Alliance 5G industrielle

LA 5G EMBARQUÉE DANS LES AVIONS POUR AMÉLIORER LES OPÉRATIONS AÉROPORTUAIRES ET LA MAINTENANCE

FLYHT AN FTB COMPANY

5G-ENABLED AIRCRAFT OPERATIONS AT AIRPORTS

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MODERN CONNECTIVITY FOR FUTURE FLIGHT OPERATIONS.

THE CONNECTIVITY BOTTLENECK

- **AIRCRAFT TODAY RELY ON:**

“TELEX” VHF DATALINKS (ACARS) — LIMITED BANDWIDTH, CRITICAL FOR SAFETY.

4G / LTE, 3G, 2G — UNEVEN AIRPORT COVERAGE, DECLINING PERFORMANCE.

- **LTE SPECTRUM IS BEING RE-FARMED FOR 5G, REDUCING CAPACITY AND PERFORMANCE.**
- **NON-CRITICAL DATA ALREADY CAUSING VHF CONGESTION, WHICH MUST REMAIN AVAILABLE FOR CPDLC.**

FROM 4G TO 5G — THE NEW FOUNDATION

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Capability	4G / LTE	5G
Latency	40 – 60 ms	5 – 10 ms
Uplink	10 – 50 Mbps	>200+ Mbps
Spectrum	Reducing – refarming to 5G	New spectrum allocations + use of 4G LTE spectrum
Deployment Trend	Sunset beginning	Expanding worldwide
Private Ceullular Use	Rare	Airports & hubs

FUTURE-PROOF ONBOARD CONNECTIVITY

- CERTIFIED 5G AVIONICS CONNECTS TO PRIVATE AIRPORT NETWORKS AND PUBLIC CARRIERS.
- SEAMLESS DIGITAL GATE CONNECTIVITY DURING TURNS FOR OPERATIONS & MAINTENANCE.
- OFFLOADS NON–SAFETY DATA FROM VHF, PRESERVING CPDLC BANDWIDTH.

OPERATIONAL USE CASES

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1. **PREDICTIVE MAINTENANCE OFFLOAD –** UPLOAD MASSIVE SENSOR DATA FOR PREDICTIVE ANALYTICS.
2. **CONNECTED TURNAROUND –** REAL-TIME FUELING, CATERING, AND BAGGAGE UPDATES.
3. **AR/REMOTE MAINTENANCE –** HIGH-RESOLUTION VIDEO STREAMING TO ENGINEERING CENTERS.
4. **FAST SOFTWARE & CONTENT UPDATES –** CABIN MEDIA, CHARTS, AND EFBS UPDATED AT GATE.

OFFLOADING NON-SAFETY DATA FROM VHF

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- NON-CRITICAL MESSAGES CAN NOW TRAVEL VIA 5G NETWORKS, NOT VHF.
- REDUCES CONGESTION AND RISK FOR SAFETY-CRITICAL CPDLC MESSAGES.
- ALIGNS WITH ICAO/SESAR STRATEGY FOR BROADBAND OFFLOAD OF OPERATIONAL DATA.
- EXTENDS LIFE OF VHF NETWORKS

5G-ENABLED AIRCRAFT OPERATIONS AT AIRPORTS

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- HIGH CONCENTRATION OF USERS AT AIRPORTS PRESENTS A CHALLENGE BUT NOT FOR 5G
- 5G IS DESIGNED TO DELIVER HIGH PERFORMANCE TO A HIGH CONCENTRATION OF USERS
- PRIVATE 5G NETWORKS PROVIDE SECURE, HIGH-CAPACITY COVERAGE ACROSS RAMPS AND GATES.
- AIRCRAFT CONNECT USING PKI-BASED CREDENTIALS.

IMPLEMENTATION PATH

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1. **INITIAL IMPLEMENTATIONS –** NORTH AMERICA, EUROPE & ASIA PACIFIC OPERATION.

2. **WORKFLOW INTEGRATION –** CONNECT MRO, EFB, AND MCC SYSTEMS.

3. **FLEET EXPANSION –** RETROFIT OR LINE-FIT 5G AVIONICS.

EARLY ADOPTION RATIONALE & OPPORTUNITIES

- TRANSITION EXISTING OPERATION PAIN POINTS SOLVED BY 4G TO 5G
  - OPERATIONAL SAFETY
  - HEALTH MANAGEMENT
  - PREDICTIVE MAINTENANCE
- TOTAL COST OF OWNERSHIP (TCO) FOR CELLULAR AVIONICS CAN EXCEED $100,000 PER AIRCRAFT
- AVIONICS LIFE CYCLE CONSIDERATIONS:
  - 5G ADOPTION NOW AVOIDS FUTURE UPGRADE COST & REDUCES TCO
  - PROVIDES READY CAPACITY FOR GROWING DATA NEEDS

FUTURE POTENTIAL: IN-FLIGHT CONNECTIVITY

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- IN-FLIGHT 5G e.g. SKYFIVE, STARLINK FOCUSED ON PASSENGER CONNECTIVITY, NOT OPERATIONS OR AIRCRAFT SYSTEMS.
- CAREFUL INTEGRATION REQUIRED FOR OPERATIONAL USE CASES.
- NON TERRESTRIAL 5G MAY HAVE REDUCED CAPACITY OVER DENSELY POPULATED AREAS.
- IN-FLIGHT 5G OPENS THE DOOR TO:
  - GLOBAL INFLIGHT SENSOR DATA ACCESS FOR MAINTENANCE
  - REAL-TIME TRANSMISSION OF AIRCRAFT FLIGHT RECORDER DATA
  - REAL-TIME CONNECTIVITY FOR CREW

AIRBORNE 5G FOR OPERATIONS IS THE NEXT STEP — TODAY WE OPTIMIZE TO LEVERAGE HIGH DATA CAPACITY AT AIRPORTS FOR AIRLINE OPERATIONS AND MAINTENANCE.

AVIATION FUTURE VISION

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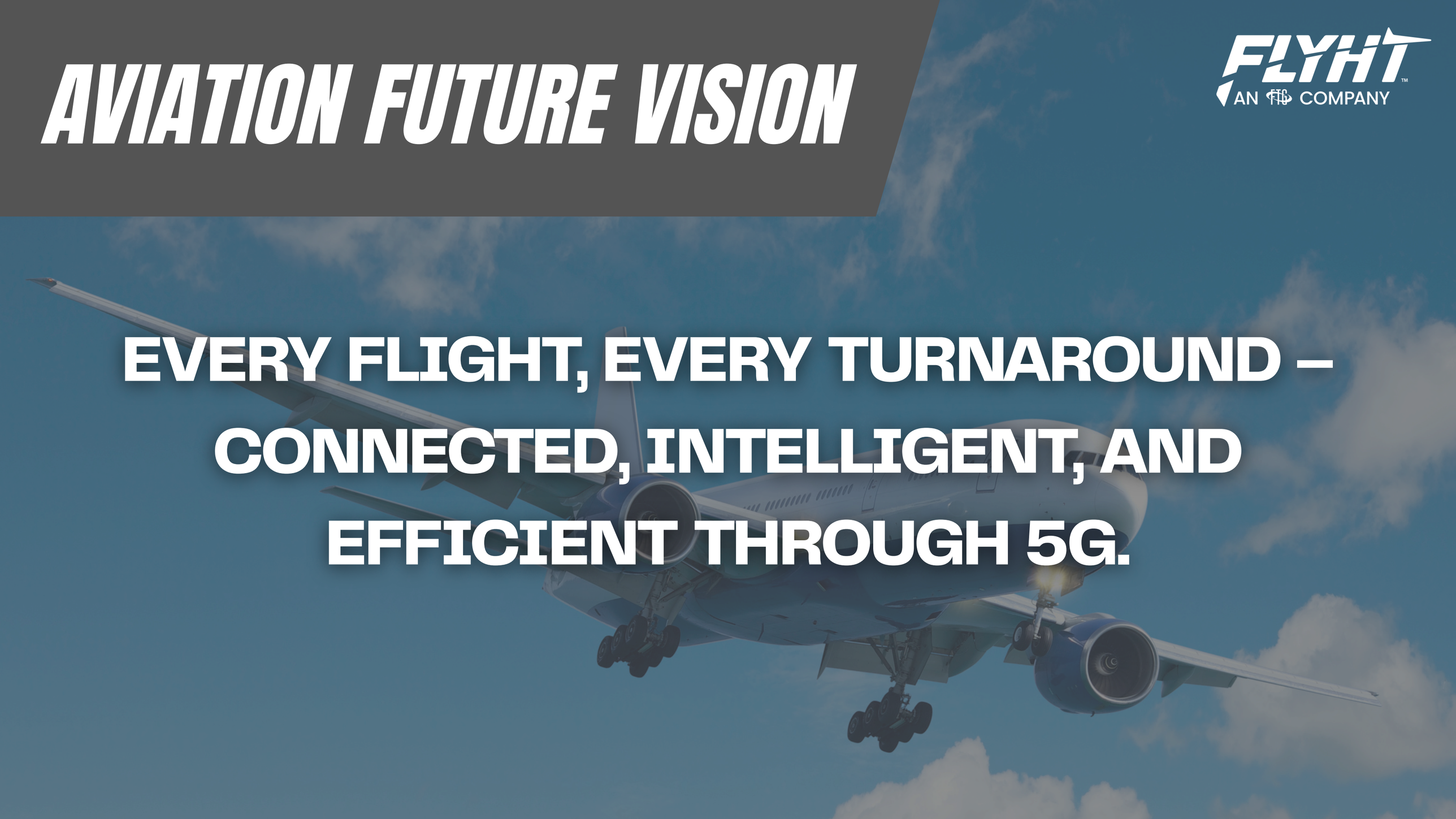

EVERY FLIGHT, EVERY TURNAROUND – CONNECTED, INTELLIGENT, AND EFFICIENT THROUGH 5G.

THANK YOU

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