

Work Package 2: Refueling Station



WP2: Main Objectives and Partners

Provide inputs for regulatory activities on an EU and Global level to facilitate harmonized procedures for approval of hydrogen refueling infrastructure.

Develop hydrogen specific industrial codes of practice for

- Safe design and operation
- Periodic inspection and maintenance.

Identify components to be harmonized



- **List of existing standards, codes and regulations for hydrogen and conventional fuels.**
- **Documents describing required station components to be harmonized.**
- **Procedure or protocol for maintenance and inspection.**
- **Draft standards and codes of practice that allows introduction of hydrogen refueling infrastructure system.**



Sub-task 2.1: List of existing C&S

Original list of 190 C&S

- **ISO**
 - **ISO TC 197 (Hydrogen)**
 - **ISO 15500 (CNG)**
- **EN**
- **NFPA**
- **EIGA**
- **National**
 - **CPR (Dutch)**
 - **ASME, API**
 - **NORSOK (Norwegian)**
 - **TRG 4XX (German)**
 - **Etc**



The most important C&S for CGH2 Filling Stations

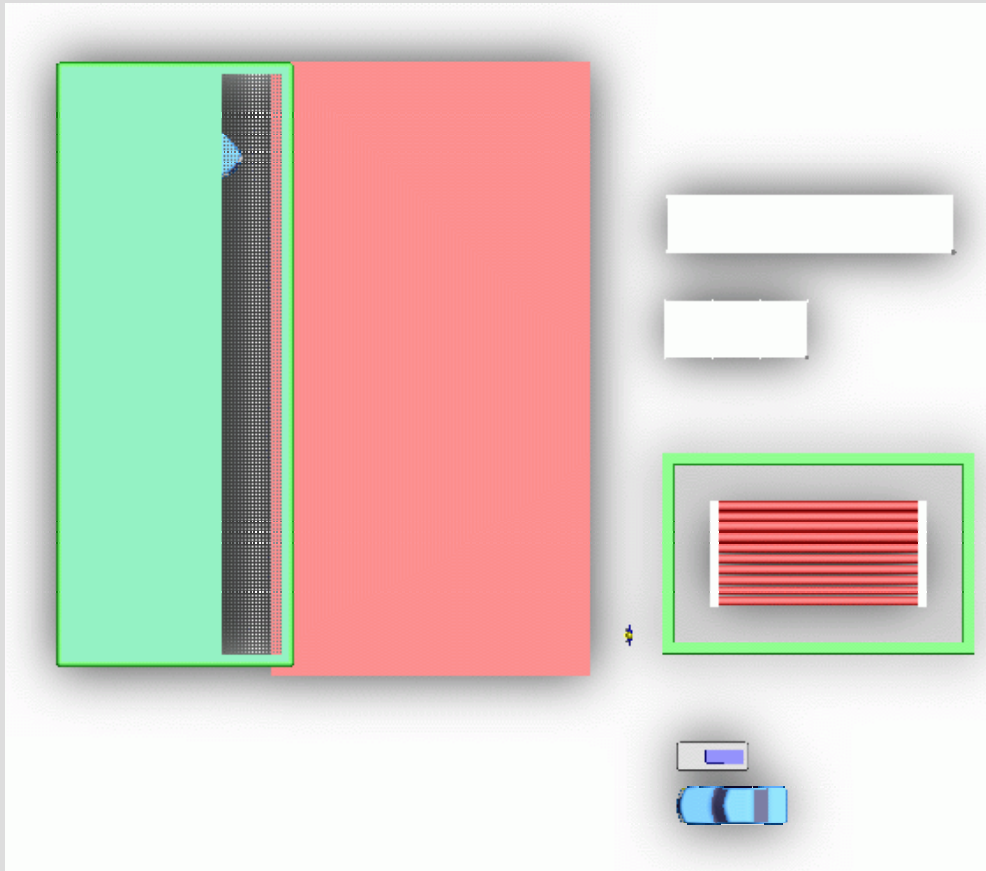
- **ISO/TR 15916**
- **TRG 406**
- **NFPA 50A**
- **EIGA 15/96**



By risk assessment approach, different requirements for H2 processing and refueling stations are developed, based on the following concepts:

- H2 from Methanol Reforming
 - H2 from Ammonia splitting
 - H2 from Natural Gas Reforming
 - H2 from Water Electrolysis
 - LH2 and CGH2 by pipeline and truck
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- The risk assessments are based on the following methods
 - Rapid Risk Ranking
 - HAZOP
 - QRA (Quantitative Risk Assessment)
 - Assessment of safety distances by use of acknowledged simulation tool





Main Components:

Processing Unit

Compressor
Module

CGH2 Storage

Dispenser



Hydrogen technology for refuelling stations is to a certain extent new technology.

This is challenge to authors of drafts and experts of technologies and safety.

Standards should as start be based on general safety requirements.
It is important that standards do not create barriers for improvement of Technologies in the future.

WP 2 will only monitor and comment on proposal level.

EIHP members already participates in TC of ISO

On-going work on standardisation:

ISO/WD 22734 : Water-Electrolysis

ISO/AWI 16110 : Fuel-processor (fossil fuels, e.g. NG)



A proposal for a draft "code" for safe design and operation will be developed:

- First priority is CGH2 compression, storage and dispenser system.
- On-site production and bulk delivery of hydrogen to be added later.
- Requirements for LH2 refuelling stations to be developed later.

The draft proposal may form a NWIP for an ISO standard.



Main objective: To develop a risk-based inspection (RBI) protocol.

- This protocol aims to provide input to the "code" under development in WP2.3 on issues related to inspection and maintenance.
- The main focus will be on CGH2 compressor, storage and dispenser system.
- Issues related to on site hydrogen production and LH will be covered to the degree possible.
- The safety results obtained in WP5.2, for example Rapid Risk Ranking studies and risk acceptance criteria will be utilised as input.

