HyApproval

WP2 – Handbook Compilation

Deliverable 2.2

- PUBLIC -

APPENDIX II

Approval requirements in five EU countries and the USA

Version: 3.0
December 4, 2007

Prepared by:

TNO

+ = Required
- = Not required

Approval requirements for HRS	Netherlands	France	Italy	Germany	Spain	USA
Laws/regulations taken into consideration for the construction of the hydrogen production unit, storage facility and refuelling station	SEVESO II PGS25 (CNG guideline) US NFPA 50A US NFPA 57-02 EIGA 15/96, ISO 15916	(SEVESO II) - Loi Bachelot - Circulaire du 24 mai 1976 relative aux dépôts d'hydrogène liquide ; - Arrêté type – rubrique n° 1416 de ICPE[1] Stockage ou emploi de l'hydrogène ++++++	DM 31/8/2006 SEVESO II Italian Decree on transport and storage of CNG Non binding references: US NFPA 50A EIGA 15/96, ISO 15916	- BetrSichV - Technical Guideline Pressurized Gasses (TRG) for liquefied gasses and natural gas. -Occupational Protection Law (ArbSchG) Manufacturer's own safety concepts	- Real Decreto 2486/1994 [2] - ITC MIE-APQ-5 [3] - ISO 15916: 2004[4]	NFPA 52 NFPA 55 NFPA 30A NFPA 70 NFPA 57 ASME BPV Code Section VIII, DIV. I and Section IX State Regulations
Safety Policy:	1. Prevention of accidents by applying state-of-the-art technology through standards and guidelines 2. Prevention of risks by spatial zoning through the establishment of statutory risk standards that are based on the concepts of location-based risk (PR) and societal risk (GR)	Probability of occurrence v.s. consequences v.s kinetics v.s. gravity. Related to the quantity of hydrogen on site regardless pressure.	Prescriptive based on CNG	Prescriptive according BetrSV	Prescriptive using Spanish compressed natural gas regulations including pressure reservoirs code.	Prescriptive using adopted national codes and standards (sometime adopted and based on experience with CNG)
Best Available Techniques	Required in handbook	Required in handbook		According Guideline Pressurized Gasses (TRG 406)	According to (inter)national codes and standard. Required in handbook	According to national codes and standards
Statutory Risk standards	Applied: for Local Risk 10^{-6} /jr.	Hazard/objects/ vulnerabiliy reference map (Aléa) according to Plan de Prévention des Risques Technologiques. No clear acceptance criteria. The prefet gives final authorization		External Safety not always considered because approval according BetrSV However competent authority on external safety involved.	External safety is part of the environmental permit	External safety is an important issue that is addressed by individual states and local jurisdictions using the national codes and standards. No acceptance criteria
Contingency Planning	Required	Dedicated plan can be made: Plan Particulier d'Intervention	Similar to ordinary and CNG refuelling	Action plan of the fire brigade and safety	Similar to ordinary refuelling stations	Required, regardless of the governmental/

1 ICPE: Installation classée pour la protection de l'Environnement
2 Compressed natural gas regulations in Spain
3 Almacenamineto y utilización de botellas y botellones de gases comprimidos, licuados y disueltos a presión
4 Consideraciones básicas para la seguridad de los sistemas de hidrógeno

Approval requirements for HRS	Netherlands	France	Italy	Germany	Spain	USA
			stations	response plan		approval agency
Occupational safety	Not considered by authorities	Not considered		Considered	Not considered	Not considered
Spatial zoning (planning)	Applied, based on limit value for location-based risk	Safety distances inside and outside the HRS are applied according IPCE[5] law when more than 50 tons H_2 See comments in main text	Applied, ordinance for preferably CNG refuelling stations	Safety distances inside and outside the HRS are applied. Based upon …	Only safety distances outside the HRS are applied (the same for refuelling station)	Planning is done at the state or local government agency having jurisdiction
Permits required	1.Environm. 2. Building 3. Operating	Operating first and then construction	1.Building 2. Operating	Parallel Building and Operating permit	1.Environmental 2. Building (may be simultaneous)	Permitting is done at the state or local government level and in general, the following can be required: o Environmental (or air quality) o Building o Operating
Authorities involved	1. City Council 2.Environm. body 3.Fire Brigade 4. VROM Inspectorate	CODERST[6] 1. The local DRIRE under the supervision of the préfet of department. 2. Fire brigade	1. City Council 2.Environm. body 3. Local Health Service 4. Scientific Body Nat. Health Service 5.Fire Brigade	Different institutions per autonomous state. 1. Accredited supervisory board: Gewerbeaufsichts-amt responsible for administration, permission and prohibition 2.Authority for the protection of health of inhabitants and safety of workers:	1. Land owner 2. City Council 3. Industry Department of the Generalitat 4. Fire Brigade (optional)	1. Either state government, collaboratively involving state and local government or entirely local government. 2. Fire Marshall (either state or local) 3. Department of Environmental Quality (state level) 4. State Division of Code Enforcement 5. Air Resources Board (In California, state law, CARB is involved in the HRS process)
Coordination between all parties involved	+ , responsibility of competent authority	Formal commission of authorities involved (CODERST)	+, responsibility of city council	+ , agreement on discrepancies before starting the permitting procedure.	Responsibility of City Council	+ 1. establishment of government agencies to be involved (In most communities, there is coordination between the building code official and the fire marshal) 2. Determine requirements

5 ICPE: Installation Classée pour la Protection de l'Environnement

6 CODERST: Commission Départementale d'évaluation des Risques Sanitaires et Technologiques.

Approval requirements for HRS	Netherlands	France	Italy	Germany	Spain	USA
						for community relations efforts.
Required documents by authorities						
Drawing and lay-outs of buildings and surroundings	+	+	+	+ what is meant by certified?	+	+
(Reference Standards for and) List of plant components e.g. piping, fittings, vessels, materials, heat exchangers and machines		+	API standard 618 for reciprocating compressors	+	+	+
Declaration of installation of pressurized equipment		+			+	
Description of process + PFD's	+	+	+	+	+	+ technical review
Electrical design as well as grounding system lighting protection system			+ to be approved by Environmental Body		+	+ not in all states (typically, in accordance with NFPA 70)
impact study on environment in day to day use (gaseous and liquid emissions noise emissions, waste water, Soil contamination)	+	+	+ to be approved by Environmental Body		+	+ not in all states
Hazard identification study, (special attention for brittleness)	+	+ HAZOP: if storage capacity > 5 tons		Not always required	Not required	Hazardous materials issues (addressed as part of environmental assessments)
Quantitative Risk Assessment/ external safety study	+	+ safety report if storage capcacity > 1 ton or in case of production of hydrogen	_	Not always required.	_	Not required by authorities, however done by project developers on their own initiative
Listing of applicable Codes& Standards documents						+(on basis of codes, standards or regulations adopted by the AHJ)

Approval requirements for HRS	**Netherlands**	**France**	**Italy**	**Germany**	**Spain**	**USA**
ALARP principle applicable		+				
Operating instructions				+ [7]		+(on basis of codes, standards or regulations adopted by the AHJ)+ not in all states
Listing of measuring and control systems	+			+		+(on basis of codes, standards or regulations adopted by the AHJ)
Installation plan and utilities				+		+(on basis of codes, standards or regulations adopted by the AHJ)
Preventing and Mitigating safety measures e.g. Accessibility for emergency services Design of fire protection system Specification of water resources Safety precautions with LH_2 deliveries	+	+	+ fire prevention certificate	+ explosion and fire protection document	Required in handbook	++(on basis of codes, standards or regulations adopted by the AHJ)
Intervention measures in the event of abnormalities (shut-off procedures)	+	+		+ (locking plan)	Required in handbook	+(on basis of codes, standards or regulations adopted by the AHJ)+ not in all states
Checklist of required documents			+			
General guidelines used	Pressure equipment Directive 97/23/EC, Machine guideline 89/392/EC, Low voltage guideline 93/68/EC, EM compatibility guideline 89/336/EC, ATEX	Pressure equipment Directive 97/23/EC, Machine guideline 89/392/EC, Low voltage guideline 93/68/EC, EM compatibility guideline 89/336/EC, BAT[8]	Pressure equipment Directive 97/23/EC, Machine guideline 89/392/EC, Low voltage guideline 93/68/EC, EM compatibility guideline 89/336/EC, ATEX	Pressure equipment Directive 97/23/EC, Machine guideline 89/392/EC, Low voltage guideline 93/68/EC, EM compatibility guideline 89/336/EC, ATEX	Pressure equipment Directive 97/23/EC, Machine guideline 89/392/EC, Low voltage guideline 93/68/EC, EM compatibility guideline 89/336/EC, ATEX, BAT	+(on basis of codes, standards or regulations adopted by the AHJ)
Description and operating instructions				+ (used)		

[7] only after the successful proof of a safe operability the permission for operation of the HRS is given

[8] BAT : Best Available Technology

Approval requirements for HRS	Netherlands	France	Italy	Germany	Spain	USA
of the natural gas refuelling station						
Inspection	No specific protocol, general inspection techniques will apply	Clearly organised under the responsibility of the DRIRE. No specific frequency.	No specific protocol. General procedure for CNG refuelling station will apply	According BetrSichV every 5-years by Competent Safety Organisation, Tubes every half year by operators + manufacturers regulations. Also: 24 months after start-up and every three years.	No specific protocol , inspection regime to be set in accordance with the risk imposed	Whether or not to conduct inspections and inspection protocol used are determined by the local AHJ
Dissemination	Organisations would use the handbook if it would contain relevant information to problems such as: 1. What functions and buildings are allowed near HRS's? 2. Technical Standards 3. Intervention measures	Organisations would use the handbook if it would contain relevant information to particular problems. Dissemination through DDSC[9]	Organisations would use the handbook if it would contain information related to their field of responsibility. Formal recognition of the handbook by Italian authorities would greatly help its dissemination and acceptance.	Some interviewees answered that the use of the handbook will depend on it's legal status.	Organisations would use the handbook if it would contain relevant information to problems such as: 1. What functions and buildings are allowed near HRS's? 2. Technical Standards 3. Intervention measures	
GAPS	Be aware of importance of the local community and involve them in the permitting process.	Which accident scenario's are taken into account. Classification of risk based of the quantity of hydrogen stored on site, regardless pressure, type and location of tanks			Be aware of importance of the local community and involve them in the permitting process..	Be aware of importance of the local community and involve them in the permitting process.

[9] DDSC: Direction de la Défense et de la Sécurité Civile.