SAFETY AND LOSS PREVENTION

The Hydrogen Knowledge Centre, and developing policies for the network becoming hydrogen ready

16th June 2021
IGEM UPDATE

• INTRODUCTION TO IGEM

• HYDROGEN COMMITTEE

• KEY STAKEHOLDER ACTIVITY
  – BEIS HYDROGEN MANAGEMENT
  – RAENG UPDATE

• STANDARDS ACTIVITY
  – HYTECHNICAL STANDARDS UPSTREAM
  – HYDROGEN STANDARDS DOWNSTREAM
  – HYDROGEN QUALITY WORKING GROUP

• POLICY AND RESEARCH HUB

• HYDROGEN KNOWLEDGE CENTRE
About IGEM - Our Heritage

- Formed in 1863
- Awarded Royal Charter 1929
- Global Membership Individuals and Organisations
- Registered Charity
- Licensed by the Engineering Council for the award of professional titles
  - Engineering Technician (EngTech)
  - Incorporated Engineer (IEng)
  - Chartered Engineer (CEng)
- Standards for:
  - Transmission and distribution
  - Safety
  - Legislation
  - Measurement
  - Utilisation
  - General
  - Industry Guidance
NEPC and Net Zero

January 2020- ongoing

• Thought leadership and problem definition
• Applying systems thinking and methods
• Convening diverse stakeholders – not just engineering
• Working directly with government on policy challenges
• Raising cross-cutting issues: governance, infrastructure, digitisation, resilience & adaptation
HyTechnical - Standards for Hydrogen Transmission and Distribution

- **Workstream 1** – LTS Futures Work Packages Complete
  - Assessment of Operational Issues for PRIs and Other Installations for Hydrogen and Hydrogen/Natural Gas Service. Report Completed
  - Assessment of the Inspection, Maintenance and Repair Requirements for Hydrogen and Hydrogen/Natural Gas Mixture Pipelines. Report Completed
  - TD/1 BPDs and QRA plus Impact assessment on TD/1 parallel pipeline separation distances. Report Completed

- **Workstream 2** - Development of Supplements for Change of Use and New Build for Application of H₂ and NGH₂ Blends
  - TD/1, Steel pipelines and associated installations for high pressure gas transmission – Draft for Approval
  - TD/13 > 7 Bar Pressure regulating installations for natural gas – Draft for Approval
  - TD/13 < 7 Bar Pressure regulating installations for natural gas – Working Draft
  - TD/3, Steel and polyethylene (PE) pipelines for gas distribution – Working Draft
  - TD/4, Polyethylene (PE) and steel gas services and service pipework - Working Draft

- **Workstream 3** – Hazardous Area Assessments for H₂ and Natural Gas/H₂ Mixtures
  - SR/25 Supplement
    - Phase 1 report complete
    - Phase 2 – Kick off meeting 18th May completion November 2021

- **Workstream 4** – Venting
  - SR/23 Review of thermal radiation and noise for Hydrogen on going
Hydrogen Standards Downstream

Contents of IGEM/H/1 Hydrogen Reference Standard

Section 1 - Introduction
Section 2 - Scope
Section 3 - Legal and Allied Considerations
Section 4 – Background
Section 5 - Characteristics of Hydrogen
Section 6 - Effect on Materials
Section 7 – Effect on Application
  – Construction, flueing and ventilation
  – Risk Assessment
  – Hazardous Areas

Section 8 - Effect on Practices
  – Metering
  – Design and Installation of Pipework
  – Appliance Installation
  – Testing, Purging & Commissioning
  – Detection & Response

Appendices
  – Hydrogen Purity Standard
  – Glossary, Acronyms & Symbols,
  – References,
  – Further detail,
Hydrogen Standards Downstream

The Competence Framework includes:

- Mapping of Hydrogen properties in comparison with familiar natural gas and LPG
- Identification of aspects that require changes to current installation, maintenance and repair practice
- Recognition of additional Skills, Knowledge and Understanding required for hydrogen installations
- A Training Specification aligned to IGEM/IG/1
- An ACoP Assessment Module approved by SMB
- Development of an Interim Technical Standard Needed to underpin both Training and Assessment
- Agreed and commissioned in November 2020
- Joint approach involving EU Skills and IGEM
- Two Stage consultation exercise due to completed in February
- Final Interim Standard scheduled for delivery to BEIS at the end of March
- Training Specification and Assessment Module to be referenced to that Standard

- Next Steps – post March Hy4Heat project has ended
## Hydrogen Standards Downstream

### Activities and Deliverables

<table>
<thead>
<tr>
<th>Item</th>
<th>Activity</th>
<th>Description</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Research Gap Definition and Closure Support</td>
<td>Defining research/required evidence (i.e., Questions to be answered) working with Mott MacDonald. Support to R&amp;D Organisations and Evaluate Research. Includes latest learnings from the HKC</td>
<td>Updated Gaps In Standard</td>
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<tr>
<td>2</td>
<td>IGEM/H/1 Reference Standard Update</td>
<td>Assessment of new requirements for inclusion for commercial activities. Update references with latest reports. Close gaps. IGEM Committee oversight and approval.</td>
<td>New Version of the IGEM/H/1 Reference Standard</td>
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<tr>
<td>3</td>
<td>IGEM/H/2 Enabling Standard Domestic</td>
<td>Updated version of the interim standard with research and gap closure learnings. IGEM Committee oversight and approval</td>
<td>New IGEM/H/2 Enabling Standard for Domestic</td>
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<td>4</td>
<td>IGEM/H/3 Enabling Standard Commercial</td>
<td>A comprehensive standard comprising elements of IGEM/UP/2 (pipework), IGEM/UP/1 (Test &amp; Purge), IGEM/UP/16 (DSEAR) and Metering (IGEM/6,8,7b - Installations &amp; Hazardous Areas). IGEM Committee Oversight and approval</td>
<td>New IGEM/H/3 Enabling Standard for Commercial</td>
</tr>
<tr>
<td>5</td>
<td>Training Specification</td>
<td>Supporting the content for the training and assessment specification and alignment with IGEM/H/1; IGEM/H/2 and IGEM/H/3</td>
<td>Training Specification (completed by EUS) including Industry stakeholder workshops</td>
</tr>
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NEW IGEM WORKING GROUP

The scope of the group is expected to cover hydrogen impacts quality on:
• production considering all manufacturing process of the gas. This will include, but not limited to, hydrogen produced from methane reforming, electrolysis and nuclear
• transmission and distribution systems including storage,
• consumer applications and connected to the local distribution and transmission networks converted to hydrogen.
• Transport (both Internal combustion engines and fuel cells) including refuelling stations connected to the gas grid
• Safety in all aspects of the production to consumption and how consumers are affected

Response to N1306 Draft CEN-TC 234 DEC 03/2021 - CIB NWIP for EN Hydrogen quality in converted natural gas systems
Policy and Research Hub

The Policy Research includes:

- Upcoming Publications and Events
- Policy Responses
- Industry Consultations
- Research Library

Policy and research hub - IGEM
Hydrogen Knowledge Centre

• A digital resource for everything related to Hydrogen energy.
• Searchable repository of over 2,100 hydrogen records
• Wide range of sources including
  • public agencies,
  • gas network companies,
  • academic and research institutions,
  • supply chain organisations and
  • Energy and engineering experts
• Launched on 17th March

Hydrogen Knowledge Centre Launch Video
Email: hydrogen@igem.org.uk
www.h2knowledgecentre.com
• QUESTIONS?