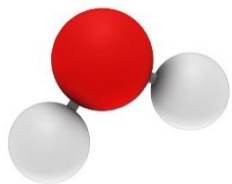


Plenary Session

- Introduction to Project Results



HERCULES-2

**FUEL FLEXIBLE, NEAR-ZERO EMISSIONS, ADAPTIVE PERFORMANCE
MARINE ENGINE**



GA 634135

Agenda

Day 2

10th October 2018

9.00

FORUM (Plenary Session)

Welcome (MAN ES-AUG)

Introduction (Coordinator)

All Participants

9.15

8 x WP Leaders' Presentations (WP Leaders)

HERCULES-2 Results

11.00

Posters Session

Coffee Break

11.30

Panel I: Hercules Achievements

Intermission

12.30

Panel II: The future in marine engines

13.30

Roundup (Coordinator)

Closing Remarks (MAN ES-AUG)

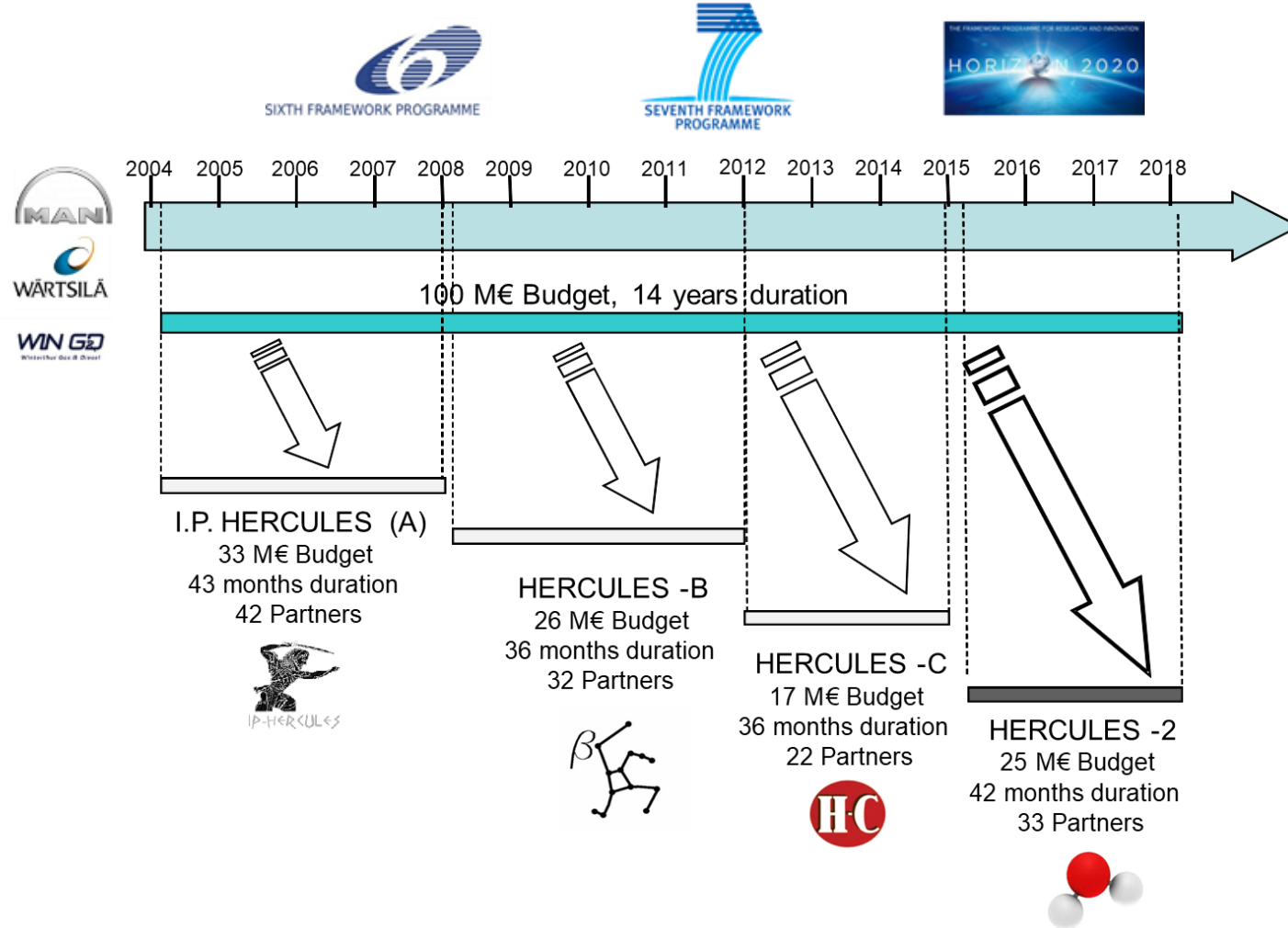
13.45

Posters Session/Lunch

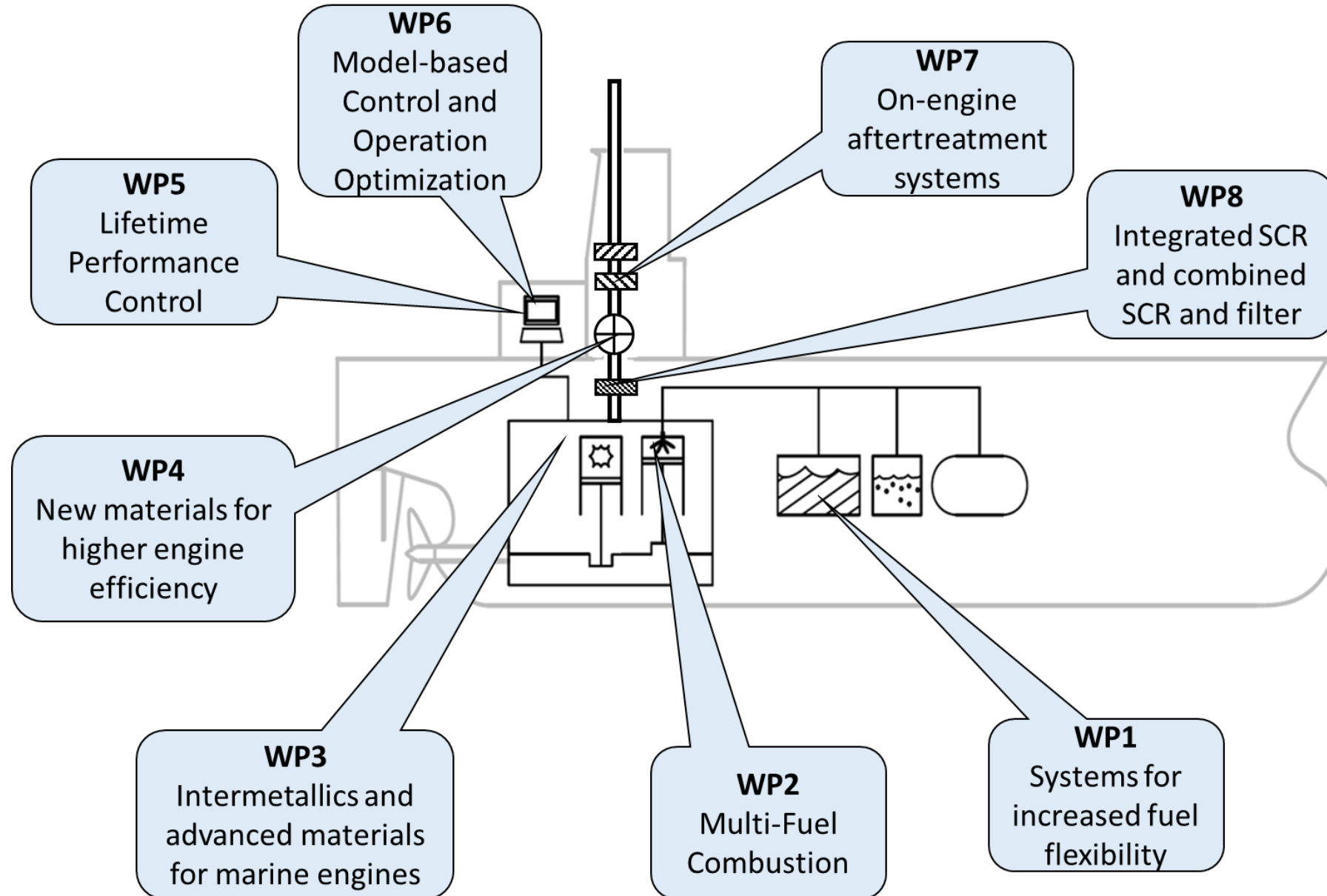
15.00

End of Forum

The HERCULES Programme Timeline



HERCULES-2 R&D Workpackages



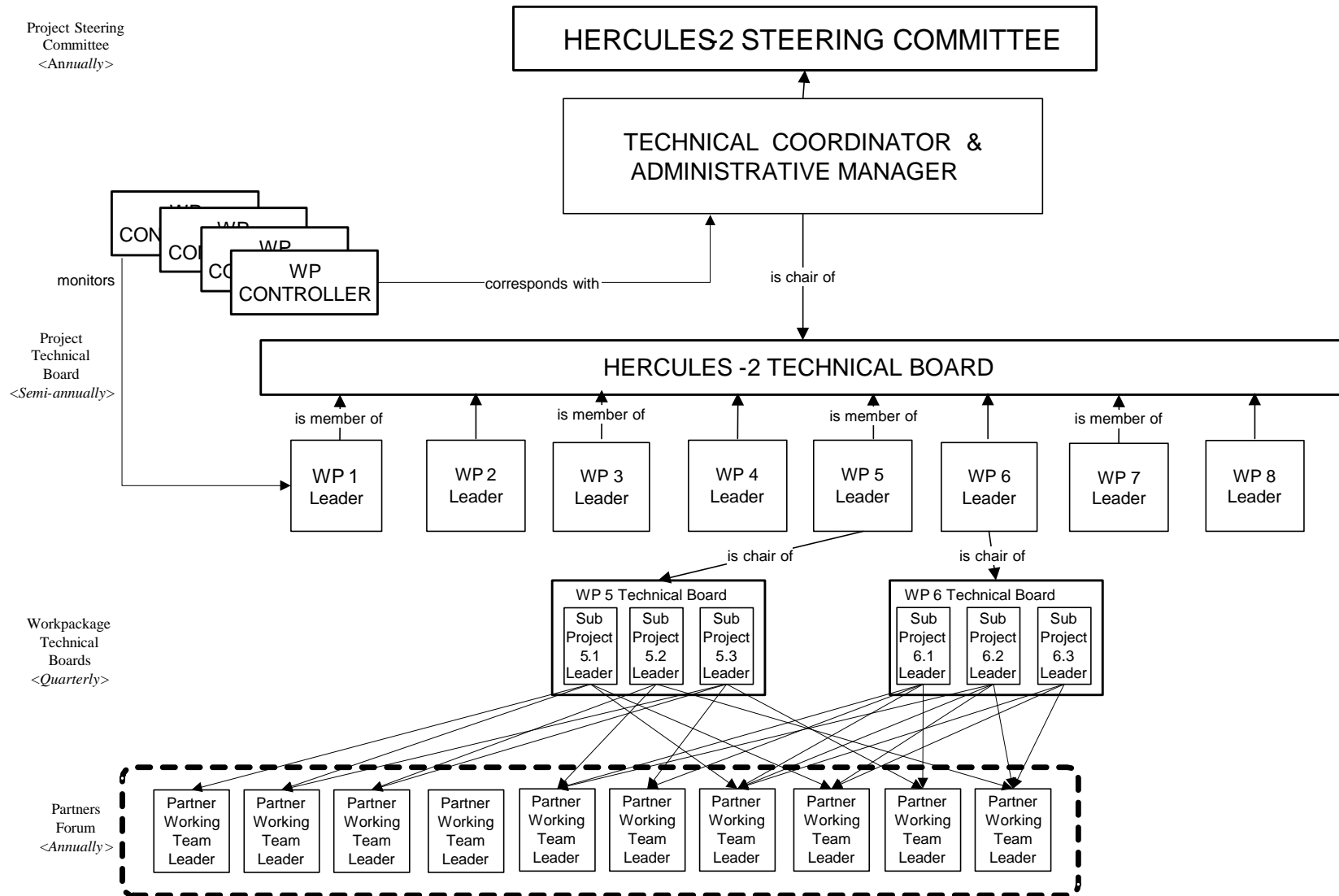
1. To improve **fuel flexibility**
2. To formulate **new materials** to support high temperature applications
3. To develop adaptive control methodologies to retain **lifetime** powerplant performance
4. To achieve **near-zero emissions**



HERCULES-2 Partners

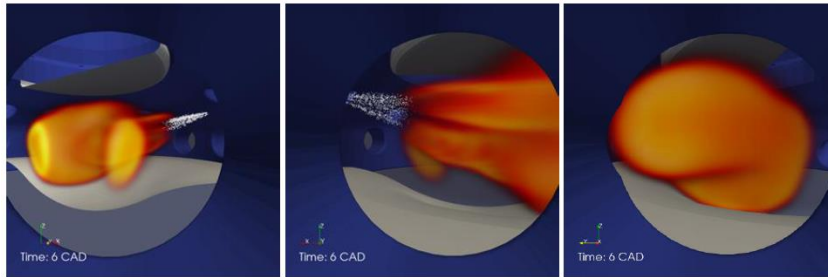
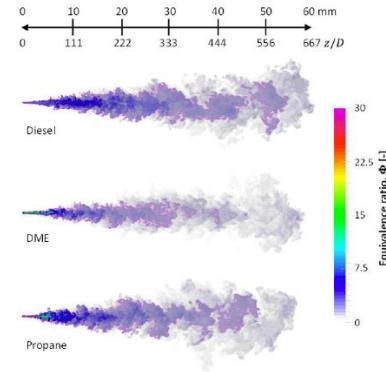


H-2 Management Structure

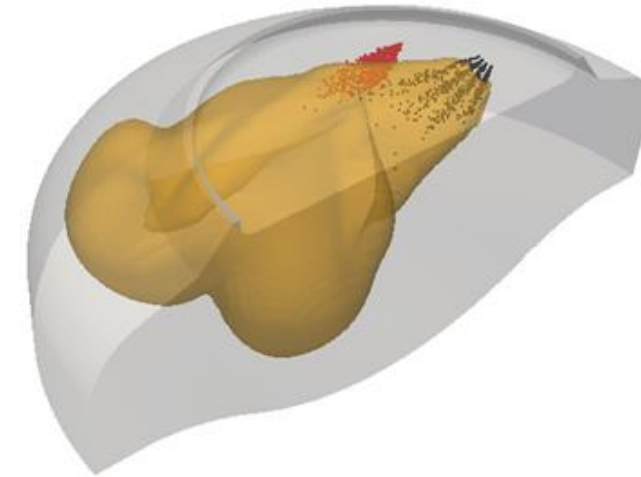


H-2 objective: Fuel flexible engine

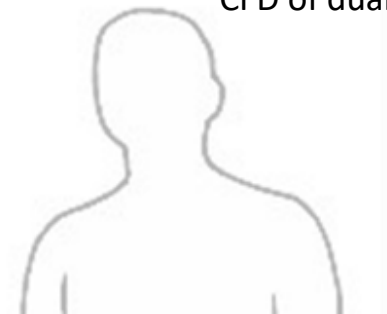
Large Eddy Simulation (LES) of evaporating fuels: Diesel, dimethyl ether (dme) and propane



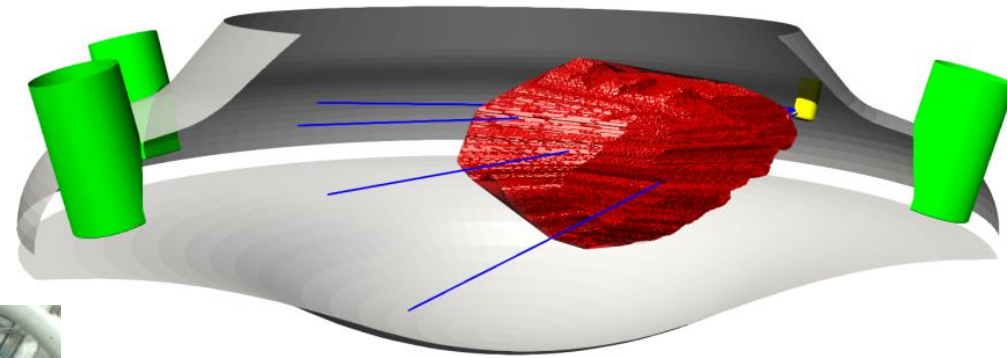
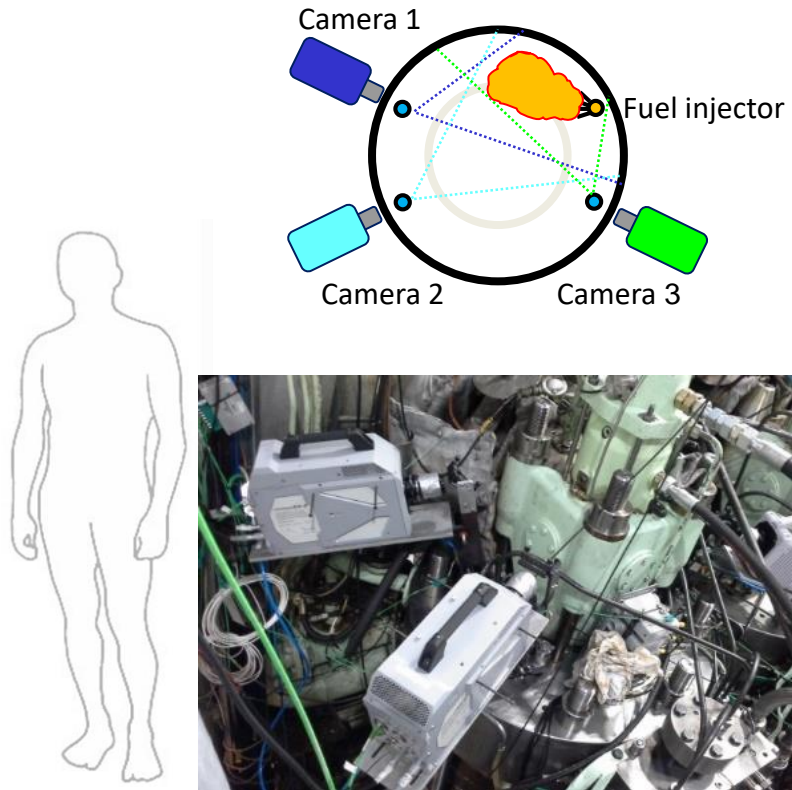
Flame rendering from CFD, as it would appear from the three cameras



CFD of dual-fuel combustion in two-stroke marine engine

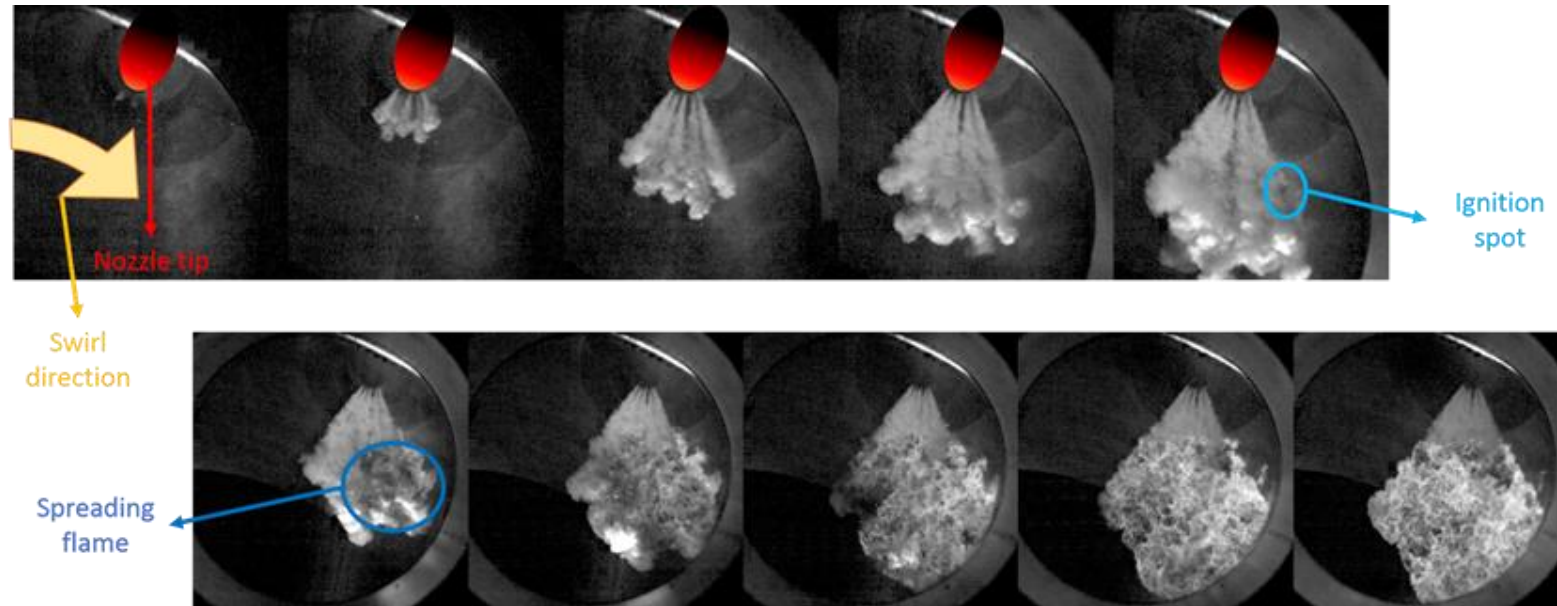


H-2 objective: Fuel flexible engine



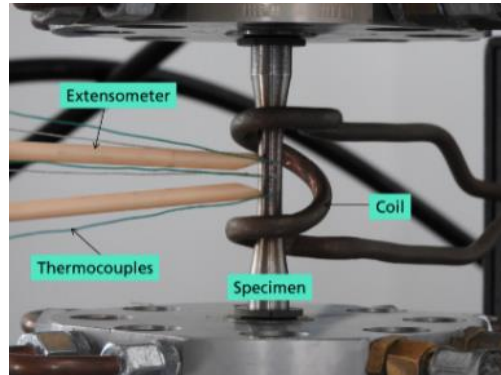
Triple-camera high-speed imaging on two-stroke dual-fuel engine
reconstructed 3D flame kernel

H-2 objective: Fuel flexible engine

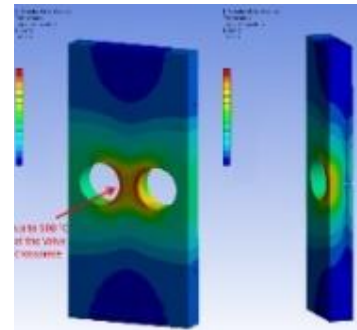
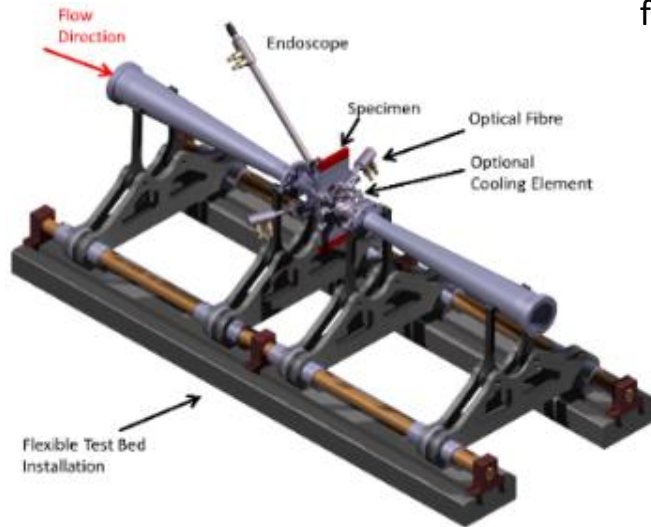


Multi-camera mapping of 3D flame shape in two-stroke dual-fuel engine

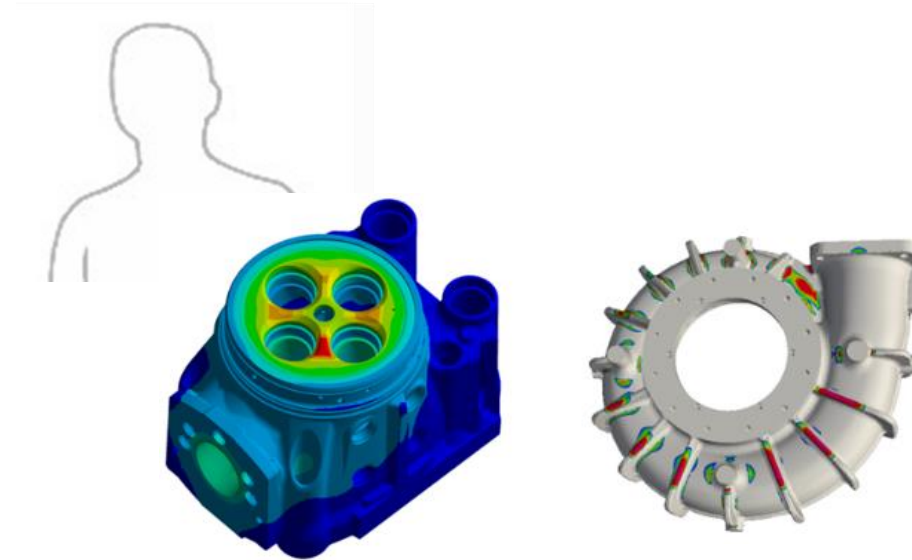
H-2 objective: New Materials (Applications in engines)



Test set-up for thermomechanical fatigue

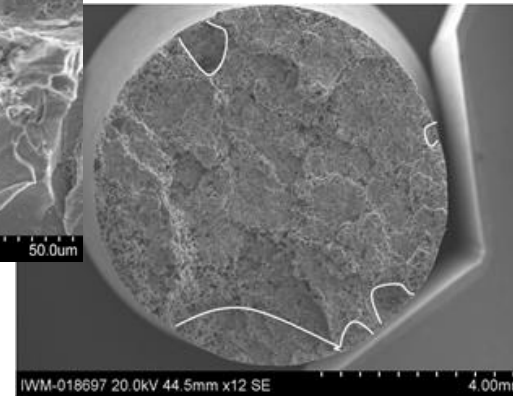
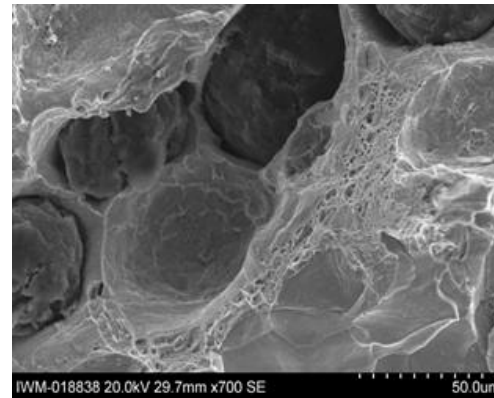
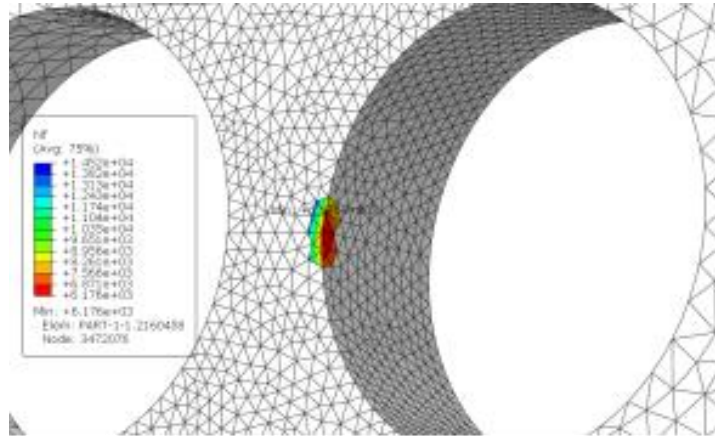


TMF test rig and specimen



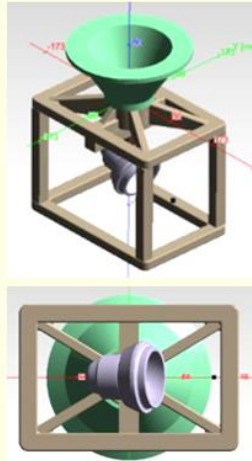
New materials investigation for cylinder head and turbine casing

H-2 objective: New Materials (Applications in engines)



H-2 objective: New Materials (Applications in engines)

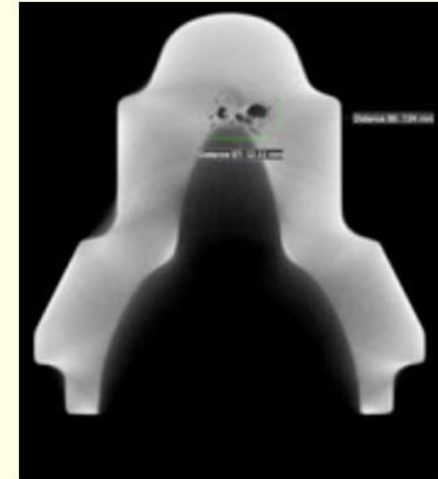
Casting simulations



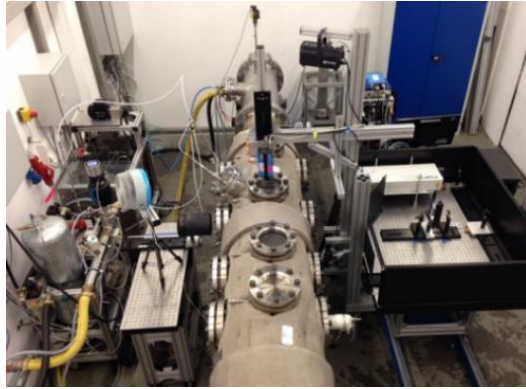
Investment casting



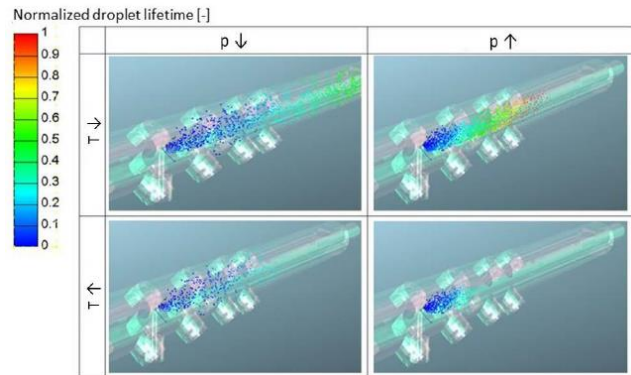
NDT-testing via CT-scans



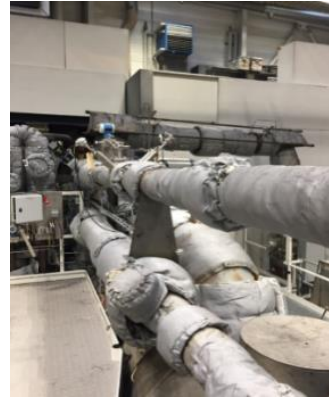
H-2 objective: Near-Zero Emissions Engine



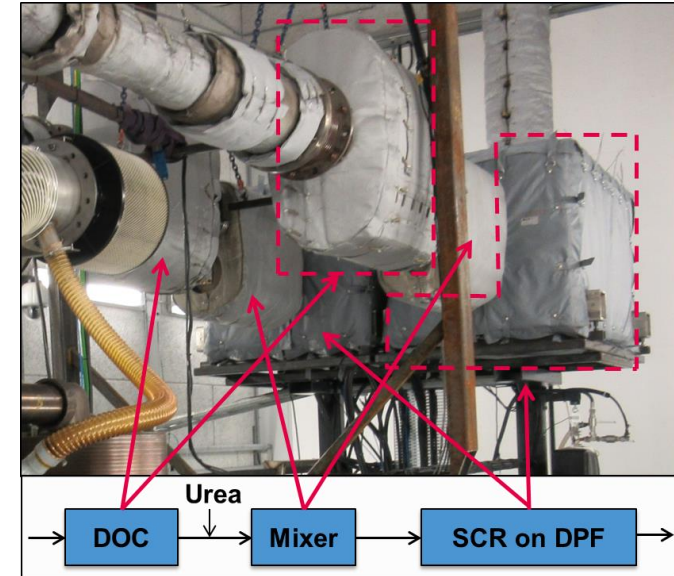
Hot gas test rig for urea decomposition investigations



Simulated spray behaviour at different operating conditions

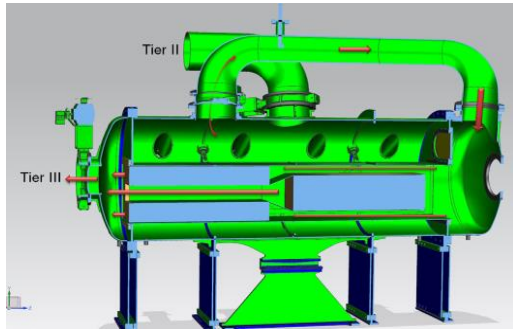


Mini SCR system for urea mixing/evaporator study

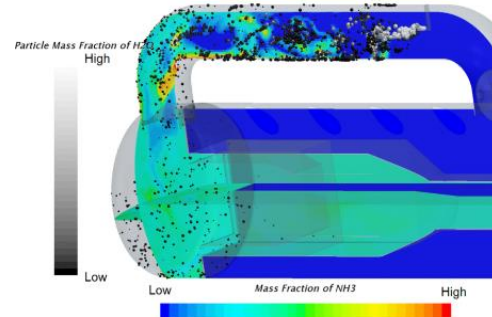


Exhaust aftertreatment (EAT) system, Diesel Oxidation Catalyst (DOC) & SCR coated Diesel Particulate Filter (DPF), installed in full scale.

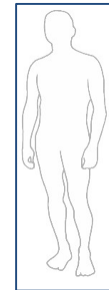
H-2 objective: Near-Zero Emissions Engine



Engine integrated High Pressure SCR system



Exhaust gas flow inside the integrated SCR



Engine Integrated SCR Installation on a 2 stroke 4 cylinder diesel engine.

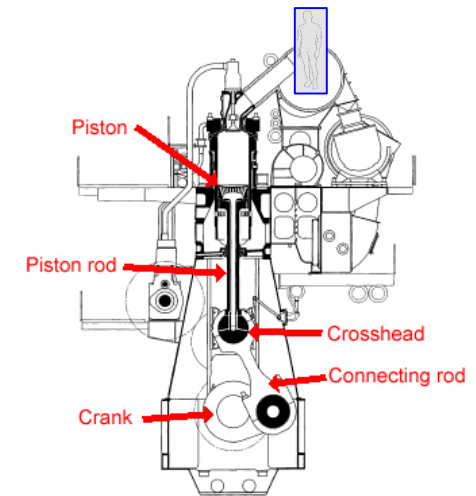
H-2 objective: Near-Zero Emissions Engine



Installation of field test catalyst device in exhaust manifold



Inspection of field test catalyst device in exhaust manifold



Agenda

Day 2

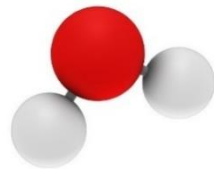
10th October 2018

9.00	FORUM (Plenary Session) Welcome (MAN ES-AUG) Introduction (Coordinator)	All Participants
9.15	8 x WP Leaders' Presentations (WP Leaders) HERCULES-2 Results	
11.00	Posters Session <i>Coffee Break</i>	
11.30	Panel I: Hercules Achievements <i>Intermission</i>	
12.30	Panel II: The future in marine engines	
13.30	Roundup (Coordinator) Closing Remarks (MAN ES-AUG)	
13.45	Posters Session/Lunch	
15.00	<i>End of Forum</i>	



Plenary Session

Roundup



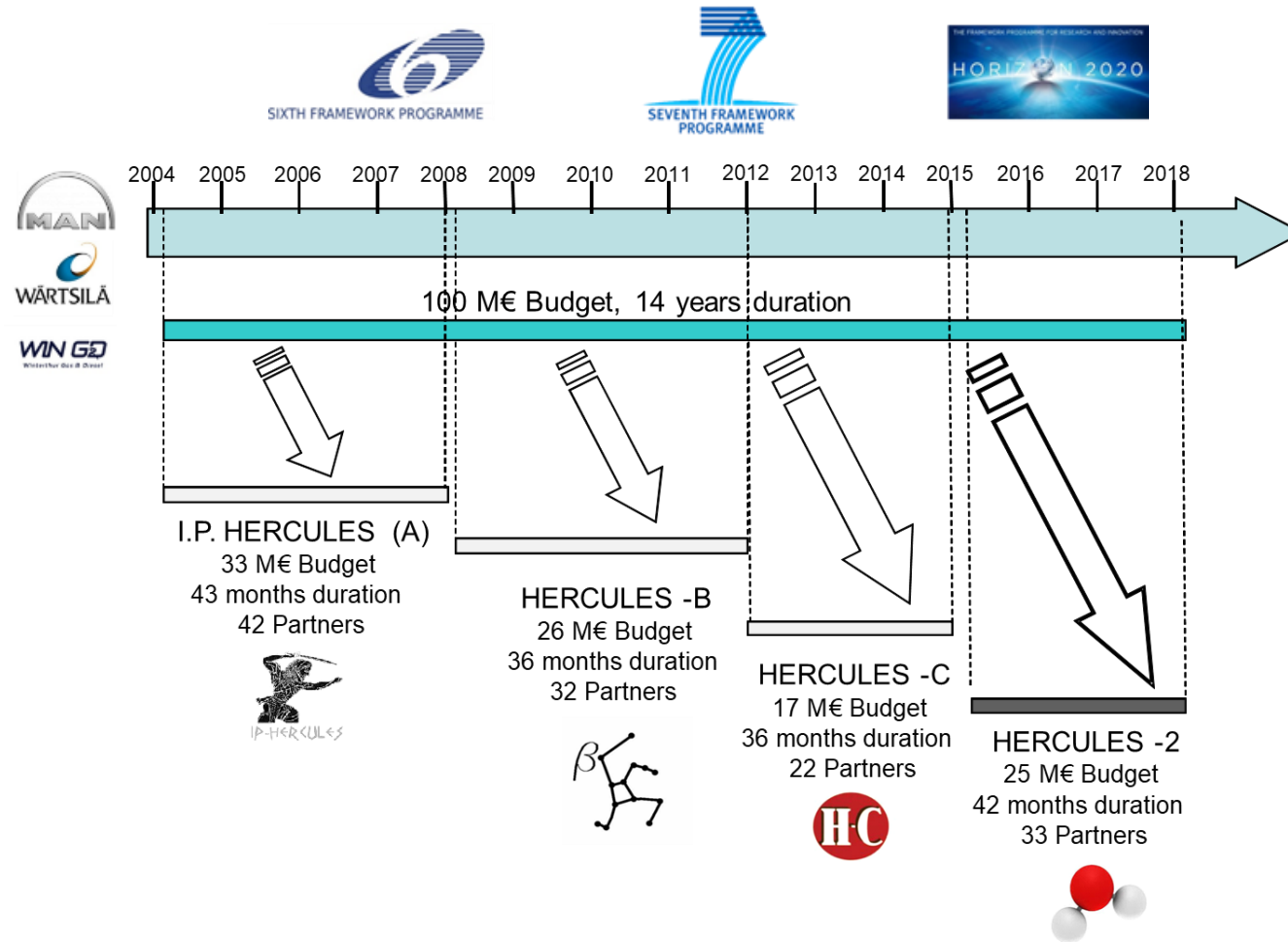
HERCULES-2

**FUEL FLEXIBLE, NEAR-ZERO EMISSIONS, ADAPTIVE PERFORMANCE
MARINE ENGINE**



GA 634135

The HERCULES Programme Timeline



- HERCULES ends after **14(+2)=16** years from conception, at a point where all involved are reasonably content.



- The name HERCULES was fitting, regarding the Labours of the **75+** partners...



....and the **>300** involved engineers & scientists.

The results of the project are described in **1000s** of pages of Reports but also in **~150** publications!



HERCULES Coordination

- The overall Management of the project was a balance between **formalism & practicality**.
- Administration involved some **unsung heroes** within the Core Group .
- Interaction with main funding agency EC had some **uneasy moments** but in general was **OK**, with bureaucratic procedures overall improving with the years.
- Although some times the feeling was:



-
- A major achievement of HERCULES was the **social engineering** success, towards **technological co-habitation**.
 - There has been **Respect & Goodwill** among the partners
 - There has been **Camaraderie** within the Core Group
 - **Cooperation** between market competitors is a key to success.

So, HERCULES says farewell...



Hercules ascending from the pyre, Alessandro Algardi ,1617-1654, British Museum

Closing remarks: MAN SE (hosts)

As the fire burns his mortal part of demi-god Hercules is taken by goddess Athena, on a chariot, to Mount Olympus, as god.

