Karlsruhe Institute of Technology

AMICI WP 5.3

Harmonisation – Cryogenic safety procedures

AMICI 2nd Annual Meeting, January 22, 2019

Steffen Grohmann on behalf of KIT, CEA, CERN

Objectives

1) Under the EU regulations, this task will **organise the exchange of knowledge and procedures** in order to obtain a **common methodology** used by labs and industry for the design and **fabrication of cryogenic equipment**.

2) This will be achieved by **organising and coordinating a working group** at the **European Committee for Standardization (CEN)**, where additional experts from Universities, research labs and industry will participate.

3) Its aim is to **compose a draft European standard** on **safety of cryogenic equipment**, merging and harmonising state-of-the-art rules and codes from various labs and organisations.

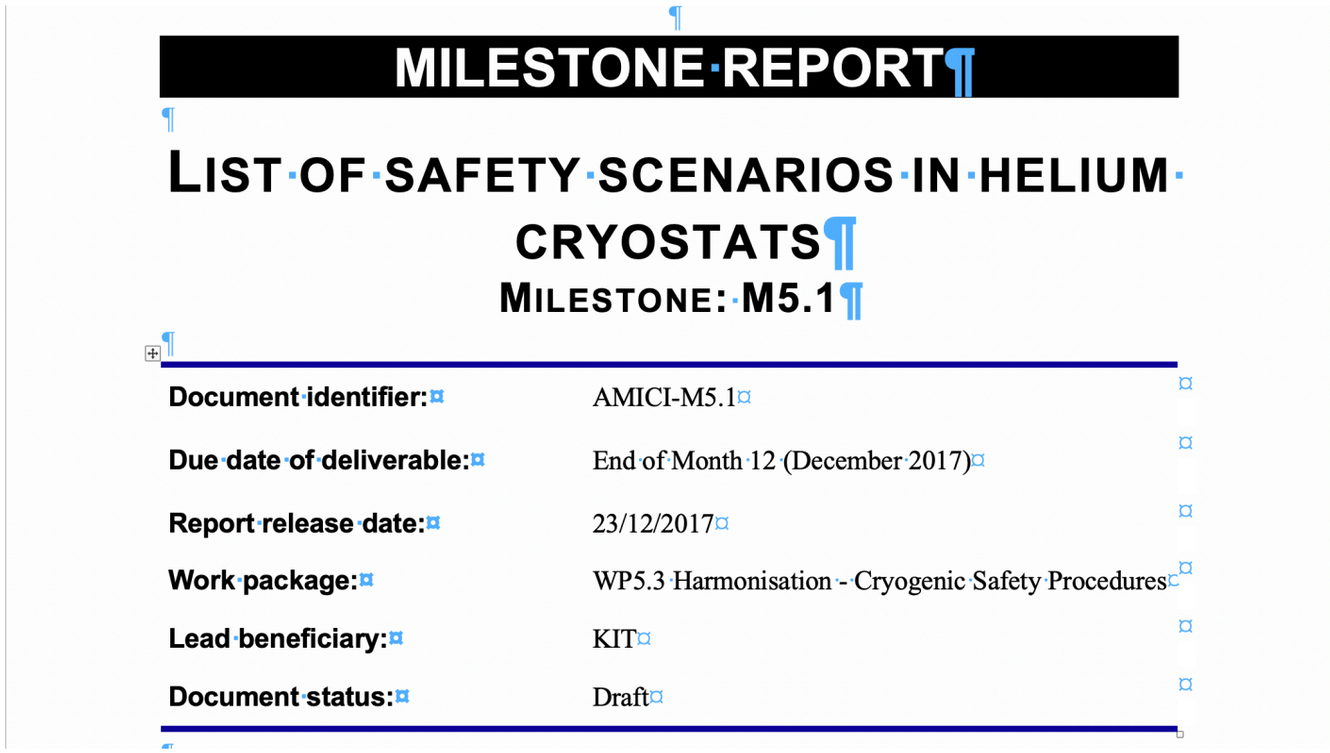
Objectives

4) Beyond the actual state-of-the art, this task will **collect and assess available modelling codes**, which are able to consider and **analyse the process dynamics** of cryogenic incidents.

5) In addition, the task will **define the scope of future experiments and model developments** required to consolidate and evolve the proposed common methodologies. This concern specifically the **experimental basis required for the implementation of dynamic models** in a common standard, as well as **performance data of pressure relief devices under cryogenic conditions**.

Deliverables

- Milestone MS5.1 (12-2017)



MILESTONE REPORT

LIST OF SAFETY SCENARIOS IN HELIUM CRYOSTATS

MILESTONE: M5.1

Document identifier:	AMICI-M5.1
Due date of deliverable:	End of Month 12 (December 2017)
Report release date:	23/12/2017
Work package:	WP5.3 Harmonisation - Cryogenic Safety Procedures
Lead beneficiary:	KIT
Document status:	Draft

- Final report (04-2019)
  - Project prolongation welcome…

Foundation of new working group

CEN/TC 268/WG6

Karlsruhe Institute of Technology

New working group

CEN/TC 268 - Cryogenic vessels

General | Structure | Work programme | Published Standards

CEN/TC 268 Scope

Standardization in the field of insulated vessels (vacuum or non- vacuum) for the storage and the transport of refrigerated liquefied gases ,as defined in Class 2 of "Recommendations on the Transport of dangerous goods - Model regulation" , in particular concerning the design of the vessels and their safety accessories, gas/materials compatibility, insulation performance, the operational requirements of the equipment and accessories. The one-off preparation of standards for hydrogen technologies strictly meeting the European mandate on the draft Directive deployment of alternative fuels infrastructure.

Officers

Chairperson	Dr Hervé Barthélémy
Secretary	Ms

General | Structure | Work programme | Published Standards

CEN/TC 268 Subcommittees and Working Groups

Working group		Title
CEN/TC 268/WG 1		Design
CEN/TC 268/WG 2		Compatibility, insulation, accessories
CEN/TC 268/WG 3		Operational requirements
CEN/TC 268/WG 5		Specific hydrogen technologies applications
CEN/TC 268/WG 6	July 2017	Specific helium technology applications

Aim of CEN/TC 268/WG6:

New European Standard on *„Helium Cryostats – Protection against excessive pressure“*

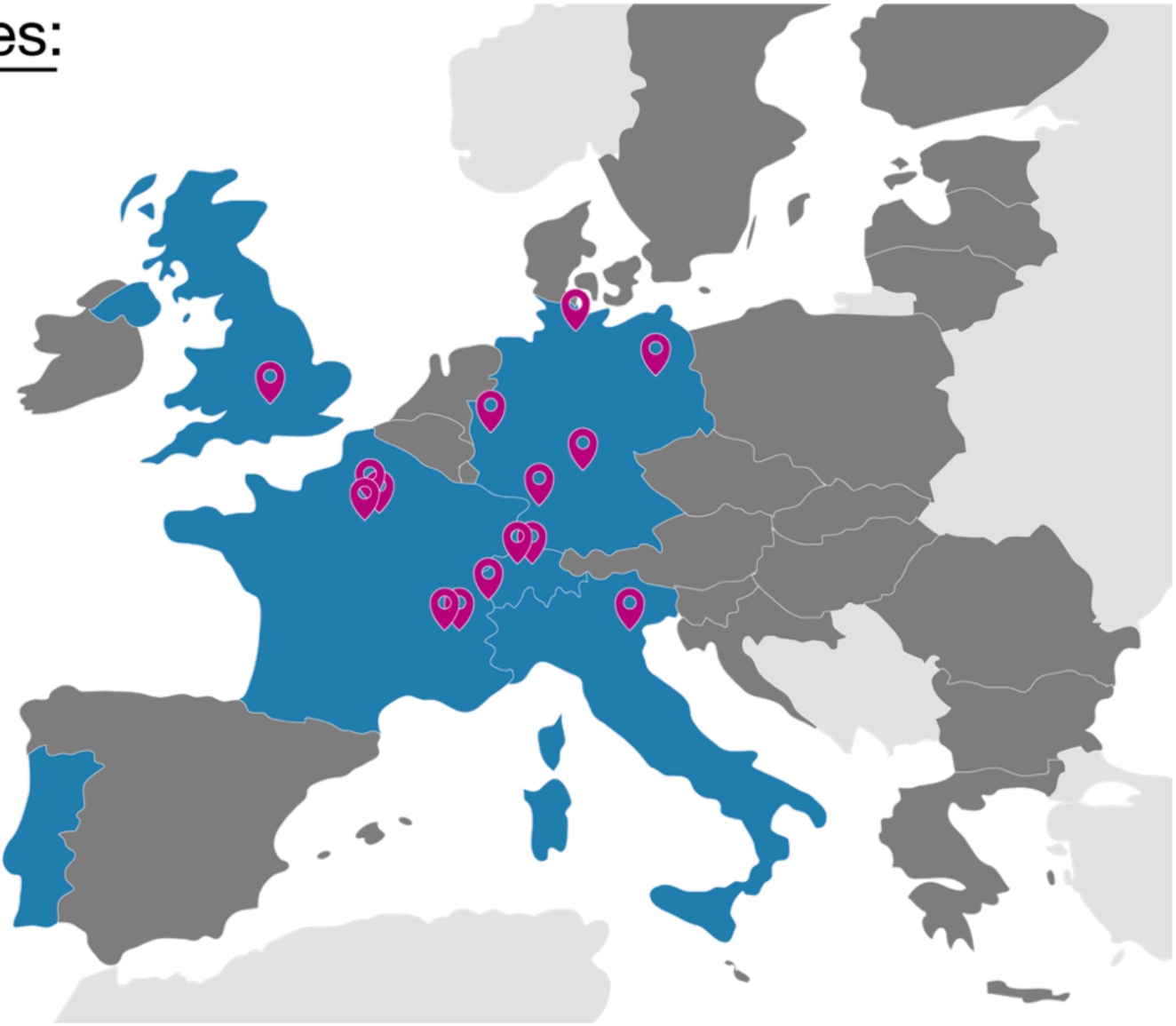
Organisations contributing to CEN/TC 268/WG6

Karlsruhe Institute of Technology

National Standardisation Bodies:

DIN afnor GROUPE bsi.

UNI ENTE ITALIANO DI NORMAZIONE · Instituto Português da Qualidade · SNV



Organizations:

Air Liquide creative oxygen · BILFINGER · cea · CERN

HEROSE · INFN · KIT Karlsruhe Institute of Technology · Linde

PAUL SCHERRER INSTITUT PSI · Science & Technology Facilities Council

Status of the new Standard

- Helium cryostats – Protection against excessive pressure

Issue	Description
Administration	• Convener S. Grohmann • Secretariat DIN office • 8 working group meetings up to now
Structure	• **Risk assessment** • **Protection concepts** • **Dimensioning of pressure relief devices** • Pressure relief devices • Substance release • Operation of helium cryostats
Challenges	• Document status: **Standard** vs. **Technical Note** • Interpretation of „requirements“, „recommendations“, … • Scope: Dimensioning only vs. complete topic, incl. operation
Goal	• Submit the draft standard in 2019

Outreach

Publications

- Presentation and paper at the ICEC 27, Oxford, 09-2018
- Further publication at CEC 07-2019

Status of a European Standard for the protection of helium cryostats against excessive pressure

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Abstract.

The overpressure protection of various types of cryogenic vessels is covered by a number of International Standards. Helium cryostats, however, include additional components such as superconducting magnets and cavities, electrical heaters and control valves with associated piping, which significantly influence the potential risk. At the European Committee for Standardization CEN, a new working group was hence founded as CEN/TC 268/WG6, dealing with 'Specific helium technology applications'. Its aim is to develop a European Standard for the protection of helium cryostats against excessive pressure that is harmonized with the European Pressure Equipment Directive. It will cover the typical conditions in accidental scenarios in order to harmonize the risk assessment as well as design practices for the pressure relieving systems. We report about the general concept of this new Standard, its structure and content, and the actual status of the project.

Conclusions

- Fulfilment of objectives

No.	Item	Result
1	Exchange of knowledge, commong methodology	OK
2	New working group at CEN	OK
3	Compose draft European Standard	OK[1)]
4	Modelling of process dynamics	OK[2)]
5	Define scope of further experiments	… open

1) Project prolongation is welcome

2) Two PhD thesis (2018, 2019)