



Rolls-Royce

# NDTECH Framework 7 proposal

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# NDTECH

## Aim

- Drive forward NDT methods for use on aircraft and engines
- Agree and perform a common method of capability assessment (POD)
- Create a platform of NDT technology developers, SME's and OEM's from which a flow of technology improvements will continue.
  - OEM's & users define the requirements
  - RTO's perform focused research/development
  - SME's are the market place suppliers allowing the OEM's to use the technology

# Current consortium

<b>Avio Group</b>	<b>Airbus (Fr, Sp, G, UK)</b>
<b>MTU AE</b>	<b>Alenia</b>
<b>Rolls-Royce (Cord)</b>	<b>Augusta</b>
<b>SNECMA</b>	<b>Dassault Aviation</b>
<b>Turbomeca</b>	<b>EADS (Fr, G &amp; MAS)</b>
<b>Volvo Aero</b>	<b>Messier-Dowty</b>
<b>WSKRZ</b>	<b>Eurocopter (Fr &amp; G)</b>
<b>+ TWI and CEA (managing the bid submission)</b>	

Estimated total project spend of €25 – 28m

# NDTECH Structure

## ● Work packages A to M have been defined

- WP-A: Design & procure samples, OEM's define defect size requirements
- WP-B to E: UT, EM, RT, Laser UT, FPI, Thermog + Others
- WP F: Reliability via robotics and automation + Human Factors
- WP G & I: Modelling of parts, processes and methods
- WP H & J: Real and simulated POD
- WP K & M: Validation, qualification and training. Plan is to have an aircraft and engines made available to a Validation Centre to perform realistic validations.
- WP L: Long term stability of methods
- WP N: EU and International standards

# Materials and structures

- **The main emphasis will be to establish NDT methods to be applied to:**
  - Life extension
  - Composite materials
  - NDT of large areas at high speed
  - Making methods now in Labs available to manuf. or overhaul facilities
- **To insure future NDT inspections are designed reliably, the project will develop**
  - Realistic Inspection simulations
  - Easy to use reliability measures

# NDTECH Examples of target developments

## ● Phased array UT

- In-situ for aero engines
  - 2D arrays with small element size.  $>500\mu\text{m}$
  - 128 or 256 elements
  - Cabling through 8mm access holes
  - Reliable crack detection and sizing
- Metal billet inspection
  - High sensitivity # 0.5 to 1 fbh
  - High repeatability to  $\pm 3\text{dB}$
  - Extensive Industrial trial to be undertaken
- Large area scanning with multidirectional UT beams

# NDTECH Examples of development plan

## Electro-Magnetic Methods, target problems

- High sensitivity 90/95 POD for crack length of 375 $\mu$ m
- High spatial resolution
- Coverage of complex shapes
- Fretted surfaces
- Coated surfaces
- EM methods for composite materials
- Rapid area scanning
- Machining damage
- Residual stress/strain
- Composite materials

# NDTECH

- **Other ambitious work plans are being drawn up for the remaining NDT methods**
- **Timetable**
  - **Work plan agreement 7<sup>th</sup> Feb**
  - **Discussion with RTO's & SME's – Feb**
  - **Work plan completion 10<sup>th</sup> April**
  - **Submission 20<sup>th</sup> April**