

ICHS

The International Conference on Hydrogen Safety (ICHS3) is jointly organised by IA HySafe and IEA HIA with the financial support of the Collectivité territoriale de Corse, the French Republic and European Union in the frame of the ERDF Programme 2007-2013.

The ICHS conference will focus on issues pertaining to the improvement, knowledge and understanding of hydrogen safety. It aims at providing a basis that will foster removal of safety-related barriers to implementation of hydrogen as an energy carrier.

THEMES AND TOPICS

Theme 1: Building Public Safety Consensus

- Historical Progress – Hydrogen as an Energy Carrier
- Progress in Closing Knowledge Gaps
- Portable, Mobile and Stationary Applications
- Safety knowledge Tools, Training and Education

Theme 2: Latest Advances in Hydrogen Safety R&D

- Modeling, Simulation and Validation
- Experimental Programs and Testing
- Sensors and Mitigation
- Materials Safety (hydrogen effects on materials, including fuel quality)
- Hydrogen behaviour (release, dispersion, ignition and autoignition, combustion : deflagration, detonation, Transitional effects)
- Physical effects (thermal, overpressure and missile effects from hydrogen fires and explosions).

Theme 3: Risk Management and Insurance

- Risk-informed / safety engineering
 - *Methods to reduce safety distances*
- Risk / safety perception
- Risk acceptance and harm criteria
- Risk assessment uncertainly, cost-benefit analysis and insurance premiums
- Hydrogen safety research in insurance industry
- Property insurance vs liability insurance
 - *Industrial, commercial and residential*
 - *3rd party liability*

CONFERENCE STRUCTURE

Platform for the presentation of the final results of project. Each day, the Conference will start with a plenary session on issues that are particularly relevant in contemporary society, such as technologies, infrastructure and public safety, research & development, risk management and insurance. The plenary session will be followed by parallel sessions featuring invited topical presentations and contributed papers.

CONFERENCE LANGUAGE

The conference language is English. No translation will be provided.



TRANSPORTATION AND ACCOMODATION

Please visit the official website :

www.ichs-3-ajaccio.com

COMMERCIAL CONTACT

Corsica Events

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3rd International Conference on Hydrogen Safety

jointly organized by IA HySafe and IEA-HIA

Palais des Congrès Ajaccio FRANCE

September 16-18 2009



ICHS

Time Slots	First Day: September 16, 2009	
9:00-9:30	Opening Session Welcome Message from CEA & UDC Introduction of the Conference by Manfred Wilms (FZJ) President of HYSAFE IA	
9:30-9:40	Plenary session - Theme 1: Hydrogen Energy Technologies and Infrastructure—Building Public Safety Consensus <i>Moderated by Jay Keller (Sandia Nat Lab)</i>	
9:40-10:00	Hydrogen: A Safe Energy Carrier—Historical Perspective Marianne Julien (Air Liquide)	
10:00-10:20	Safety R&D and Engineering—Recent Progress Highlights Antonio Ruiz (US-DOE)	
10:20-10:40	Hydrogen Safety — Fire Brigade Perspective on Hydrogen Energy Colonel Pierre Salines & Lt Colonel Bruno Mastracci (Corsica Fire Department)	
10:40-10:50	Introduction to the Topical Lectures Jay Keller (Sandia Nat Lab)	
10:50-11:10	Break	
11:10-11:40	Topical Lecture 1: Historical Progress – Hydrogen as an Energy Carrier Gonzalo Piernavieja Izquierdo (ITC)	
11:40-11:50	Closure and transfer to parallel session	
11:50-12:10	Session 1: Hydrogen RCS paper 207 A NATIONAL SET OF HYDROGEN CODES AND STANDARDS FOR THE US C. RIVKIN, C. BLAKE, R. BURGESS, W. BUTNER, M. POST	Session 2: Fuel Station safety paper 154 EXPERIMENTAL STUDIES ON WIND INFLUENCE ON HYDROGEN RELEASE FROM LOW PRESSURE PIPELINES N. MATTEI, M. SCHIAVETTI, M.N. CARCASSI
	paper 245 FROM RESEARCH RESULTS TO PUBLISHED CODES AND STANDARDS - ESTABLISHING CODE REQUIREMENTS FOR NFPA 55 BULK HYDROGEN SYSTEMS SEPARATION DISTANCES M.T. GRESHO	paper 251 TEMPERATURE CHANGE OF A TYPE IV CYLINDER DURING HYDROGEN FUELING PROCESS S. H. LEE,Y. G. KIM, S. C. KIM, K. B. YOON
12:10-12:30	paper 7 SAFETY CONSIDERATIONS AND APPROVAL PROCEDURES FOR THE INTEGRATION OF FUEL CELLS ON BOARD OF SHIPS F. VOGLER, G. WÜRSIG	paper 200 CONSEQUENCES OF CATASTROPHIC RELEASES OF IGNITED AND UNIGNITED HYDROGEN JET RELEASES M. ROYLE, D.B.WILLOUGHBY
12:50-1:00	Closure and transfer to Lunch	
1:00-2:00	Lunch	
2:00-2:30	Topical Lecture 2: Closing Knowledge Gaps in Hydrogen Safety Vladimir Mal'kov (Ukr. Ulfat)	
2:30-2:40	Closure and transfer to parallel session	
2:40-3:00	Session 3: Safety Knowledge paper 197 ACHIEVEMENTS OF THE EC NETWORK OF EXCELLENCE HYSAFE T. JORDAN and al.	Session 4: Confined Spaces 1 paper 232 ALLOWABLE HYDROGEN PERMEATION RATE FROM ROAD VEHICLE COMPRESSED GASEOUS STORAGE SYSTEMS IN GARAGES: PART 1 – INTRODUCTION, SCENARIOS, AND ESTIMATION OF AN ALLOWABLE PERMEATION RATE P. ADAMS, A. BENGHAOUER, B. CARITEAU, V. MOLKOV, A.G. VENETSANOS
	paper 204 INTEGRATION OF EXPERIMENTAL FACILITIES: A JOINT EFFORT FOR ESTABLISHING A COMMON KNOWLEDGE BASE IN EXPERIMENTAL WORK ON HYDROGEN SAFETY E.-A. REINECKE and al.	paper 219 ESTIMATION OF AN ALLOWABLE HYDROGEN PERMEATION RATE FROM ROAD VEHICLE COMPRESSED GASEOUS STORAGE SYSTEMS IN TYPICAL GARAGES: PART 2: CFD DISPERSION CALCULATIONS USING THE ADREA-HF CODE AND EXPERIMENTAL VALIDATION USING HELIUM TESTS AT THE GARAGE FACILITY A.G. VENETSANOS, E. PAPANIKOLAOU, B. CARITEAU, P. ADAMS, A. BENGHAOUER
3:20-3:40	paper 120 USING HYDROGEN SAFETY BEST PRACTICES AND LEARNING FROM SAFETY EVENTS S.C. WEINER, L.L. PASSBENDER, K.A. QUICK	paper 252 ESTIMATION OF AN ALLOWABLE HYDROGEN PERMEATION RATE FROM ROAD VEHICLE COMPRESSED GASEOUS HYDROGEN STORAGE SYSTEMS IN TYPICAL GARAGES: PART 3: MODELLING AND NUMERICAL SIMULATION OF HYDROGEN PERMEATION IN A GARAGE WITH ADIABATIC WALLS AND STILL AIR J.-B. SAFFERS, D. MAKAROV, A. V. MOLKOV
3:40-4:00	paper 153 SAFETY CONSIDERATIONS FOR HYDROGEN TEST CELLS T. WALLNER, R. SCARCELLI, H.R.A. LOHSE-BUSCH, B.M. WOZNY, S.A. MIERS	paper 173 EXPERIMENTS ON THE DISTRIBUTION OF CONCENTRATION DUE TO BUOYANT GAS LOW FLOW RATE RELEASE IN AN ENCLOSURE B. CARITEAU, J. BRINSTER, I. KTATSCHENKO
4:00-4:20	Break	
4:20-4:40	Session 5: System Safety paper 235 HYDROGEN AND FUEL CELL STATIONARY APPLICATIONS: KEY FINDINGS OF MODELLING AND EXPERIMENTAL WORK IN THE HYPER PROJECT S. BRENNAN and al.	Session 6: Confined Spaces 2 paper 180 EXPERIMENTAL RESULTS ON THE DISPERSION OF BUOYANT GAS IN A FULL SCALE GARAGE FROM A COMPLEX SOURCE B. CARITEAU, J. BRINSTER, I. KTATSCHENKO, E. STUDER, G. JONCQUET
	paper 241 HYTUNNEL PROJECT TO INVESTIGATE THE USE OF HYDROGEN VEHICLES IN ROAD TUNNELS S. KUMAR and al.	paper 233 EXPERIMENTAL STUDY OF HYDROGEN RELEASE ACCIDENTS IN A VEHICLE GARAGE E.G. MERILO, M.A. GROETHE, J.D. COOTON, S. CHIBA
5:00-5:20	paper 217 ON THE USE OF HYDROGEN IN CONFINED SPACES: RESULTS FROM THE INTERNAL PROJECT INSIDE A.G. VENETSANOS and al.	paper 118 HYPER EXPERIMENTS ON CATASTROPHIC HYDROGEN RELEASES INSIDE A FUEL CELL ENCLOSURE A. FRIEDRICH, N. KOTCHOURKO, G. STERN, A. VESER
5:20-5:40	Paper 183 HIGH PRESSURE PEM WATER ELECTROLYSIS AND CORRESPONDING SAFETY ISSUES V. FATEEV, S. GRIGORIEV, S. KOROBTSYEV, V. POREMBSKY, P. MILLET, F. AUPIRETE	paper 157 NATURAL AND FORCED VENTILATION STUDY IN AN ENCLOSURE HOSTING A FUEL CELL G. M. CERCHIARA, N. MATTEI, M. SCHIAVETTI, M. N. CARCASSI
05:50 -07:30	NATURALHY WORKSHOP	
07:30 -9:00	Welcome Cocktail from Ajaccio Municipality	

Exhibition Hall - Hall d'Exposition

Room Claude Papi - Salle Claude Papi

Auditorium

Restaurant

Time Slots	Second Day: September 17, 2009	
9:00-9:20	Plenary session - Theme 2: R&D Safety Issues «Latest Advances in Hydrogen Safety R&D», Thomas Jordan (FZK)	
9:20-9:50	Topical Lecture 3 : Advances in Modeling, Alexei KOTCHOURKO (FZK)	
9:50-10:00	Closure and transfer to parallel session	
10:00-10:20	session 7: Dispersion 1 Paper 115 VALIDATION OF CFD MODELLING OF LH2 SPREAD AND EVAPORATION AGAINST LARGE-SCALE SPILL EXPERIMENTS P. MIDDHA, M. ICHARD, B. J. ARNIZEN	session 8: Ignition 1 Paper 125 IGNITION ENERGY AND IGNITION PROBABILITY OF METHANE – HYDROGEN – AIR MIXTURES G. HANKINSON, H. MATHURKAR, B.J. LOWESMITH
	Paper 166 EXPERIMENTAL CHARACTERIZATION AND MODELING OF HELIUM DISPERSION IN A 1/4-SCALE TWO-CAR RESIDENTIAL GARAGE W.M. PITTS, J.C. YANG, M.G. FERNANDEZ, K. PRASAD	Paper 265 PHYSICS OF SPONTANEOUS IGNITION OF HIGH-PRESSURE HYDROGEN RELEASE AND TRANSITION TO JET FIRE M.V. BRAGIN, V.V. MOLKOV
10:20-10:40	Paper 168 IGNITABILITY LIMITS FOR COMBUSTION OF UNINTENDED HYDROGEN RELEASES: EXPERIMENTAL AND THEORETICAL RESULTS R.W. SCHEFER, G.H. EVANS, J. ZHANG, A.J. RUGGLES, R. GREIF	Paper 216 NUMERICAL STUDY ON SPONTANEOUS IGNITION OF PRESSURIZED HYDROGEN RELEASE THROUGH A LENGTH OF TUBE B.P. XU, J.X. WEN, V.H.Y. TAM
11:00-11:20	Break	
11:20-11:40	Session 9: Dispersion 2 Paper 198 HYDROGEN RELEASE AND ATMOSPHERIC DISPERSION: EXPERIMENTAL STUDIES AND COMPARISON WITH PARAMETRIC SIMULATIONS F. GANCI, A. CARPIGNANO, N. MATTEI, M.N. CARCASSI	Session 10: Ignition 2 paper 223 SIMULATION OF SHOCK-INITIATED IGNITION J. MELGUIZO-GAVILANES, N. REZAEEYAN, L. BAUWENS
	paper 226 COMPARISON OF TWO SIMPLIFIED MODELS PREDICTIONS WITH EXPERIMENTAL MEASUREMENTS FOR GAS RELEASE WITHIN AN ENCLOSURE S. BENTEBOULA, A. BENGHAOUER, B. CARITEAU	paper 195 A LAGRANGIAN REACTION-DIFFUSION MODEL FOR PREDICTING THE IGNITABILITY OF PRESSURIZED HYDROGEN RELEASES B.M. MAXWELL, M.I. RADULESCU
11:40-12:00	paper 230 VISUALISATION OF JET FIRES FROM HYDROGEN RELEASE L. DEIMLING, V. WEISER, A. BLANC, N. EISENREICH, G. BILLEB, A. KESSLER	paper 255 MECHANISM OF HIGH PRESSURE HYDROGEN AUTO-IGNITION WHEN SPUTTING INTO AIR E. YAMADA, N. KITABAYASHI, A.K. HAYASHI, N. TSUBOI
12:00-12:20	paper 248 NUMERICAL AND EXPERIMENTAL INVESTIGATION OF BUOYANT GAS RELEASE B. CHERNYAVSKY, T. C. WU, P. OSHKAI, N. DJILALI	paper 259 STATISTICAL ANALYSIS OF ELECTROSTATIC SPARK IGNITION OF LEAN H2-O2-AR MIXTURES S.P.M. BANE, J.E. SHEPHERD, E. KWON, A.C. DAY
12:20-12:40	Closure and transfer to Lunch	
12:40-12:50	Lunch	
12:50-1:50	Lunch	
1:50-2:30	Topical Lecture 4: Learning from experiments and Incidents, Stuart HAWKSWORTH (HSL) & Les SHIRVILL (SHELL)	
2:30-2:40	Closure and transfer to parallel session	
2:40-3:00	Session 11: Jet 1 paper 119 EFFECTS OF SURFACE ON THE FLAMMABLE EXTENT OF HYDROGEN JETS P. BÉNARD, A. HOURRI, B. ANGERS, A. TCHOUVELEV, V. AGRANAT	Session 12: Fire, Explosion 1 Paper 156 NUMERICAL SIMULATION OF THE LAMINAR HYDROGEN FLAME IN THE PRESENCE OF A QUENCHING MESH S. KUDRIAKOV, E. STUDER, C. BIN
	paper 220 CONSEQUENCE ASSESSMENT OF THE BBC HYDROGEN REFUELING STATION, USING THE ADREA-HF CODE E. PAPANIKOLAOU, A.G. VENETSANOS, M. SCHIAVETTI, A. MARANGON, M. CARCASSI, N. MARKATOS	paper 162 VENTED CONFINED EXPLOSIONS INVOLVING METHANE/HYDROGEN MIXTURES B. J. LOWESMITH, C. MUMBY, G. HANKINSON, J.S PUTTOCK
3:00-3:20	paper 239 HYDROGEN RELEASE FROM A HIGH-PRESSURE GH2 RESERVOIR IN CASE OF A SMALL LEAK J. XIAO, W. BREITUNG, J.R. TRAVIS	paper 176 VENTED EXPLOSION OVERPRESSURES FROM COMBUSTION OF HYDROGEN AND HYDRO-CARBON MIXTURES C.R. BAUWENS, J. CHAFFEE, S.B. DOROFEEV
3:20-3:40	Break Poster Session	
3:40-4:40	Session 13: Jet 2 paper 178 EXPERIMENTAL INVESTIGATION OF HYDROGEN JET FIRE MITIGATION BY BARRIER WALLS R. W. SCHEFER, W. G. HOUF, E. G. MERILO, M. A. GROETHE	Session 14: Fire, Explosion 2 paper 188 DETONABILITY OF BINARY H2 / CH4 -AIR MIXTURES O.BOZIER, R.SORIN, F.VIROT, R.ZITOUN, D.DESBORDES
4:40-5:00	paper 221 THE STRUCTURE AND FLAME PROPAGATION REGIMES IN TURBULENT HYDROGEN JETS A. VESER and al.	paper 163 EXPERIMENTAL STUDY OF HYDROGEN RELEASES COMBUSTION A.O. ALEKSANDROV and al.
5:00-5:20	paper 222 EXPERIMENTAL STUDY OF IGNITED UNSTEADY HYDROGEN JETS INTO AIR J. GRUNE, K. SEMPERT, M. KUZNETSOW ,W. BREITUNG	paper 212 NUMERICAL SIMULATION OF LARGE SCALE HYDROGEN DETONATION A. HEIDARI, S. FERRARIS, J. X. WEN, V.H.Y. TAM
5:20-5:40	paper 228 EVALUATION OF OPTICAL AND SPECTROSCOPIC EXPERIMENTS OF HYDROGEN JET FIRES A. BLANC, L. DEIMLING, N. EISENREICH, G. LANGER, A. KESSLER, V. WEISER	paper 214 HIGH PRESSURE HYDROGEN FIRES C. PROUST, D. JAMOIS, E. STUDER

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Time Slots	Third Day: September 18, 2009	
9:00-9:10	Plenary session – Theme 3 : Risk Management and Insurance Issues : Breaking barriers-paving pathways Introduction of the topic and panellists by Andrei Tchouvelev (AVI, Canada)	
9:10-9:40	Industry Perspective: Refuelling Station Insurance - Anne Marit Hansen, StatoilHydro, Norway Residential Fuel Cells Certification and Insurance - Sam Myashita, ENAA, Japan	
9:40-10:10	Insurance Company Perspective: Guy Vercauteren (FM Global, France) Bob Golden (Allianz Corporate Solutions)	
10:10-10:40	Panel discussion moderated by Sergey Dorofeev (FM Global, USA)	
10:40-11:00	Break	
11:00-11:30	Topical Lecture 5: Property insurance R&D and hydrogen - presented by Lou Gritz, FM Global, USA	
11:30-11:40	Closure and transfer to parallel session	
11:40-12:00	Session 15: Risk Management / Assessment 1 Paper 170 FOR A SUCCESSFUL ARRIVAL OF THE HYDROGEN ECONOMY IMPROVE NOW THE CONFIDENCE LEVEL OF RISK ASSESSMENTS! H. J. PASMAN	Session 16: Mitigation Paper 191 AN OVERVIEW OF HYDROGEN SAFETY SENSORS AND REQUIREMENTS W.J. BUTNER, M.B. POST, R. BURGESS, C. RIVKIN
	paper 159 DISCRETE EVENT SIMULATION IN SUPPORT TO HYDROGEN SUPPLY RELIABILITY I. KOZINE, F. MARKERT, A. ALAPETITE	paper 202 THE INTERACTION OF HYDROGEN JET RELEASES WITH WALLS AND BARRIERS D.B. WILLOUGHBY, M. ROYLE
12:00-12:20	paper 209 THE ROLE OF TRUST AND FAMILIARITY IN RISK COMMUNICATION R. ZIMMER, M. ZSCHIESCHE, N. HOLZINGER	paper 146 A STUDY OF BARRIER WALLS FOR MITIGATION OF UNINTENDED RELEASES OF HYDROGEN W.G. HOUF, G.H. EVANS, R.W. SCHEFER, E. MERILO, M. GROETHE
12:20-12:40	paper 155 PREDICTION OF THIRD PARTY DAMAGE FAILURE FREQUENCY FOR PIPELINES TRANSPORTING MIXTURES OF NATURAL GAS AND HYDROGEN L. ZHANG, R.A. ADEY	paper 114 CAN THE ADDITION OF HYDROGEN TO NATURAL GAS REDUCE THE EXPLOSION RISK ? P. MIDDHA, D. ENGEL, O. R. HANSEN
12:40-1:00	Closure and transfer to Lunch	
1:00-1:10	Lunch	
1:10-2:10	Lunch	
2:10-2:40	Topical Lecture 6: Uniform Risk Acceptance and Harm Criteria - IEA HIA Task 19 Perspective - presented by Jeff LaChance, SNL, USA	
2:40-2:50	Closure and transfer to parallel session	
2:50-3:10	Session 17: Risk Management/Assessment2 Paper 246 BENCHMARK EXERCISE ON RISK ASSESSMENT METHODS APPLIED TO A VIRTUAL HYDROGEN REFUELLING STATION K. HAM and al.	Session 18: Materials Safety Paper 152 ENVIRONMENTAL REACTIVITY OF SOLID STATE HYDRIDE MATERIALS J. R. GRAY, D. L. ANTON
	paper 184 RISK MODELLING OF A HYDROGEN REFUELLING STATION USING A BAYESIAN NETWORK G.P. HAUGOM, P. FRIIS HANSEN, E. HÅLAND	paper 149 EFFECTS OF PURITY AND PRESSURE ON THE HYDROGEN EMBRITTLEMENT OF STEELS AND OTHER METALLIC MATERIALS H. BARTHÉLÉMY
3:10-3:30	paper 150 RISK QUANTIFICATION OF HYDRIDE BASED HYDROGEN STORAGE SYSTEMS FOR AUTOMOTIVE APPLICATIONS Y. F. KHALIL, D. A. MOSHER	paper 236 MEASUREMENT OF FATIGUE CRACK GROWTH RATES FOR STEELS IN HYDROGEN CONTAINMENT COMPONENTS B.P. SOMERDAY, K.A. NIBUR, C. SAN MARCHI
3:30-3:50	paper 121 PREDICTIONS OF SOLID-STATE HYDROGEN STORAGE SYSTEM CONTAMINATION PROCESSES D.E. DEDRICK, M.P. KANOUFF, R.S. LARSON, R.W. BRADSHAW, J. GRAETZ, S. HWANG	paper 179 INFLUENCE OF TEMPERATURE ON THE FATIGUE STRENGTH OF COMPRESSED HYDROGEN TANKS FOR VEHICLES J. TOMIOKA, K. KIGUCHI, Y.TAMURA, H. MITSUISHI
3:50-4:10	Closure and transfer to closing session	
4:10-4:20	Closing Session Synthesis of the conference by Jim Ohi, Thomas Jordan, Sergey Dorofeev Hydrogen Safety Perspective : IEA HIA vision by Bill Hoagland, HYSAFE IA vision by Manfred Wilms Conclusion/Debate	
4:20-5:00	GALA DINNER	
5:00-10:30	GALA DINNER	

