3rd International Conference on Hydrogen Safety

ICHS

Palais des Congrès Ajaccio - FRANCE
16-18 September 2009
http://conference.ing.unipi.it/ichs2009/

SCIENTIFIC PROGRAM

With the endorsment of:

In association with:

HYDROGEN IMPLEMENTING AGREEMENT

ICHS

Over 250 participants awaited for this 3 days international conference

More than 100 papers submitted for oral and poster presentations

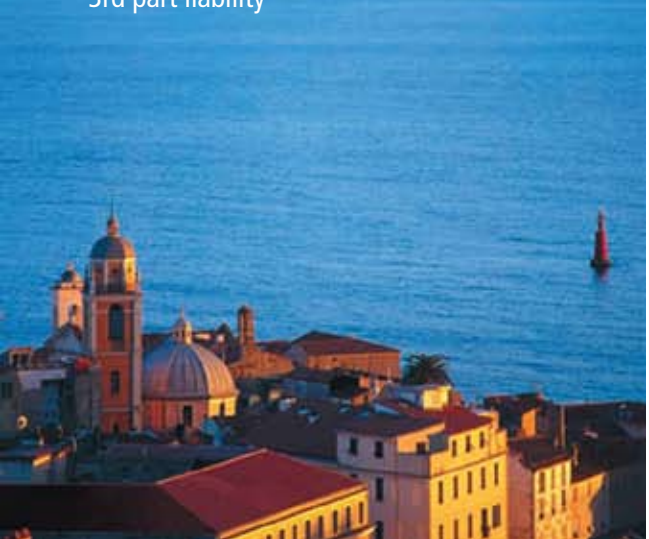
Exhibition opportunities

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 part liability



IAHySafe

The International Association for Hydrogen Safety HySafe (founded in February 2009) is organizing this event in collaboration with the principal European and international projects and organizations involved in hydrogen safety.

ICHS

ICHS forms part of the International Association HySafe activity program. 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 barriersto implementation of hydrogen as an energy carrier.

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.

ICHS

Congress registration

Category	ADVANCE PRICE (before July 1st)	LATE PRICE (after July 1st)	INCLUDES
A Attendant	550 €	600 €	Conference proceedings + conference program + coffee breaks + 3 lunches + 1 gala dinner
B Student	250 €	300 €	Conference proceedings + conference program + coffee breaks Lunches and Gala dinner excluded
C Extra ticket for Gala Dinner	100 €	100 €	Only gala dinner
D Extra ticket for lunch	35 €	35 €	1 Ticket per lunch
E Extra copy of proceedings	30 €	30 €	Proceedings

VAT 19.6% included

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PLENARY SESSIONS

- **1st Plenary Session:**

Hydrogen Energy Technologies and Infrastructure - Building Public Safety Consensus
Opening comments: focus and structure of Plenary
Jay Keller - Sandia National Laboratories

Hydrogen: A Safe Energy Carrier - Historical Perspective
TBD
Safety R&D and Engineering - Recent Progress Highlights
Antonio Ruiz - US-DOE
Hydrogen Safety - Local Perspective on Public Acceptance
TBD
Summary, Topical Lectures to follow
Jay Keller - Sandia National Laboratories

- **2nd Plenary Session:**

R&D Safety Issues - Latest Advances in Hydrogen Safety R&D
Thomas Jordan – FZK / HySafe

- **3rd Plenary Session:**

Risk Management and Insurance (breaking barriers/paving pathways)
Andrei Tchouvelev - AVT, Canada and Sergey Dorofeev - FM Global, USA
Introduction of the topic and panellists by the Moderator (A. Tchouvelev)
Industry Prospective
Case Study 1: Refuelling Station Insurance – Anne Marit Hansen, StatoilHydro, Norway
Case Study 2: Residential Fuel Cells Insurance – Sam Myashita, ENAA, Japan
Insurance Prospective
Case Study 3: Property insurance experience - TBD, FM Global, USA
Case Study 4: Non property insurance experience - Allianz Risk Transfer (TBD)
Interactive panel discussion
moderated by Sergey Dorofeev

TOPICAL LECTURE

Topical Lecture 1
Historical Progress - Hydrogen as an Energy Carrier
Gonzalvo Piernavieja TBC

Topical Lecture 2
Closing the Knowledge Gap
Vladimir Molkov - University of Ulster

Topical Lecture 3
Modeling
Alexei Kotchourko - Karlsruhe Institute of Technology

Topical Lecture 4
Experiment Tools
Stuart Hawksworth - Healt and Safety Lab., Buxton

Topical Lecture 5
Property insurance R&D and Hydrogen
Lou Ritz - FM Global, USA

Topical Lecture 6
Uniform Risk Acceptance and Harm Criteria
Jeff LaChance - SNL, USA

THEMATIC SESSIONS
List of articles accepted

Session Hydrogen RCS

- Hennessey, N. Weyandt, STATUS OF THE NHTSA'S HYDROGEN AND FUEL CELL VEHICLE SAFETY RESEARCH PROGRAM
- C. Rivkin, C. Blake, R. Burgess, W. Buttner, M. Post, A NATIONAL SET OF HYDROGEN CODES AND STANDARDS FOR THE US
- M. Gresho, FROM RESEARCH RESULTS TO PUBLISHED CODES AND STANDARDS - ESTABLISHING CODE REQUIREMENTS FOR NFPA 55 BULK HYDROGEN SYSTEMS SEPARATION DISTANCES

Session Fuel Station safety

- N. Mattei, M. Carcassi, M. Schiavetti, EXPERIMENTAL STUDIES ON WIND INFLUENCE ON HYDROGEN RELEASE FROM LOW PRESSURE PIPELINES
- M. Royle, D. Willoughby, CONSEQUENCES OF CATASTROPHIC RELEASES OF IGNITED AND UNIGNITED HYDROGEN JET RELEASES
- K. B. Yoon, S.H. Lee, Y.G. Kim, S.C. Kim, TEMPERATURE CHANGE OF A TYPE IV CYLINDER DURING HYDROGEN FUELING PROCESS
- M. Heitsch, P. Moretto, D. Baraldi, SIMULATION OF THE FAST FILLING OF HYDROGEN TANKS

Session Safety Knowledge

- S. Weiner, L. Fassbender, K. Quick, USING HYDROGEN SAFETY BEST PRACTICES AND LEARNING FROM SAFETY EVENTS
- T. Wallner, R. Scarcelli , H. R. A. Lohse-Busch, B. M. Wozny, S.A. Miers, SAFETY CONSIDERATIONS FOR HYDROGEN TEST CELLS
- T. Jordan, P. Adams, I. Azkarate, D. Baraldi, A. Vetere, H. Barthelemy, L. Bauwens, A. Bengaouer, P. Serre-Combe, S. Brennan, A. Dahoe, D. Makarov, V. Molkov, M. Carcassi, A. Marangon, N. Eisenreich, A. Kessler, G. Langer, A. Engebø, E. Funnemark, E. Haland, G.P. Haugom, E. Gallego, A. Gavrikov, N. Zaretskiy, A.M. Hansen, S. Nielsen, O. Jedicke, A. Kotchourko, S. Kumar, F. Markert, P. Middha, L. Perrette, D. Tigreat, E. Reinecke. K. Verfondern, M. Wilms, U. Schmidten, M. Stöcklin, A. Sully, A. Teodorczyk, A. Venetsanos, N. Versloot, ACHIEVEMENTS OF THE EC NETWORK OF EXCELLENCE HYSAFE
- E. A. Reinecke, Th. Huebert, I. Tkatschenko, A. Kessler, M. Kuznetsov, B.A. Wilkins, D. Hedley, I. Azkarate, C. Proust, B. Acosta-Iborra, A. Gavrikov, N. Versloot, A. Marangon, A. Teodorczyk, F. Grafwallner, INTEGRATION OF EXPERIMENTAL FACILITIES: A JOINT EFFORT FOR ESTABLISHING A COMMON KNOWLEDGE BASE IN EXPERIMENTAL WORK ON HYDROGEN SAFETY

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List of articles accepted

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- B. Cariteau, J. Brinster, I. Tkatschenko, EXPERIMENTS ON THE DISTRIBUTION OF CONCENTRATION DUE TO BUOYANT GAS LOW FLOW RATE RELEASE IN AN ENCLOSURE
- A. Venetsanos, E. Papanikolaou, B. Cariteau, P. Adams, A. Bengaouer, ESTIMATION OF AN ALLOWABLE HYDROGEN PERMEATION RATE FROM ROAD VEHICKE COMPRESSED GASEOUS HYDROGEN 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
- P. Adams, A. Bengaouer, B. Cariteau, V. Molkov, A. Venetsanos, ALLOWABLE HYDROGEN PERMEATION RATE FROM ROAD VEHICLE COMPRESSED GASEOUS STORAGE SYSTEMS IN GARAGES:
PART 1: INTRODUCTION, SCENARIOS, AND ESTIMATION OF AN ALLOWABLE PERMEATION RATE
- J. B. Saffers, D. Makarov, V. Molkov, 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
- A. Venetsanos, P. Adams, I. Azkarate, A. Bengaouer, L. Brett, M. Carcassi, A. Engebo, E Gallego, A. Gavrikov, O.R. Hansen, S. Hawksworth, T. Jordan, A. Kessler, S. Kumar, V. Molkov, S. Nilsen, E. Reinecke, M. Stöcklin, U. Schmidtchen, A. Teodorczyk, D. Tigreat, N. Versloot, ON THE USE OF HYDROGEN IN CONFINED SPACES: RESULTS FROM THE INTERNAL PROJECT INSHYDE
- S. Brennan, A. Bengaouer, S. Kudriakov, C. Pitre, M. Carcassi, G. Cerchiara, G. Evans, W. Houf, R. Schefer, A. Friedrich, N. Kotchourko, G. Stern, A. Veser, O. Gentilhomme, A. Kotchourko, J. Yanez, D. Makarov, V. Molkov, E. Papanikolau, A. Venetsanos, M. Royle, D. Willoughby, HYDROGEN AND FUEL CELL STATIONARY APPLICATIONS: KEY FINDINGS OF MODELLING AND EXPERIMENTAL WORK IN THE HYPER PROJECT
- S. Grigoriev, V. Fateev, S. Korobtsev, V. Porembskiy, P. Millet, F. Auprêtre, HIGH PRESSURE PEM WATER ELECTROLYSIS AND CORRESPONDING SAFETY ISSUES
- S. Kumar, S. Miles, P. Adams, A. Kotchourko, D. Hedley, P. Middha, V. Molkov, A. Teodorczyk, M. Zenner, HYTUNNEL PROJECT TO INVESTIGATE THE USE OF HYDROGEN VEHICLES IN ROAD TUNNELS
- F. Vogler, G-M Würsing, SAFETY CONSIDERATIONS AND APPROVAL PROCEDURES FOR THE INTEGRATION OF FUEL CELLS ON BOARD OF SHIPS
- E. Merilo, M. Groethe, J. Colton, S. Chiba, EXPERIMENTAL STUDY OF HYDROGEN RELEASE ACCIDENTS IN A VEHICLE GARAGE
- A. Friedrich, N. Kotchourko, G. Stern, A. Veser, HYPER EXPERIMENTS ON CATASTROPHIC HYDROGEN RELEASES INSIDE A FUEL CELL ENCLOSURE
- B. Cariteau, J. Brinster, E. Studer, I. Tkatschenko, G. Joncquet, EXPERIMENTAL RESULTS ON THE DISPERSION OF BUOYANT GAS IN A FULL SCALE GARAGE FROM A COMPLEX SOURCE
- G. Cerchiara, M. Carcassi, N. Mattei, M. Schiavetti, NATURAL AND FORCED VENTILATION STUDY IN AN ENCLOSURE HOSTING A FUELL CELL

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- R. Schefer, G. Evans, J. Zhang, A. Ruggles, R. Greif, IGNITABI8LITY LIMITS FOR COMBUSTION OF UNINTENDED HYDROGEN RELEASES: EXPERIMENTAL AND THEORETICAL RESULTS
- P. Middha, M. Ichard, B. Arntzen, VALIDATION OF CFD MODELLING OF LH2 SPREAD AND EVAPORATION AGAINST LARGE-SCALE SPILL EXPERIMENTS
- W. Pitts, K. Prasad, J. Yang, M. Fernandez, EXPERIMENTAL CHARACTERIZATION AND MODELING OF HELIUM DISPERSION IN A ¼ SCALE TWO-CAR RESIDENTIAL GARAGE
- E. Studer, S. Kudriakov, S. Jallais, V. Blanchetière, J. Hebrard, G. Leroy, BENCHMARK EXERCISES RELATED TO THE SAFETY ANALYSIS OF HYDROGEN / NATURAL GAS MIXTURES TRANSMISSION IN PIPELINES
- A. Venetsanos, E. Papanikolaou, J.G. Bartzis, THE ADREA-HF CFD CODE FOR CONSEQUENCE ASSESSMENT OF HYDROGEN APPLICATIONS
- O. K. Sommersel, D. Bjerketvedt, NUMERICAL SIMULATIONS OF A LARGE HYDROGEN RELEASE IN A PROCESS PLANT
- E. Papanikolau, A. Venetsanos, D. Baraldi, M. Heitsch, A. Huser, J. Pujol, D. Makarov, V. Molkov, J. Garcia, N. Markatos, HYSAFE SBEP-V20: NUMERICAL PREDICTIONS OF RELEASE EXPERIMENTS INSIDE A RESIDENTIAL GARAGE WITH PASSIVE VENTILATION
- S. Korobtsev, V. Denisenko, I. Kirillov, I. Nikolaev, HYDROGEN-AIR EXPLOSIVE ENVELOPE BEHAVIOR IN CONFINED SPACE AT DIFFERENT LEAK VELOCITIES
- A. Venetsanos, E. Papanikolaou, G.M. Cerchiara, M. Carcassi, N. Markatos, CFD SIMULATIONS ON SMALL HYDROGEN RELEASES INSIDE A VENTILATED FACILITY AND ASSESSMENT OF VENTILATION EFFICIENCY
- J. Zheng, H. Bie, P, Xu, Y. Liu, H. Chen. Y.Z. Zhao, NUMERICAL SIMULATION OF HYDROGEN RELEASE FROM HIGH-PRESSURE STORAGE VESSEL
- E. Deri, M. Bucci, M. Turin, A. Monavon, SOME CONSIDERATIONS ON THE SCALING OF EXPERIMENTS FOR HYDROGEN RISK ASSESSMENT
- R. Khaksarfard, M. Paraschivoiu, NUMERICAL INVESTIGATION OF HYDROGEN DISPERSION INTO AIR
- A. Venetsanos, E. Papanikolaou, O.R. Hansen, P. Middha, J. Garcia, E. Gallego, M. Heitsch, D. Baraldi, P. Adams, HYSAFE STANDARD BENCHMARK PROBLEM SBEP-V11: PREDICTIONS OF HYDROGEN RELEASE AND DISPERSION FROM A CGH2 BUS IN AN UNDERPASS
- S. Benteboula, A. Bengaouer, B. Cariteau, COMPARISON OF TWO SIMPLIFIED MODELS PREDICTIONS WITH EXPERIMENTAL MEASUREMENTS FOR GAS RELEASE WITHIN AN ENCLOSURE
- N. Djlali, T.C. Wu, P. Oshkai, B. Chernyavsky, NUMERICAL AND EXPERIMENTAL INVESTIGATION OF BUOYANT GAS RELEASE
- F. Ganci, A. Carpignano, M. Carcassi, N. Mattei, HYDROGEN RELEASE AND ATMOSPHERIC DISPERSION: EXPERIMENTAL STUDIES AND COMPARISON WITH PARAMETRIC SIMULATIONS
- L. Deimling, V. Weiser, A. Blanc, N. Eisenreich, G. Billeb, A. Kessler, CHARACTERISATION OF HYDROGEN RELEASE TESTS

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- G. Hankinson, H. Mathurkar, B. Lowesmith, IGNITION ENERGY AND IGNITION PROBABILITY OF METHANE-HYDROGEN-AIR MIXTURES
- S. Désilets, S. Côté, A. Tchouvelev, G. Nadeau, IGNITION EXPERIMENTS OF HYDROGEN MIXTURES BY DIFFERENT METHODS AND DESCRIPTION OF THE DRDC TEST FACILITIES
- B. Maxwell, M. Radulescu, A LAGRANGIAN REACTION-DIFFUSION MODEL FOR PREDICTING THE IGNITABILITY OF PRESSURIZED HYDROGEN RELEASES
- L. Bawens, J.M. Gavilanes, N. Rezaeyan, SIMULATION OF SHOCK-INITIATED IGNITION
- S. Bane, J. Shepherd, E. Kwon, A. Day, STATISTICAL ANALYSIS OF ELECTROSTATIC SPARK IGNITION OF LEAN H2-O2-AR MIXTURES
- A. K. Hayashi, E. Yamada, N. Kitabayashi, N. Tsuboi, MECHANISM OF HIGH PRESSURE HYDROGEN AUTO-IGNITION WHEN SPOUTING INTO AIR
- V. Golub, I. Laskin, D. Lenkevich, N. Semin, V. Volodin, HYDROGEN SELF-IGNITION IN PRESSURE RELIEF DEVICES

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- J. Xiao, J. Travis, W. Breitung, HYDROGEN RELEASE FROM A HIGH-PRESSURE GH2 RESERVOIR IN CASE OF A SMALL LEAK
- P. Bénard, A. Hourri, B. Angers, A. Tchouvelev, V. Agranat, EFFECTS OF SURFACE ON THE FLAMMABLE EXTENT OF HYDROGEN JETS
- W. Winters, W. Houf, SIMULATION OF SMALL-SCALE RELEASES FROM LIQUID HYDROGEN STORAGE SYSTEMS
- S. Benteboula, E. Studer, INTEGRAL MODELS FOR HIGH PRESSURE HYDROGEN-METHANE RELEASES
- S. Désilets, S. Côté, P. Bénard, A. Tchouvelev, G. Nadeau, EXPERIMENTAL RESULTS AND COMPARISON WITH SIMULATED DATA OF A LOW PRESSURE HYDROGEN JET
- J. Grune, K. Sempert, M. Kuznetsow, W. Breitung, EXPERIMENTAL STUDY OF IGNITED UNSTEADY HYDROGEN JETS INTO AIR
- R. Schefer, E. Merilo, M. Groethe, W. Houf, EXPERIMENTAL INVESTIGATION OF HYDROGEN JET FIRE MITIGATION BY BARRIER WALLS
- M. Kuznetsov, A. Veser, A. Fridrich, N. Kotchourko, G. Stern, G. Fast, M. Schwall, W. Breitung, THE STRUCTURE AND FLAME PROPAGATION REGIMES IN TURBULENT HYDROGEN JETS
- A Blanc, L. Deimling, N. Eisenreich, G. Langer, A. Kessler, V. Weiser, EVALUATION OF OPTICAL AND SPECTROSCOPIC EXPERIMENTS OF HYDROGEN JET FIRES

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- S. Kudriakov. B. Chen, E. Studer, NUMERICAL SIMULATION OF THE LAMINAR HYDROGEN FLAME IN THE PRESENCE OF A QUENCHING MESH
- B. Lowesmith, C. Mumby, G. Hankinson, J. Puttock, VENTED CONFINED EXPLOSIONS INVOLVING METHANE/HYDROGEN MIXTURES
- J-A. Coralie, A. Beccantini, S. Kudriakov, UNSTEADY LUMPED-PARAMETER MODELLING OF HYDROGEN COMBUSTION IN THE PRESENCE OF A WATER SPRAY
- Y. Skob, M. Ugryumov, K. Korobchynski, E. Granovskyy, V. Lyfar, NUMERICAL MODELING OF HYDROGEN FIRE DYNAMICS IN ENCLOSED SPACE
- D. Makarov, F. Verbecke, V. Molkov, A. Kotchourko, A. Lelyakin, J. Yanez, D. Baraldi, M. Heitsch, A. Efimenko, A. Gavrikov, AN INTERCOMPARISON OF CFD MODELS TO PREDICT LEAN AND NON-UNIFORM HYDROGEN MIXTURE EXPLOSIONS
- Y. Wu, M. Hamid, ASSESSMENT OF THE EFFECTS OF INERT GAS AND HYDROCARBON FUEL DILUTION ON HYDROGEN FLAMES
- J. Wen, A. Heidari, S. Ferraris, V. Tam, NUMERICAL SIMULATION OF LARGE SCALE HYDROGEN DETONATION
- O. Bozier, R. Sorin, R.Zitoun, D. Desbordes, DETONABILITY OF BINARY H2/CH4 - AIR MIXTURE
- A. Gavrikov, A. Aleksandrov, V. Alekseev, E. Chernenko, A. Efimenko, A. Mairov, I. Matsukov, N. Shepetov, S. Velmakin, N. Zaretskiy, EXPERIMENTAL STUDY OF HYDROGEN RELEASES COMBUSTION
- C. Proust, D. Jamois, E. Studer, HIGH PRESSURE HYDROGEN FIRES
- V. Petukhov, I. Naboko, N. Bublik, P. Gusev, O. Solntsev, S. Onufriev, L. Gutkin, EXPERIMENTAL SIMULATION OF EXPLOSION WAVE PROPAGATION IN HYDROGEN-AIR-MIXTURES OF VARIABLE COMPOSITION
- I. Zaev, I.A. Kirillov, IMPROVEMENTS IN TWO-STEP MODEL OF HYDROGEN DETONATIVE COMBUSTION: MODEL DESCRIPTION AND SENSITIVITY TO ITS PARAMETERS
- J. Wen, V. Madhav Rao, V. Tam, NUMERICAL STUDY OF HYDROGEN EXPLOSIONS IN A VEHICLE REFILL ENVIRONMENT
- L. Melani, I. Sochet, X. Rocourt, S. Jallais, REVIEW OF METHODS TO ESTIMATE THE OVERPRESSURE AND IMPULSE RESULTING FROM HYDROGEN EXPLOSION IN A CONFINED/OBSTRUCTED VOLUME
- A. Kotchourko, J. Yanez, A. Lelyakin, A. Gavrikov, A. Efimenko, M. Zbikowski, D. Makarov, V. Molkov, AN INTER-COMPARISON EXERCISE ON THE CFD DETONATION SIMULATION IN LARGE SCALE CONFINED VOLUMES

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- L. Zhang, R. Adey, PREDICTION OF THIRD PARTY DAMAGE FAILURE FREQUENCY FOR PIPELINES TRANSPORTING MIXTURES OF NATURAL GAS AND HYDROGEN
- H. J. Pasman, FOR A SUCCESSFUL ARRIVAL OF THE HYDROGEN ECONOMY IMPROVE NOW THE CONFIDENCE LEVEL OF RISK ASSESSMENTS!
- I. Kozine, F. Markert, A. Alapetite, DISCRETE EVENT SIMULATION IN SUPPORT TO HYDROGEN SUPPLY RELIABILITY
- F. Markert, A. Engebø, S. Nilsen, A BARRIER ANALYSIS OF A GENERIC HYDROGEN REFUELLING STATION
- D. Dedrick, M. Kanouff, R. Larson, R. Bradshaw, J. Graetz, S. Hwang, PREDICTIONS OF SOLID-STATE HYDROGEN STORAGE SYSTEM CONTAMINATION PROCESSES
- D. Mosher, Y. (Jhon) Khalil, RISK QUANTIFICATION OF HYDRIDE BASED HYDROGEN STORAGE SYSTEMS FOR AUTOMOTIVE APPLICATIONS
- K. Ham, A. Marangon, M. Carcassi, P. Middha, N. Versloot, BENCHMARK EXERCISE ON QUANTITATIVE RISK ASSESSMENT METHODOLOGIES APPLIED TO A VIRTUAL HYDROGEN REFUELLING STATION
- G. P. Haugom, P.Friis Hansen, E. Håland, RISK MODELLING OF A HYDROGEN REFUELLING STATION USING A BAYESIAN NETWORK
- V. Shepelin, D. Koshmanov, N. Efimova, SAFE TESTING OF CATALYTIC DEVICES IN HYDROGEN-AIR-FLOW
- A. Rodionov, H. Wilkening, P. Moretto, RISK ASSESSMENT OF HYDROGEN EXPLOSION FOR PRIVATE CAR WITH HYDROGEN-DRIVEN ENGINE
- J. Lachance, A. Tchouvelev, A. Engebø, DEVELOPMENT OF UNIFORM HARM CRITERIA FOR USE IN QUANTITATIVE RISK ANALYSIS OF THE HYDROGEN INFRASTRUCTURE

Session Mitigation

- W. Houf, G. Evans, R. Schefer, E. Merilo, M. Groethe, A STUDY OF BARRIER WALLS FOR MITIGATION OF UNINTENDED RELEASES OF HYDROGEN
- W. Buttner, M. Post, C. Rivkin, R. Burgess, AN OVERVIEW OF HYDROGEN SAFETY SENSORS AND REQUIREMENTS
- D. Willoughby, M. Royle, THE INTERACTION OF HYDROGEN JET RELEASES WITH WALLS AND BARRIERS
- P. Middha, D. Engel, O. Hansen, CAN THE ADDITION OF HYDROGEN TO NATURAL GAS REDUCE THE EXPLOSION RISK?
- V. Shepelin, D. Koshmanov, E. Chepelin, CATALYSTS FOR HYDROGEN REMOVAL: KINETIC PARADOX AND FUNCTIONING AT HIGH CONCENTRATION OF HYDROGEN
- R. Zalosh, N. Barilo, WIDE AREA AND DISTRIBUTED HYDROGEN SENSORS
- I. Kirillov, PERFORMANCE-BASED REQUIREMENTS FOR HYDROGEN DETECTION ALLOCATION AND ACTUATION
- J. Capelle, J. Gilgert, G. Pluvinage, DEFECT ASSESSMENT ON PIPE USED FOR TRANSPORT OF MIXTURE OF HYDROGEN AND NATURAL GAS

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- H. Barthelemy, EFFECTS OF PURITY AND PRESSURE ON THE HYDROGEN EMBRITLLEMENT OF STEELS AND OTHER METALLIC MATERIALS
- J. Tomioka, K. Kiguchi, Y. Tamura, H. Mitsuishi, INFLUENCE OF TEMPERATURE ON THE FATIGUE STRENGTH OF COMPRESSED HYDROGEN TANKS FOR VEHICLES
- B. Somerday, C.S. Marchi, K. Nibur, MEASUREMENT OF FATIGUE CRACK GROWTH RATES FOR STEELS IN HYDROGEN CONTAINMENT COMPONENTS
- C. James, D. Anton , D. Tamburello, K. Brinkman, J. Gray, B. Hardy, MODELING OF 2LiBH4+MgH2 HYDROGEN STORAGE SYSTEM ACCIDENT SCENARIOS USING EMPIRICAL AND THEORETICAL THERMODYNAMICS
- K. Holtappels, M. Beckmann-Kluge, M. Gebauer, M. Grüneberg, D. Eliezer, HYDROGEN STORAGE IN GLASS CAPILLARY ARRAYS FOR PORTABLE AND MOBILE SYSTEMS
- J. Capelle, J. Gilgert, G. Pluvinage, HYDROGEN EFFECT ON FATIGUE AND FRACTURE OF PIPE STEELS

Closing Session

- W. Hoagland, THE INTERNATIONAL ENERGY AGENCY HYDROGEN IMPLEMETING AGREEMENT TASK ON HYDROGEN SAFETY

ICHS

Conference location

Ajaccio is a well known tourist destination;
Corsica is the fourth largest island of the Mediterranean Sea; the island's pleasant climate, beautiful mountains and breathtaking coastlines make it a popular destination among the French and other Western Europeans. Corsica is active in the development of CO2 free technologies through scientific research, education and demonstration platforms for solar and hydrogen technologies. Ajaccio's international airport allows direct flights from London, Brussels, Geneva, Amsterdam and from all major French airports. Corsica can also be reached by ferries from France or Italy.

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