Demo4Grid
Hazards Identification / Risk Assessment Approach
Workshop on Safety of Electrolysis

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Project reference:
736351

Objective
Demonstration of 4MW Pressurized Alkaline Electrolyser for Grid Balancing Services

Partners
- IHT Industrie Haute Technologie
- FHa Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón
- MPREIS Warenvertriebs GmbH
- FEN Sustain Systems GmbH
- INYCOM Instrumentacion y Components SA

Coordinator
- DIADIKASIA SYMVOULOI EPICHEIRISEON AE

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Project Brief

Project partners providing engineering and equipment:

- IHT – pressurized alkaline electrolysis
- INYCOM – control and command system
- MPREIS – system integration and BoP

Current status of Demo4Grid Project:

- IPPC and building permit received
- Start of civil works in August 2020
- Majority of core components in production

Key data of H2 facility

- 600 Nm³ H2/h @ 30 bar (permit to double capacity)
- 3,2 MWel / max. 9.000 A DC
- 2.300 kg H2 storage @ 30 bar (8 x 100 m³ tanks)
- 2,0 MW dual-fuel burner / 100 mg NOx
- 530 kg H2 storage @ 500 bar (medium pressure HRS)
- 70 kg H2 storage @ 900 bar (high pressure HRS)
- 2 x dispenser 350 bar / 1 x dispenser 700 bar

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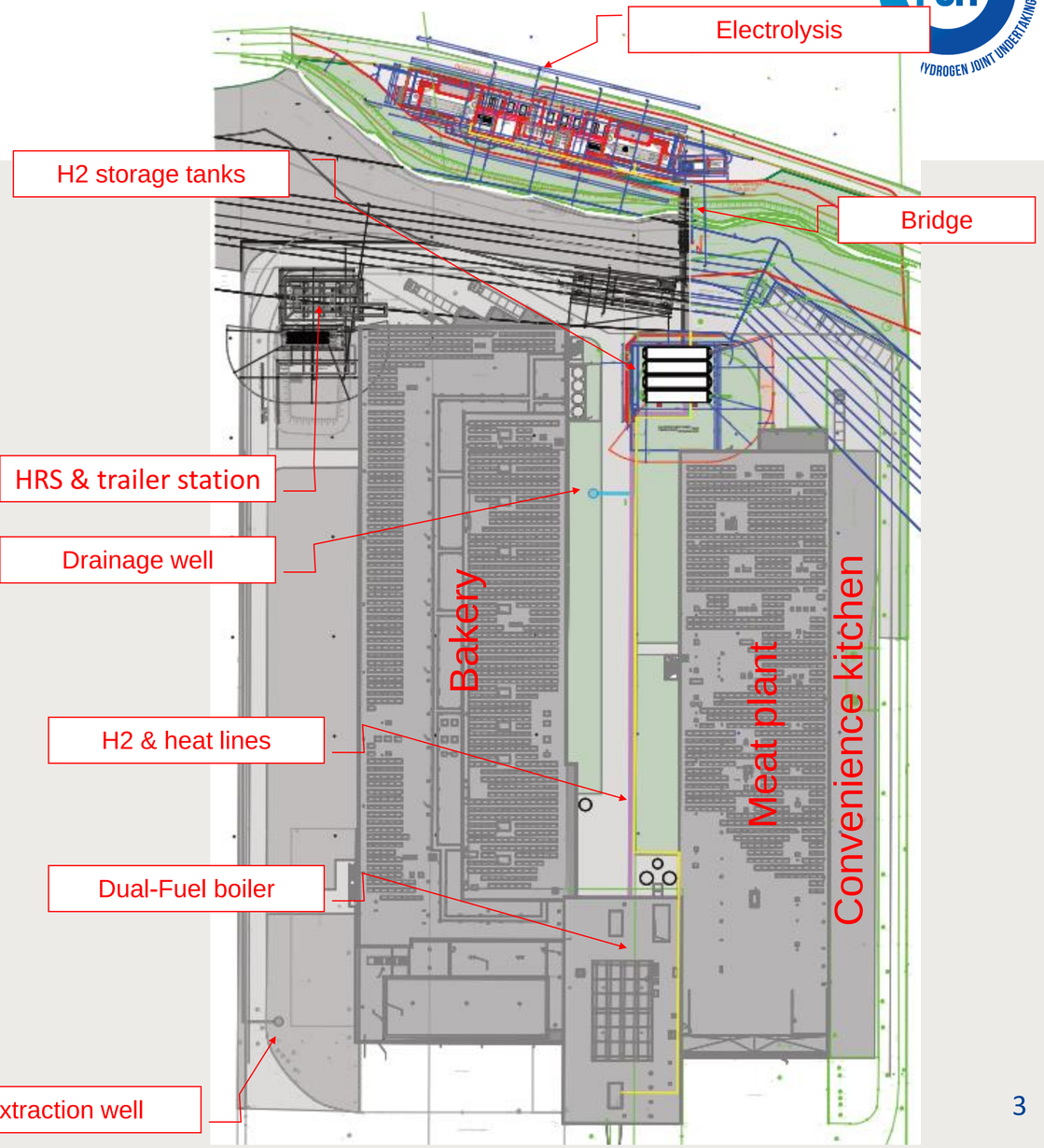
Location

MPREIS facility Völs / Austria

Specifics of location in Völs / Austria

- Entry lane Innsbruck airport (height restrictions)
- Power line (low due to entry lane)
- Natural protection area (space limitations)
- Ground water aquifer (risk of lye leakage)
- Avoidance of Seveso limits (considering existing facility)
- Residential area / close neighbors (noise, bias)



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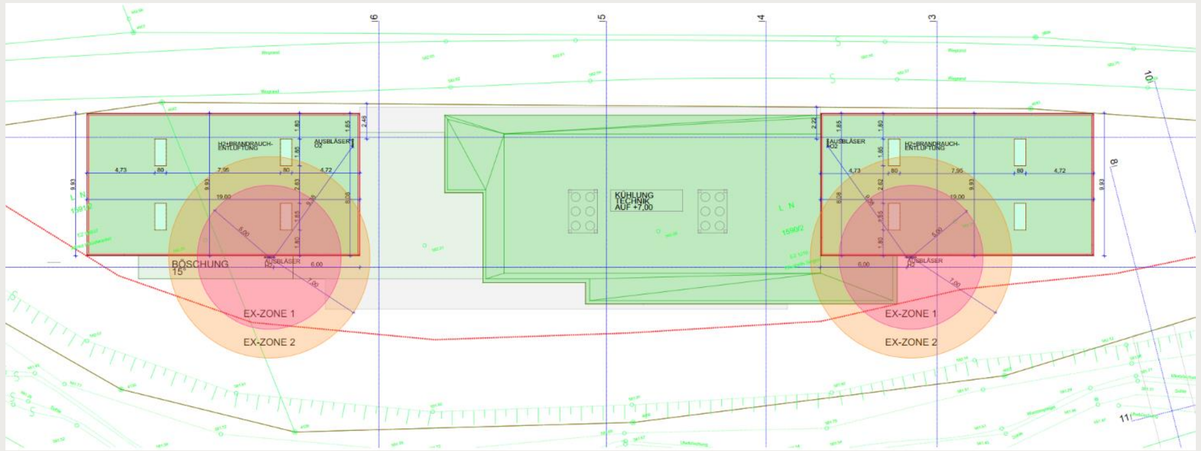
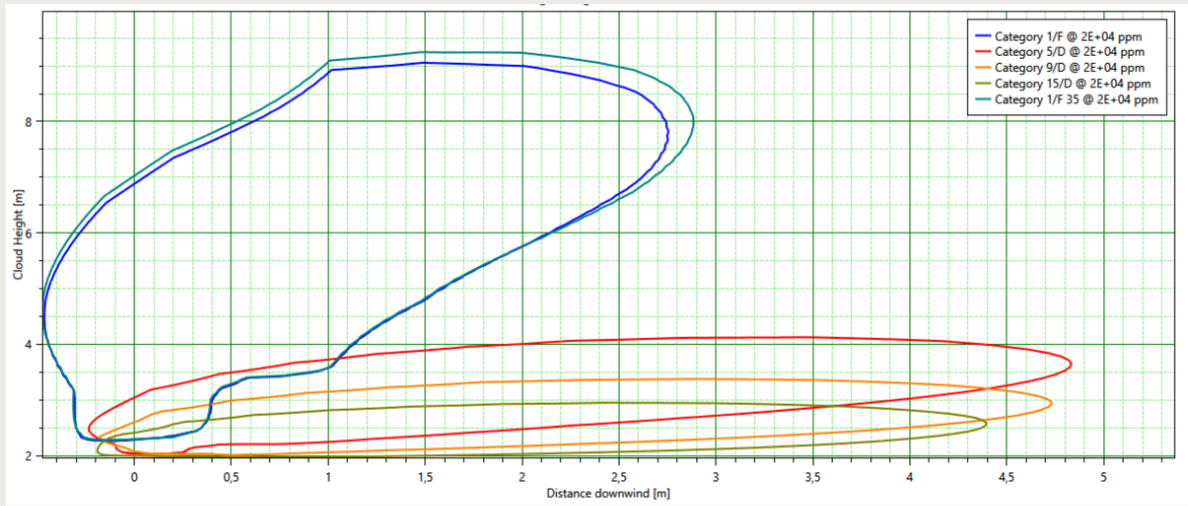
Safety related aspects

Different EHS related aspects are concerned:

- Functional Safety
- Explosion Risk (ATEX)
- Pressure Equipment (PED)
- PE installation (DBA-VO)
- EMC and LV Directive
- Lighting protection
- Fire Safety (acc. AUT Standards)
- Enrichment of deuterium in lye
- …..





Risk Assessments & Prevention – Functional Safety

- HAZID report
- HAZOP report
- SIL Assessment
- SIF specification
- Cause and Effect Diagram
- SIF Calculations
- SIS validation

Structured risk identification and assessment process with input from project team moderated by an consultant (ILF):

30 causes identified triggering different actions (effects) to maintain a safety of the electrolysis and HRS installation.

Causes include:

- Gas pressure
- Lye temperature
- Gas purity
- Fluid levels in gas separators
- Gas Alarm
- Fire Alarm
- ESD Push-Buttons

SIS (safety PLC) will be installed to cover all safety functions and validated with wittiness of a 3rd party during commission.

FUEL CELLS AND HYDROGEN
JOINT UNDERTAKING

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