SWEDEMO Project overview

Nästa generations strukturer, system, integrerade sensorer och ATM-teknik för den civila flygmarknaden

Next Generation Structures, System, Integrated Sensors and ATM technologies for Commercial Aviation Market

Innovair 2019-10-02

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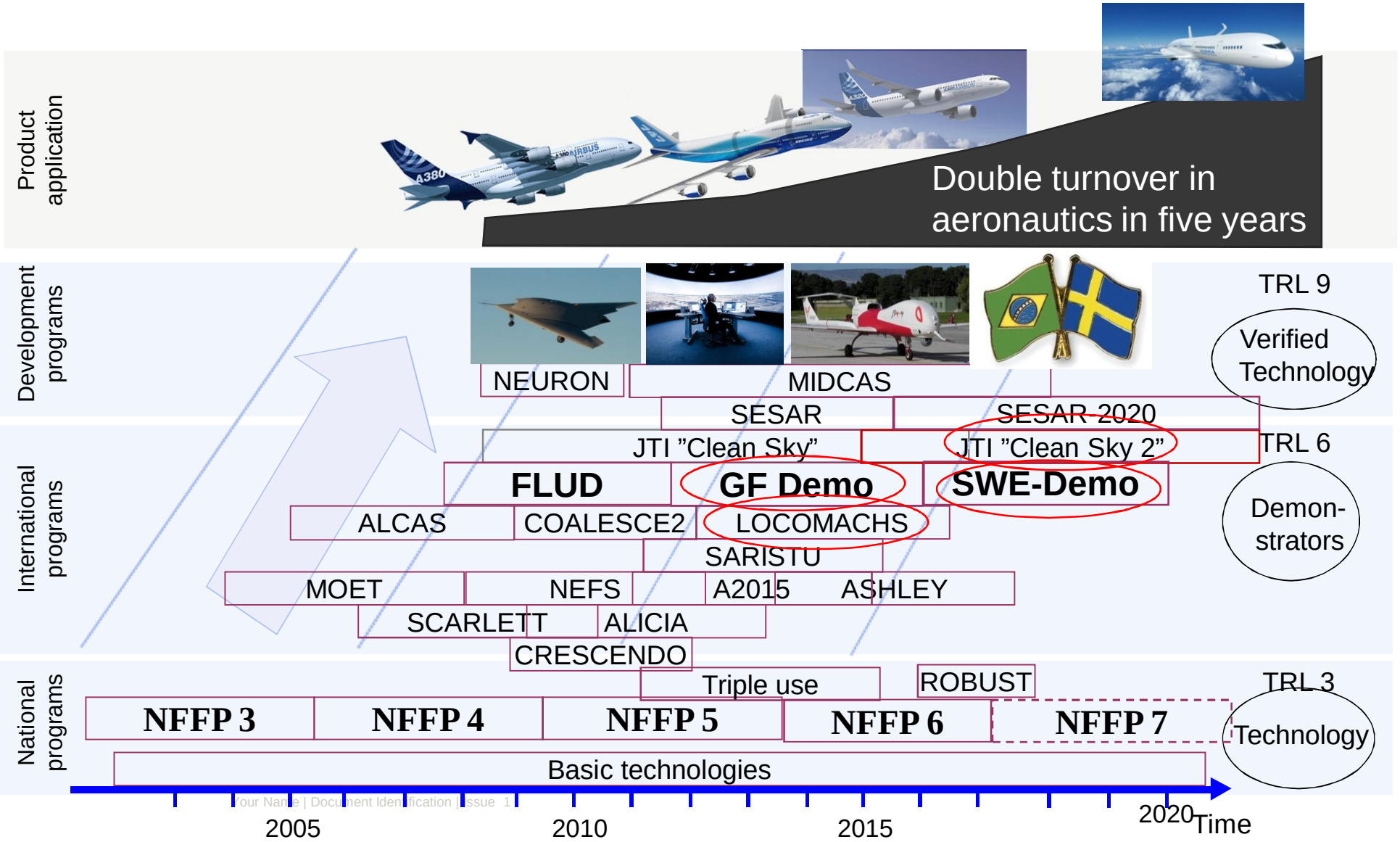
Director Business Development R&T

SWE DEMO – Partners

SAAB GROUP – Research Project overview

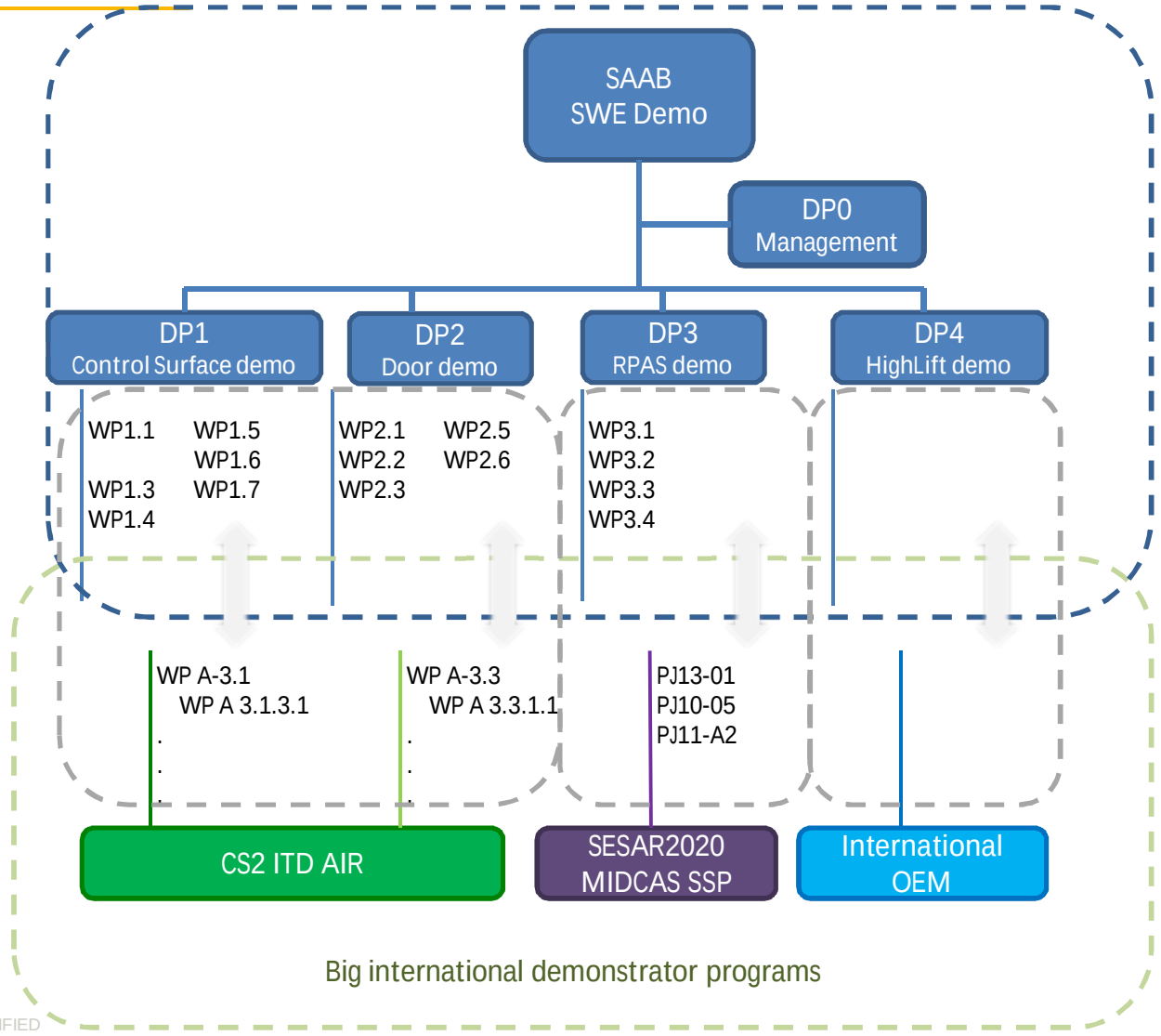


SWE DEMO AREAS & Organisation

DP1&2
- Basic aeronautical technologies and overall capability
- Advanced structure and manufacturing of aircraft structures

DP3
- Air traffic management (ATM)

DP4
- Intelligent onboard systems



SUB PROJECT 1 – Composite Technologies

WP1.1 Innovative tooling

SAAB · KTH · elitkomposit

WP1.3 Automation

SAAB · COMPRASER LABS · KTH · LINKÖPINGS UNIVERSITET

WP1.4 Methods for Residual stress analysis

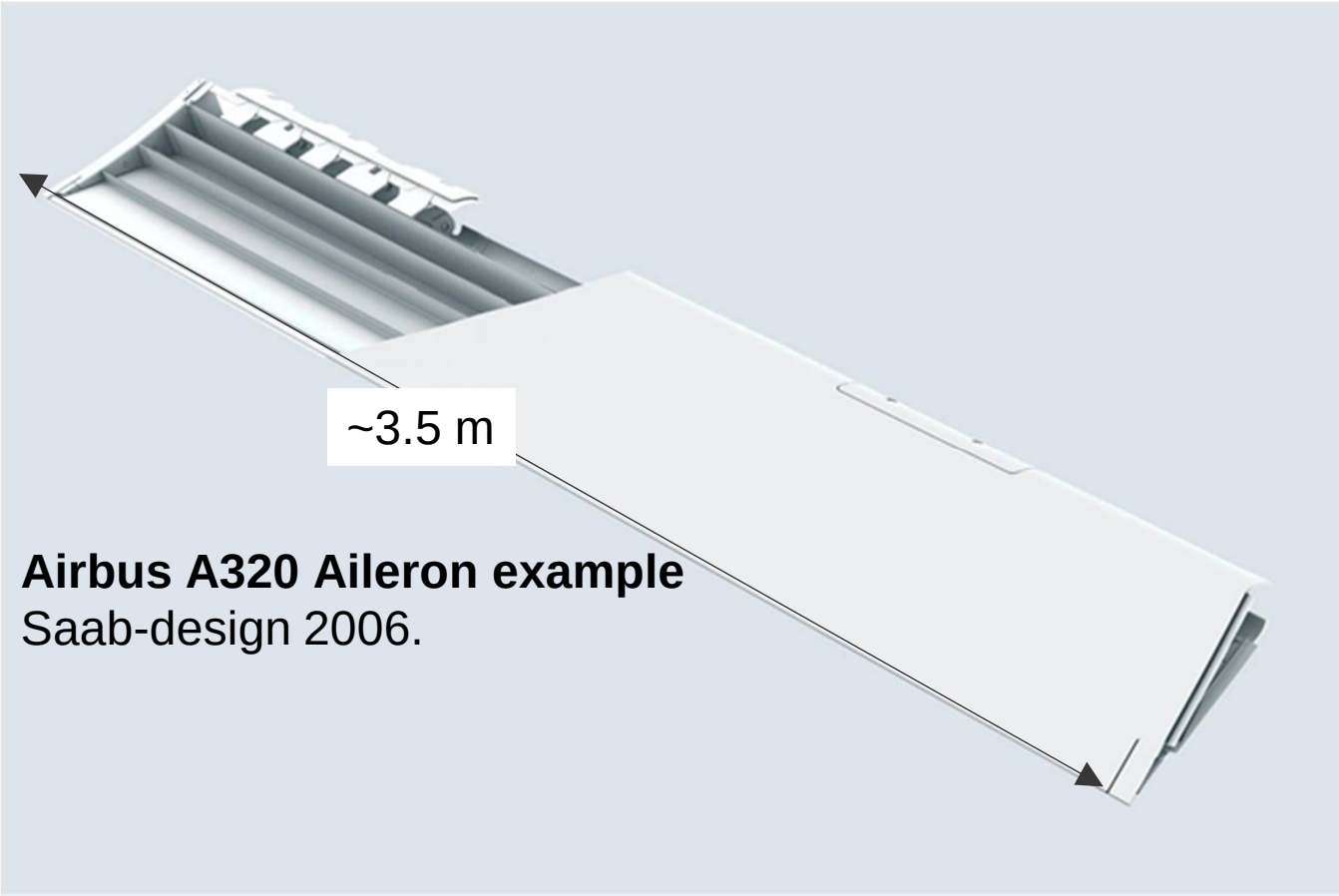
SAAB · KTH · RI.SE

WP1.5 High Temperature composite

SAAB · RI.SE · CREO DYNAMICS

WP1.6 Air flow control technologies

SAAB · KTH



Airbus A320 Aileron example
Saab-design 2006.

SAAB TECHNOLOGIES

SUB PROJECT 1 – Progress

WP 1.1 Innovative tooling

Final report regarding how male & female tools can be combined to compensate for the manufacturing process

WP 1.3 Automation

Automated forming of composites by using a forced controlled robot.

WP 1.4 Methods for Residual stress analysis

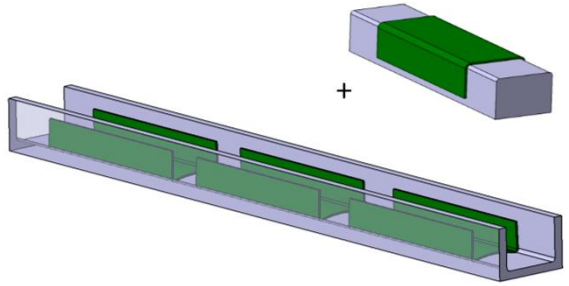
Spring back parameters have been defined. Tests regarding thickness and wetness and their effect on spring back have been carried out.

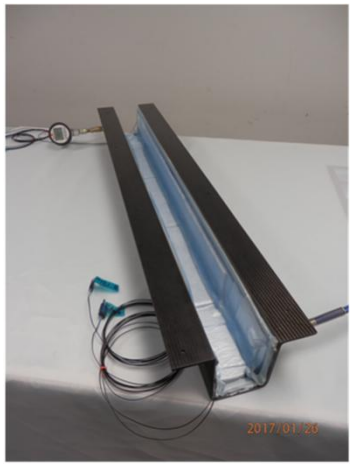
WP1.5 High Temperature composite

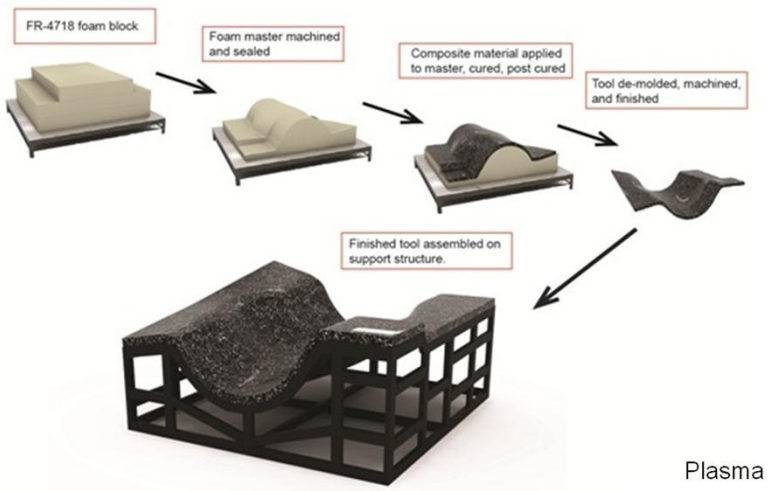
Tools made of different High Temperature composites have been temperature cycled to verify dimension stability.

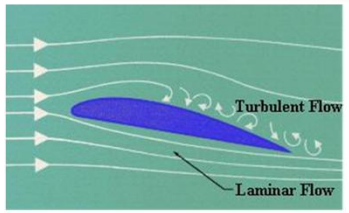
WP1.6 Air flow control technologies

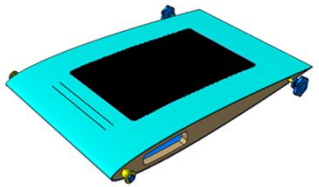
Wind tunnel test with active plasma.



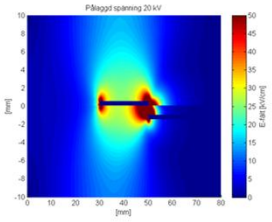








Plasma modeller



SUB PROJECT 2 – Metal Door technologies

WP2.1 Automated Sealant technologies

CHALMERS · LINKÖPING UNIVERSITY · FRAUNHOFER CHALMERS RESEARCH CENTRE FOR INDUSTRIAL MATHEMATICS · SAAB · Atlas Copco · RI.SE

WP2.2 Jig pickups in composite

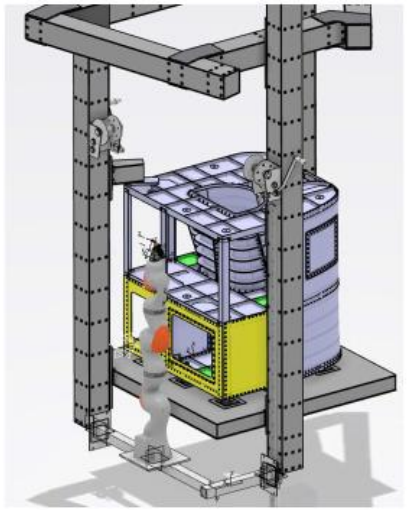
SAAB · Composite Service Europe AB

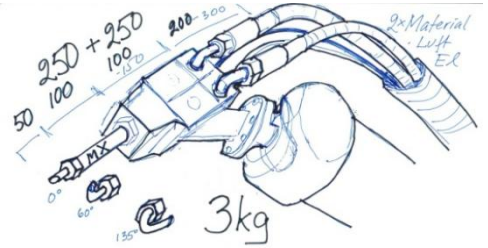
WP2.3 Electrically driven pickups

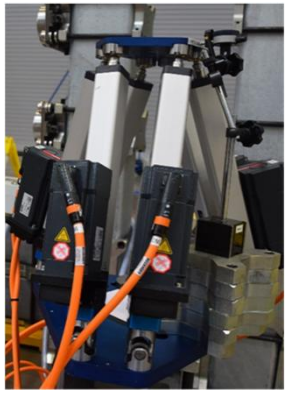
SAAB · CHALMERS · Prodtex

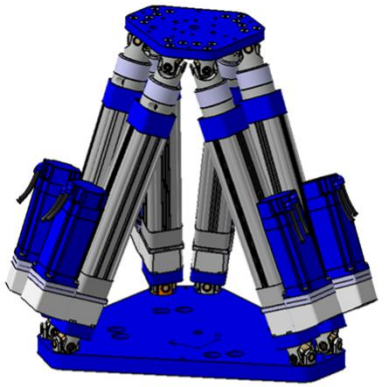
WP2.5 Repair technologies for highly integrated metal parts

SAAB · LINKÖPING UNIVERSITY









SAAB

SUB PROJECT 2 – Progress

WP2.1 Automated Sealant technologies

Demonstration of automated brush seal application with UR10 robot

WP2.2 Jig pickups in composite

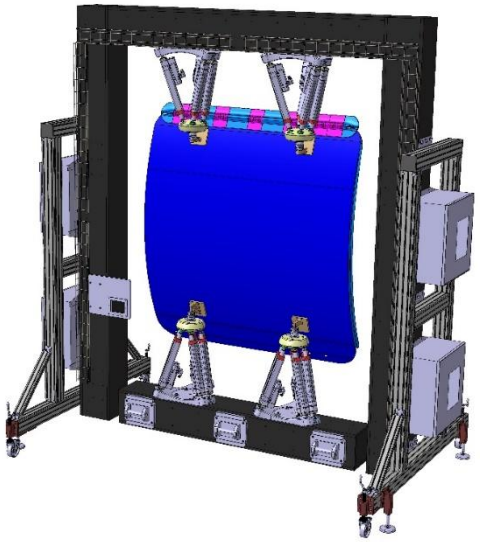
Jig structure which will be manufactured and demonstrated in the Clean Sky 2 project

WP2.3 Electrically driven pickups

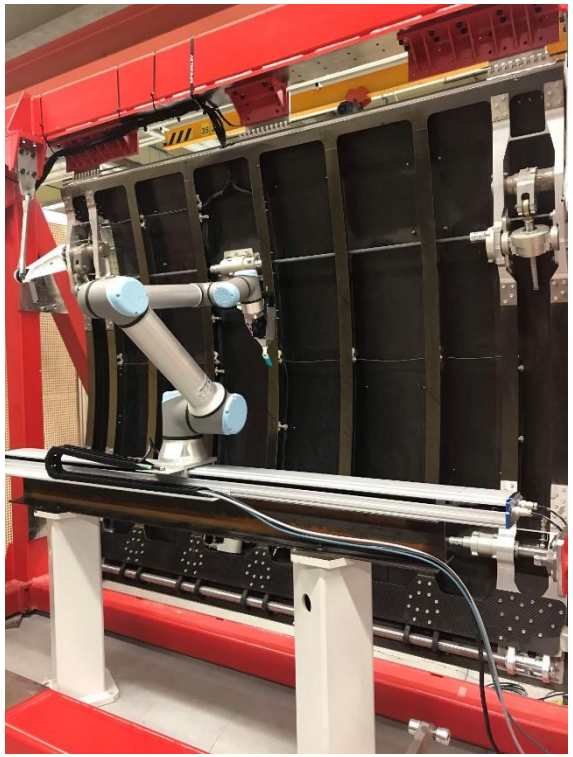
To be demonstrated on 2019-11-26 and the Clean Sky 2 jig will be manufactured with 4 electrically driven hexapods

WP2.5 Repair technologies for highly integrated metal parts

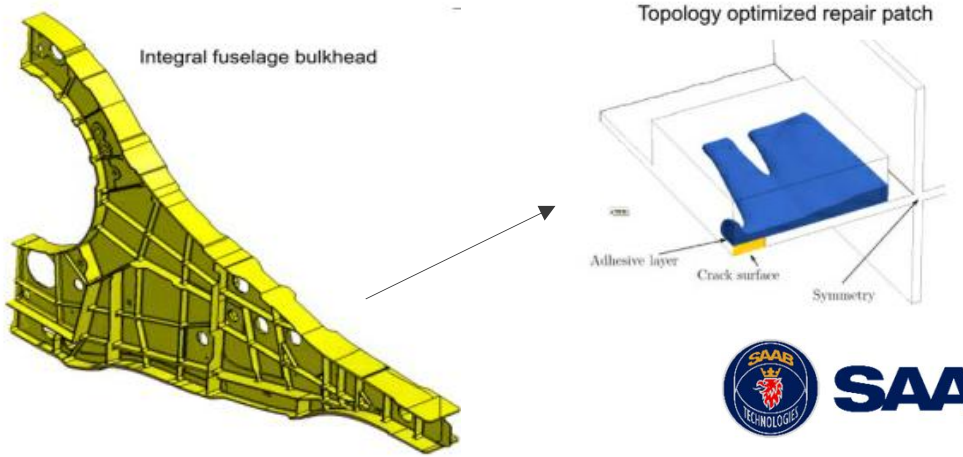
Repair patch will be manufactured and then assembled to a structural demonstrator manufactured in Clean Sky 2



Composite Frame, electrically driven hexapods



Demonstration of automated brush seal application

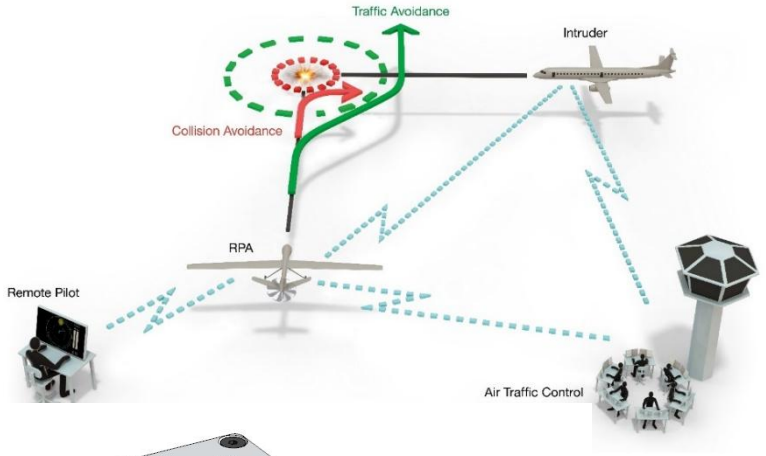


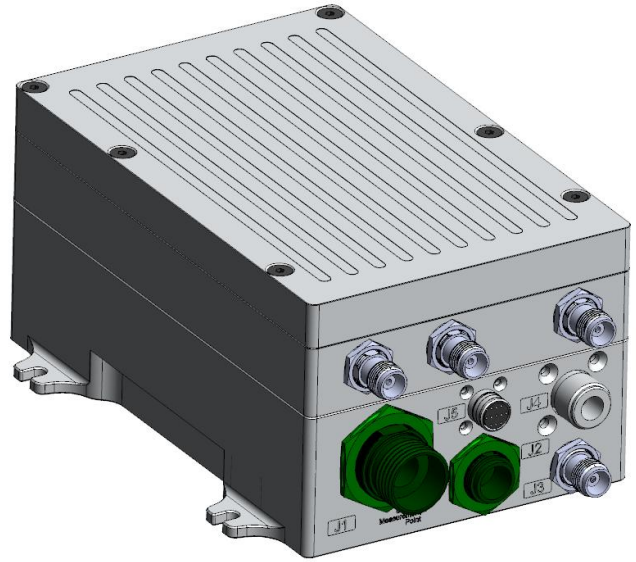
SUB PROJECT 3 – RPAS Integration, Detect and avoid

WP3.1 Technology development

WP3.2 Demonstration

WP3.3 Concept of Operation and regulatory aspects



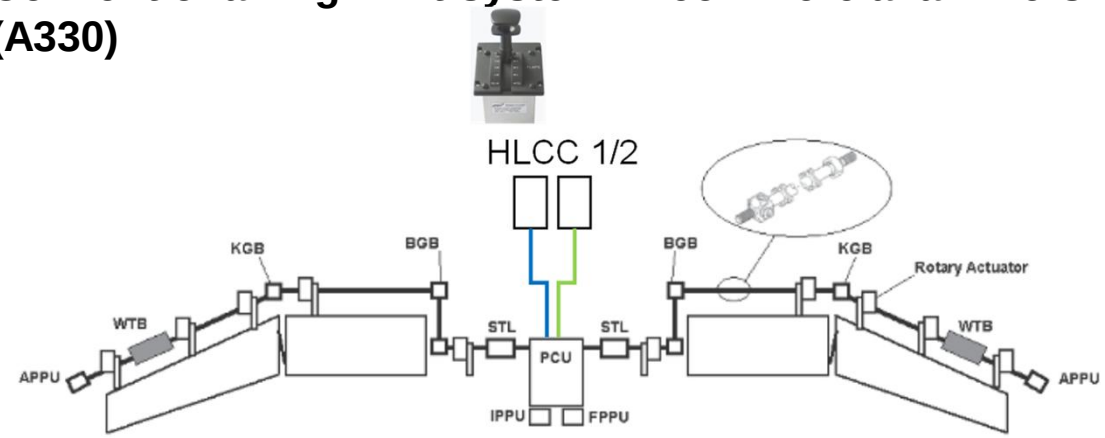


SUB PROJECT 3 – Progress

- Tracking and Fusion algorithms adapted for Detect and Avoid application and integrated with Collision Avoidance algorithms
- A Remain Well Clear function has been developed and tested in simulations
- Simulations performed at LFV's Sturup ATC-simulator to demonstrate that RPAS equipped with DAA system can detect and avoid other aircraft in a safe way
- R5DAA hardware prototype developed and tested in rig environment
- R5DAA integrated on Skeldar together with a DAA radar
- Initial flight tests have been performed to test the R5DAA system on Skeldar. Further tests planned late 2019.

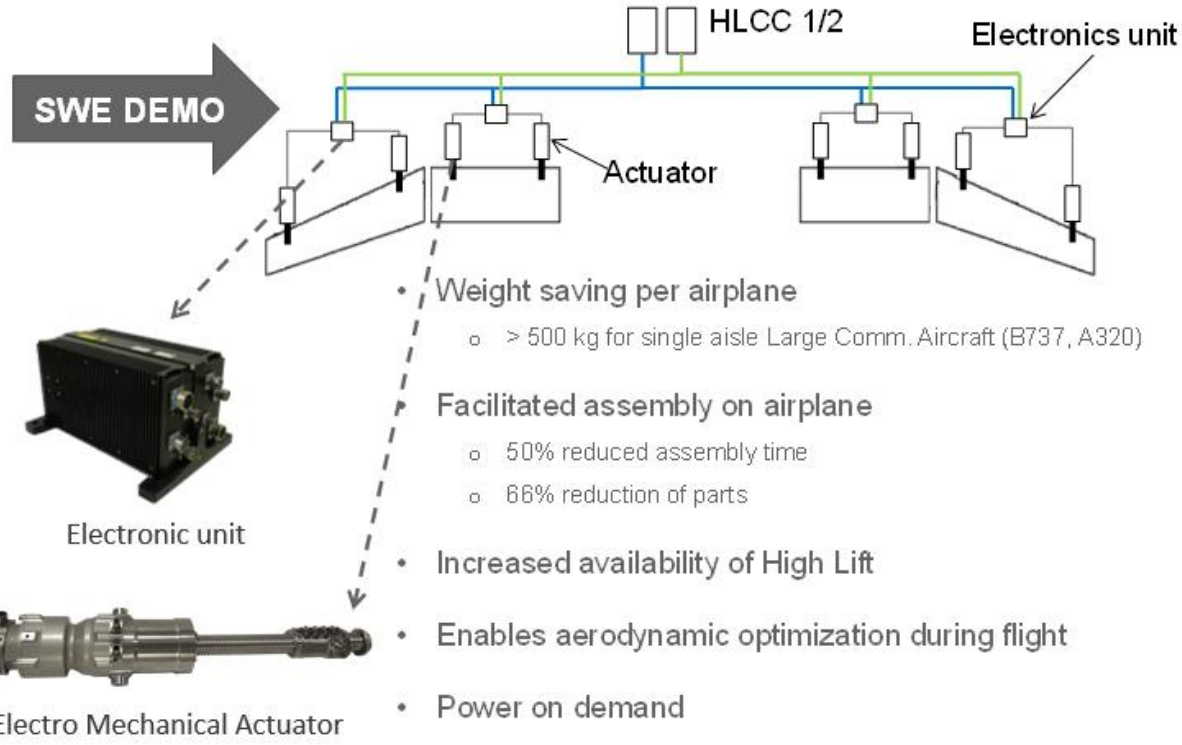
SUB PROJECT 4 – high lift system

Conventional High Lift-system in commercial airliners (A330)



- Complex and heavy mechanical design
- Heavy hydraulic infrastructure required
- Mechanical single failure cause loss of High Lift
- Maintenance demanding
- Environmentally hazardous hydraulic oil

Electric and distributed High Lift-system



- Weight saving per airplane
  - > 500 kg for single aisle Large Comm. Aircraft (B737, A320)
- Facilitated assembly on airplane
  - 50% reduced assembly time
  - 66% reduction of parts
- Increased availability of High Lift
- Enables aerodynamic optimization during flight
- Power on demand

SUB PROJECT 4 – Progress

- First Electro Mechanical Actuators and Electronic units are built.
- System test rig completed and integrated.
- REP (Reliability Enhancement Program) testing
- HALT (Highly Accelerated Life Test) test next to be performed on electronic unit

Electro Mechanical Actuator & Electronic unit

REP test setup.

Temp. chamber, rigged with 8 test boards

System test rig

Test rig connects to Electronic unit.
And Electronic unit to Actuator

Thank you!/Tack!