and Shanghai
Customer Support Centers

36,000



+60

Customer support
- managers act
as focal point for
CFM support



250

Fields service
engineers

Visits per month
logged by CFM
Customer Web Center

65,000



50

Countries

Phone support

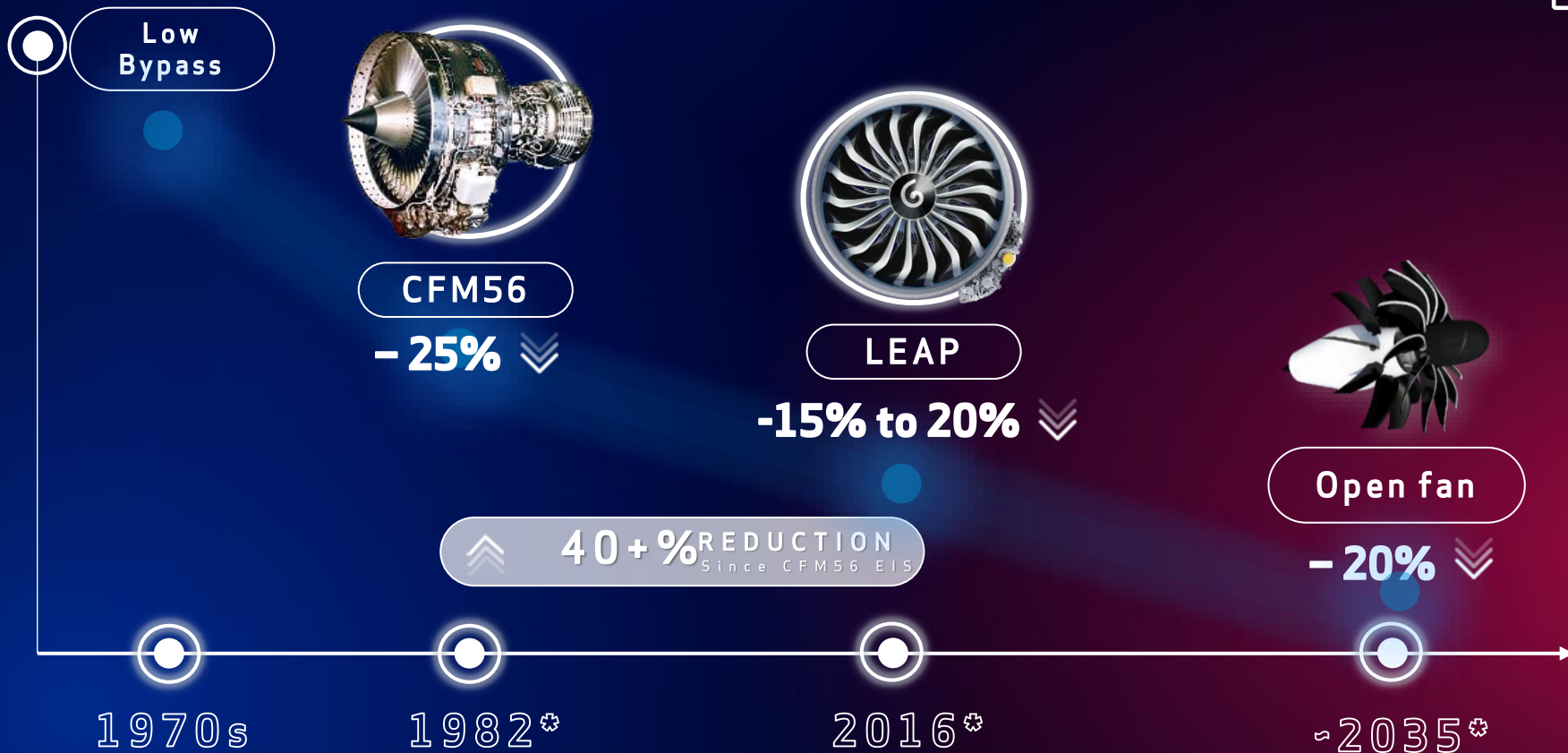
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**RISING TO THE CHALLENGE
OF A SUSTAINABLE FUTURE**

SINGLE LARGEST EFFICIENCY GAIN IN CFM HISTORY



*compared to previous generation engines

CFM RISE BY THE NUMBERS



100%

SAF
COMPATIBILITY

100+

TESTS
COMPLETED

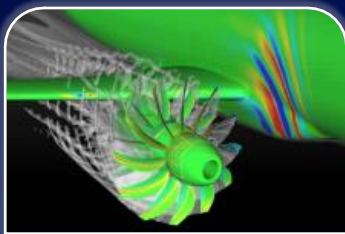
20%

BETTER FUEL
EFFICIENCY

1000+

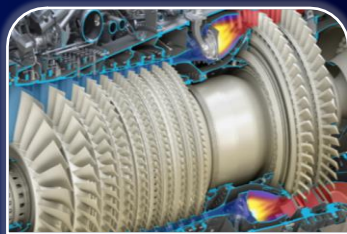
ENGINEERS
WORLDWIDE

CFM RISE ... ON TRACK FOR GROUND AND FLIGHT TESTS MID-DECADE



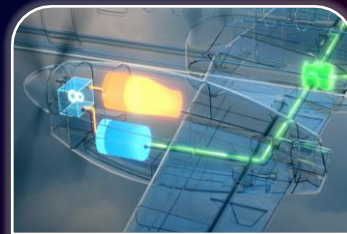
- Next-generation architecture
- Step-change in efficiency vs. ducted fans
- Targeting lower noise level vs current engine

OPEN FAN



- Next-generation compressor technologies & materials
- Increased thermal efficiency
- Higher operating pressure

COMPACT CORE



- Developing MW-class hybrid electric powertrain
- Advancing higher power density / lower weight components
- Decade+ of experience

HYBRID ELECTRIC



- RISE technologies to be 100% SAF certified
- Developing key H2 propulsion building blocks
- Flight test hydrogen-powered engine

ALTERNATIVE FUELS



KEEPING OUR PROMISES...

- LEAP fleet has surpassed pre-pandemic utilization
- Increasing production to meet demand
- Strong market position in MENA
- Delivering LEAP updates to improve durability
- Expanding the LEAP open MRO ecosystem
- Continuing to investment in CFM56 product line
- CFM RISE Program on track for ground & flight tests

... DELIVERING CUSTOMER VALUE





QUESTIONS
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