COPERNIC

COst & PERformaNces Improvement for Cgh2 composite tanks

CALL TOPIC	Compressed hydrogen on-board storage (CGH2)
START-DATE	1 June 2013
END-DATE	31 May 2016
TOTAL BUDGET	€3,400,000
FCH JU CONTRIBUTION	€2,000,000
OTHER CONTRIBUTION(S)	

PARTNERSHIP/CONSORTIUM LIST

Coordinator : CEA

Partners : RAIGI, SymbioFCell, GHR, WRUT, Seifert &Skinner & Associates, H2Logic.

PROJECT WEBSITE/URL

www.project-copernic.com

PROJECT CONTACT INFORMATION

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MAIN OBJECTIVES OF THE PROJECT

- Increasing the maturity and competitiveness of innovative CGH2 manufacturing processes evolving from classical automotive manufacturing technologies or concepts.
- Decreasing costs while improving composite quality, manufacturing productivity and using optimised composite design, materials and components.
- All-in-one innovative high-pressure tank component.
- Assessment of structural health monitoring (SHM) for compressed overwrapped pressure vessels (COPV).

PROGRESS/RESULTS TO DATE

- Public/private website with monitoring dashboard operational
- Final specifications toward market requirements
- First choices of alternative materials and composite design architecture
- Review of manufacturing technology improvement axis

FUTURE STEPS

- Conclusion on enhanced materials characterisation
- Tanks using selected enhanced materials
- Conception and modelling of optimised tanks
- All-in-one fully integrated on-tank valve with pressure regulation and safety management

CONCLUSIONS, MAJOR FINDINGS AND OUTLOOK

At month 12, the main Copernic project activities concern:

- Comparative assessment of different performance/cost improvement strategies for CGH2 composite cylinders;
- Assessment of non-destructive methodologies to provide structural health monitoring of COPV;
- Certification of an innovative fully integrated on-tank valve.

CONTRIBUTION TO THE PROGRAMME OBJECTIVES

SOURCE OF OBJECTIVE/ TARGET (MAIP, AIP)	ASPECT ADDRESSED	PROGRAMME OBJECTIVE/ QUANTITATIVE TARGET	PROJECT OBJECTIVES/ QUANTITATIVE TARGETS	CURRENT STATUS/ ACHIEVEMENTS TO DATE
MAIP AA1	Design and test criteria for high-pressure composite		Contribution to the advancement of relevant test methods by generation of accurate data material and processes sensitivity to tank performance and safety	Testing protocols defined with respect to standards and modelling activities Testing activities just started
AIP 2012	Development activities on materials		Assess alternative materials with the target to improve performance/cost ratio	First choice of alternative materials selected
AIP 2012	Lower cost production processes		Assess manufacturing technology improvement strategies Reduce cost of metal bosses by a factor of 5	Ongoing comparative assessment of conventional Vs innovative winding technologies First choices of equipment improvement actions selected, under implementation on pilot line (increased productivity).
AIP 2012	Improved complete tank systems and related components characterised by reduced weight and volume Pressure regulators, valves, sealing...	Gravimetric system density>4.8	- Improved composite designs for 15% weight savings - Increased gravimetric storage density system >4.8%wt - 20-30% cost reduction for innovative pressure components	- State-of-the-art completed - Material characterisation for improved hydrogen tightness - Pressure device under definition - Reference tank selected
AIP 2012	On- or off-board diagnosis systems for containers		Develop and assess non-destructive evaluation methods for structural health monitoring of COPV	Definition of an optical fibre-based strategy for SHM First trials of SHM to monitor stresses during manufacturing of composite vesselsufacturing of composite vessels