



SAGE

Call #11 Call for Proposal Info Day

Brussels, 19 January 2012

Name of presenter

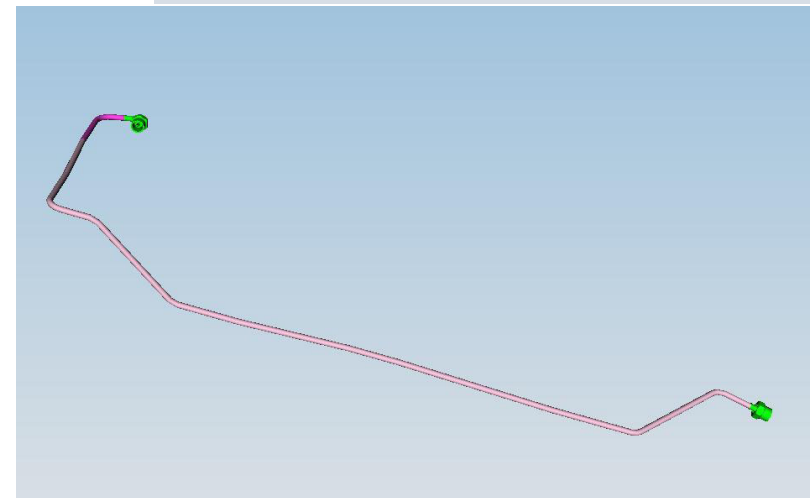
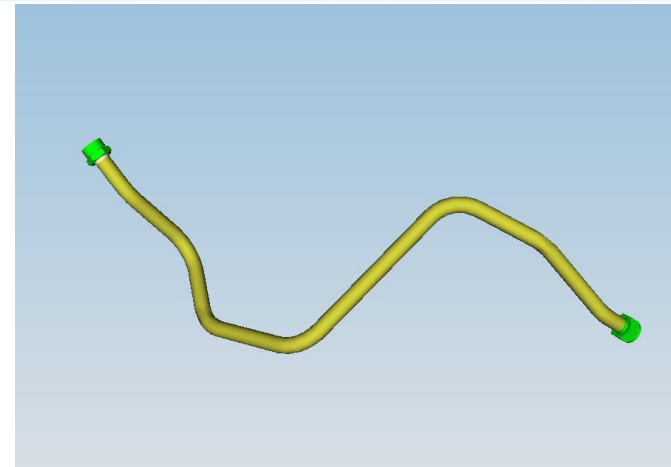
Job title

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Background of Research Topic

❖ Non-Metallic Pipework

- ▶ Current typical engine dressings feature over 300 variants of metallic rigid pipes. In all cases traditional metallic end fittings, mountings and brackets are utilised
- ▶ With no alternative available, the current system introduces significant weight to the engine especially as engine technology progresses and more systems are introduced - the need for more complex 3D and reliable fluid transfers exist
- ▶ RTD activities are therefore required to investigate and develop a non-metallic fluid transfer and support system to replace traditional metallic variants (typical examples seen here)



Research Topic Objectives

- The key objective of this topic is to deliver an alternative fluid transfer system to replace traditional metallic pipe designs, which includes replacement of the current clipping/tube mounting and end fitting requirements
- The objective of the work package is to develop the new technology and demonstrate it to Technology Readiness Level (TRL)6
- To meet the above key objective the partner shall work with Rolls-Royce to develop the non-metallic system with careful consideration of the following key requirements:
 - Porosity
 - Pressures
 - Temperature and temperature gradient
 - Material damage tolerance – mechanical, chemical and environmental
- In addition to the technical requirements the following should also be considered:
 - Pipe and assembly inspection technique
 - Joining and assembly of tube end fittings
 - Automated/high volume manufacture

Expected outcome

- Design study
 - Trade study of existing non-metallic fluid transfer systems
 - Review of state of the art non-metallic pipe design
 - Deliverable from Trade study will give conceptual design for new fluid transfer system
 - Trades study of materials and methods of manufacture
 - Numerical Stress analysis (FEA) of conceptual system, both mechanical and thermal methods utilised
- Manufacturing trials
 - Manufacturing trials of conceptual design
 - Develop method of manufacture
 - Demonstrate NDI/NDT methods for conceptual design
- Design Validation
 - Validation testing of new non-metallic system (rig testing and, if appropriate, engine test)