A SHM- Damage Monitoring Roadmap & Applications

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Airframe Structural Health Monitoring (A-SHM) - Context

Voice of Customer !

- Optimization of fleet operation
- Reduce down time
- Maintenance cost reduction

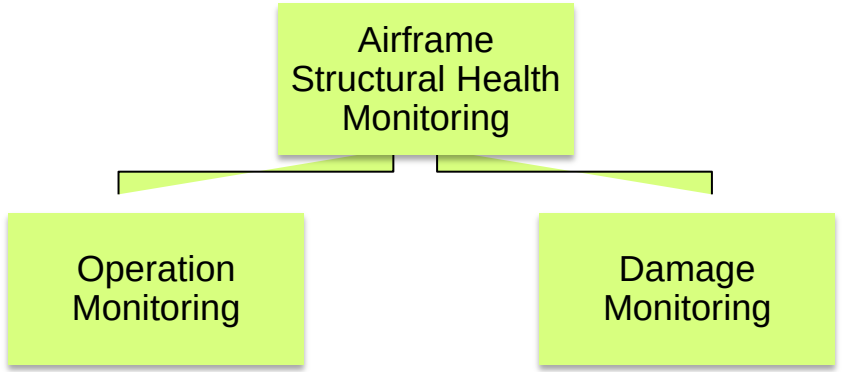
Concerned Maintenance tasks :

- Planned
- Unplanned

AIRBUS Solutions :

Full Digital Aircraft

2018 Quick Wins
… 2027 target:
Condition based Maintenance



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A-SHM Roadmap

2018-19
Tailored Maintenance and damage monitoring

2017
Architecture for optimized A/C operation

2020-22
Integrated ASHM (Usage/damage/Hotspot monitoring) **solution for Derivatives & incremental developments**

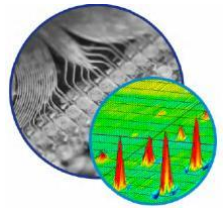
2027-28
Conditioned Based maintenance

2030
Game changer with full Conditioned Based maintenance

De-risk

De-risk

Take benefit of evolution in sensors (lighter, cheaper)



Vision

Game changing for Condition based maintenance

Automatic damage detection
→ Higher Aircraft availability
→Maintenance hours saving for Airlines

Lighter structure design

Value Drivers

- Increase A/C operational availability
- Decrease direct maintenance costs
- Weight saving

Incremental approach to reach long-term ambitious goals !

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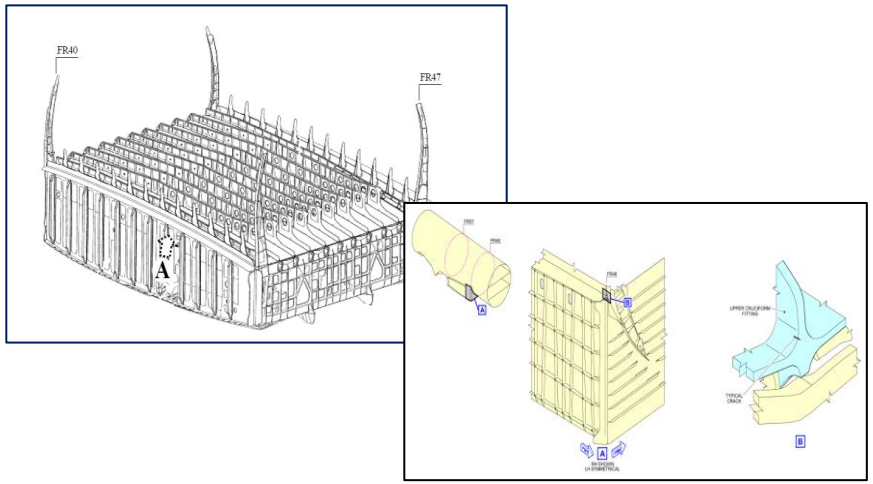
A-SHM DM – Field of applications – **Drivers**

1st driver : The use case

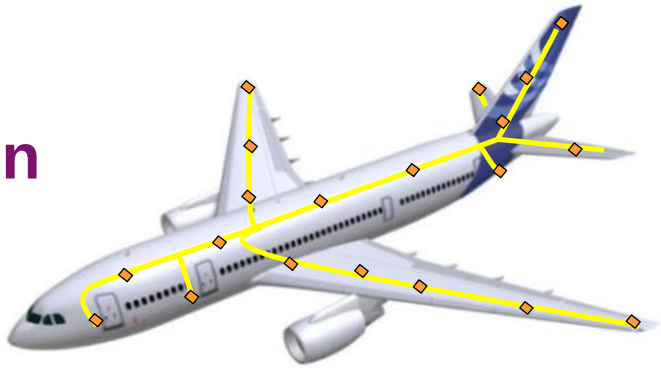


Determining :

Damages characterization

& Environmental conditions

Other drivers : Robustness – Business Case - Certification - Retrofit ability - Digitalization & Self Sustaining



Questioned on demand & on ground - Durability for 10 to 20 years !

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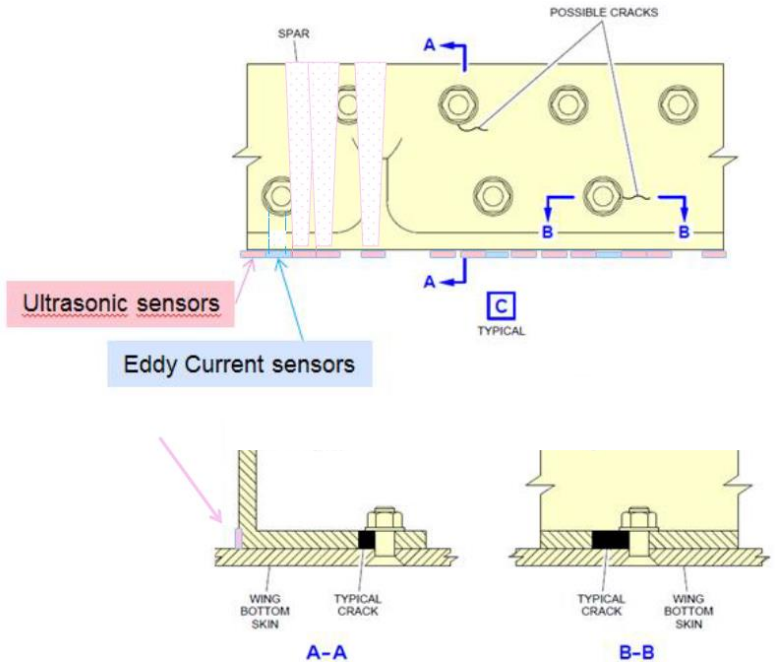
A-SHM DM Application- Metalic structure- All crack directions



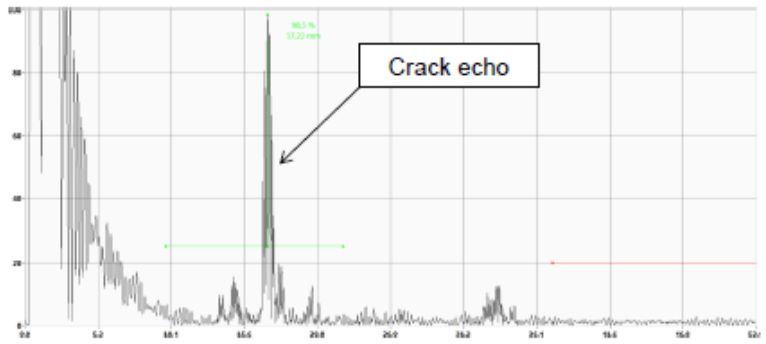
Solution offers retrofit ability !

1st generation:

All crack direction detection with

- **Ultrasonic (UT) sensors** for parallel to surface cracks
- **Eddy current (ET) sensors** for perpendicular to surface

UT result



6 mm crack is detected

UT and ET sensors TRL6 by end 2018 - Qualification program by end 2019

A-SHM DM Application- Candidate selection criteria

Maintenance ***Ideal candidates*** to benefit from SHM solution:

-Low repeat interval (not aligned with maintenance checks)

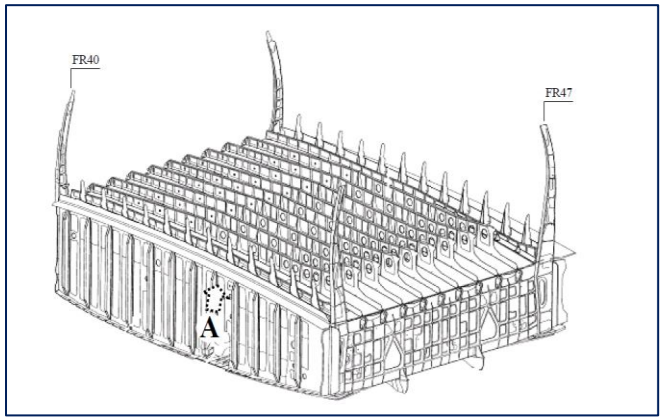
-Heavy access

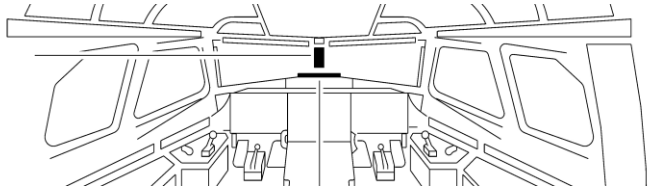
-Risk of collateral damage during access

-Low risk of in service finding

-Long and/or complex inspection

-Rather localized damage scenario that can be addressed with current SHM capabilities





Short term applications driven by business case

THANK YOU

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