PROGRAM

6th International Conference on Hydrogen Safety

ICHS2015

October 19-21, 2015 -Yokohama (Japan)

"Policies and Initiatives in Transitioning to a Hydrogen Society"

Technova|Inc.

hySafe
INTERNATIONAL ASSOCIATION FOR HYDROGEN SAFETY

Time	Monday, October 19, 2015 Room Nichirin I - Room Nichirin II - Room Nichirin III - Room Nichirin IV
8:00	Registration Open
	Nichirin II+III **ICHS2015 Opening Session: Policies and Initiatives Towards Transitioning to Hydrogen Society** Chair: Akiteru Maruta, Local Host
9:00	**Welcome remarks** Andrei Tchouvelev, President IA HySafe Ken-ichiro Ota, Chair of ICHS2015 Yokohama Organizing Committee
9:10	**METI, Director of the FC Office** **Hydrogen and Fuel Cell Promotion Office, Ministry of Economy, Trade and Industry**
9:30	**Kanagawa Prefecture**
9:45	**City of Yokohama**
10:00	**European Commission** Marc Steen
10:20	**US DOE** Will James / Jay Keller
10:40	**IEA HIA** Trygve U. Riis, former HIA Chair
11:00	**NOW Germany** Thorsten Herbert
11:20	Break
	Government Safety Programs Chair: Andrei Tchouvelev
11:40	**HySafe Priorities** Jay Keller / Marc Steen, IA HySafe / IPHE RCSWG
12:00	**Japan Overview** NEDO
12:20	**FCH 2 -JU** Bert De Colvenaer
12:40	**South Africa Overview** Brian North
13:00	**US DOE SCS Overview** Will James / Jay Keller
13:20	Lunch

	Nichirin I	Nichirin II+III	Nichirin IV
	Education, training, lessons learned and best practices Chair: Dimitri Makarov	**Regulations Codes and Standard (RCS)** Chair: Jay Keller	**Behavior - Detonations** Chair: Sergey Dorofeev
14:20	**ID147, Safe operation of combined cycle gas turbine and gas engine systems using hydrogen rich fuels** Stuart Hawksworth, Keith Moodie, John Gummer, et.al.	**ID003, The Role of Standardization in the Global Deployment of Alternative Fueling Infrastructure (round table discussion)** ISO/TC197, EU AFI Directive and CEN, US DOE, NEDO, Q&A	**ID141, Development of a model evaluation protocol for CFD analysis of hydrogen safety issues – the SUSANA project** Daniele Baraldi, Daniele Melideo, Alexei Kotchourko, et.al.
15:00	**ID132, First responder training supporting commercialization of hydrogen and fuel cell technologies** Nick Barilo, Jennifer Hamilton, Steven C. Weiner	**ID109, Comparative study of regulations, codes and standards and practices on hydrogen fuelling stations** Sylvaine Pique, Benno Weinberger, Bruno Debray, et.al.	**ID178, Experimental determination of critical conditions for hydrogen-air detonation propagation in partially confined geometry** Wojciech Rudy, Karolina Dziubanii, Mateusz Zbikowski, et.al.
15:20	**ID181, Modelling and simulation of high-pressure hydrogen jets using H2FC european cyber-laboratory** James Keenan, Dmitriy Makarov, Vladimir Molkov	**ID116, ISO 19880-1, hydrogen fueling station and vehicle interface safety technical report** Jesse Schneider, Guy Dang-Nhu, Nick Hart, et.al.	**ID113, Detonation wave propagation in semi-confined layers of hydrogen-air and hydrogen-oxygen mixtures** Joachim Grune, Karsten Sempert, Andreas Friedrich, et.al.
15:40	**ID256, Mixed e-learning and virtual reality pedagogical approach for innovative hydrogen safety training for first responders** Svetlana Tretsiakova-McNally, Eric Maranne, Franck Verbecke, et.al.	**ID117, Hydrogen fueling standardization: enabling FCEVs with "same as today" fueling time and driving range** Jesse Schneider, Graham Meadows, Morten Wistoft-Ibsen, et.al.	**ID112, Numerical analysis of detonation propensity of hydrogen-air mixtures with addition of methane, ethane or propane** Agnieszka Jach, Andrzej Teodorczyk
16:00	Break		
	Hydrogen safety aspects in other applications/industries/technologies Chair: Andrzej Teodorczyk	**Regulations Codes and Standards (RCS)** Chair: Marc Steen	**Behavior - Ignition** Chair: Luc Bauwens
16:20	**ID122, CFD design of protective walls against the effects of vapor cloud fast deflagration of hydrogen** Elena Vyazmina, Simon Jallais, Alberto Beccantini, et.al.	**ID118, Hydrogen monitoring requirements in the global technical regulation on hydrogen and fuel cell vehicles** William Buttner, Matthew Post, Carl Rivkin, et.al.	**ID249, Ignition of hydrogen-air mixtures by moving heated particles** Josue Melguizo-Gavilanes, Stephanie Coronel, Remy Mevel, et.al.
16:40	**ID242, Fundamental combustion properties of oxygen enriched hydrogen-air mixtures relevant to safety analysis: experimental and simulation study** Remy Mevel, Jeremy Sabard, J Lei, et.al.	**ID120, Continuous codes and standards improvement (CCSI)** Carl Rivkin, Robert Burgess, William Buttner	**ID250, Hot surface ignition of hydrogen-air mixtures** Josue Melguizo-Gavilanes, Remy Mevel, Joseph E. Shepherd
17:00	**ID197, Hydrogen risk analysis for a generic nuclear containment ventilation system** Zhanjie Xu, Thomas Jordan	**ID124, Composite gas cylinders probabilistic analysis of minimum burst und load cycle requirements** Georg Mair, Ben Becker, Eric Duffner, et.al.	**ID163, An experimental study on mechanism of selfignition of high-pressure hydrogen** Wataru Kaneko, Keita Hayashi, Kazuhiro Ishii
17:20	**ID218, Safety concept of nuclear cogeneration of hydrogen and electricity** Karl Verfondern, Xing Yan, Tetsuo Nishihara, et.al.	**ID166, Safety requirements for liquefied hydrogen tankers** Junichi Kudou, Susumu Ota, Yoshihiro Senga	**ID172, Auto-ignition mechanism near the boundary layer for high-pressure hydrogen release into circular and rectangular tubes** Akinori Yokoyama, Makoto Asahara, Daiki Muto, et.al.
17:40	**ID222, In situ x-ray absorption spectroscopy study on water formation reaction of palladium metal nanoparticle catalyts** Daiju Matsumura, Masashi Taniguchi, Hirohisa Tanaka, et.al.	**ID221, IPHE regulations codes and standards working group-type IV COPV round robin testing** Miguel Maes, Larry Starritt, JinYang Zheng, et.al.	**ID108, Self-ignition of hydrogen-nitrogen mixtures during high-pressure release into air** Wojciech Rudy, Andrzej Teodorczyk, Jennifer Wen
18:00 18:40	Networking Cocktail		

Time	Tuesday, October 20, 2015 Room Nichirin I - Room Nichirin II - Room Nichirin III - Room Nichirin IV		
	Nichirin I **Hydrogen Deflagrations** Chair: Trygve Skjold	Nichirin II+III **Government Safety Programs** Chair: John Khalil	Nichirin IV **Safety in hydrogen infrastructure** Chair: Vladimir Molkov
9:00	**ID149, Effects of radiation on the flame front of hydrogen-air explosions** Armin Kessler, Conrad Wassmer, Sebastian Knapp, et.al.	**ID269, Regulations, codes and standards (RCS) for hydrogen techologies - an historical overview** Carl Rivkin	**ID140, Industrial storage - recent improvements and industrial prospective** Hervé Barthelemy, Mathilde Weber
9:20	**ID162, Outward propagation velocity and acceleration characteristics in hydrogen-air deflagration** Toshiyuki Katsumi, Hironori Kabayashi, Takuro Aida, et.al.	**ID203, Hydrogen and fuel cells: emphasizing safety to enable commercialization** Nick Barilo, Steven Weiner	
9:40	**ID155, Flammability profiles associated with highpressure hydrogen jets released in close proximity to surfaces** Jonathan Hall, Louise O'Sullivan, Pierre Benard	**ID257, Advances in research and development to enhance the scientific basis for hydrogen regulations, codes and standards** Chris San Marchi, Ethan Hecht, Isaac Ekoto, et.al.	**ID226, Performance evaluation of the miniaturized catalytic combustion type hydrogen sensor** Hiroshi Miyazaki, Hiromasa Tanjo, Kengo Suzuki, et.al.
10:00	**ID198, CFD evaluation against a large scale unconfined hydrogen deflagration** Ilias Tolias, Alexandros Venetsanos, Nikolaos Markatos, et.al.	**ID266, Overview of the doe hydrogen safety, codes and standards program part 4: hydrogen sensors** William Buttner, Carl Rivkin, Robert Burgess, et.al.	**ID123, Validation and recommendations for CFD and engineering modeling of hydrogen vented explosions: effects of concentration, stratification, obstruction and vent area** Elena Vyazmina, Simon Jallais
10:20	**ID160, Validated equivalent source model for an underexpanded hydrogen jet** Ethan Hecht, Xuefang Li, Isaac Ekoto	**ID228, (presentation only) H2FC European infrastructure first summary of an research infrastrcuture project on hydrogen technology and fuel cells** Thomas Jordan	**ID206, A study on dispersion resulting from liquefied hydrogen spilling** Shuntaro Unno, Yukichi Takaoka, Shoji Kamiya, et.al.
10:40	**ID212, The effect of polyurethane sponge blockage ratio on premixed hydrogen-air flame propagation in a horizontal tube** Quan Li, Changjian Wang, Changming Guo, et.al.		**ID211, Hazid for CO2-free hydrogen supply chain feed (front end engineering design)** Suguru Oyama, Satoru Sakanaka, Shuichi Sato
11:00	Break		
	Hydrogen Release Chair: Stuart Hawksworth	**H2 Safety aspects in other applications/industries/technologies** Chair: Antonio Ruiz	**Safety in H2 infrastructure** Chair: Akiteru Maruta (TBC)
11:20	**ID194, An analysis of the experiments carried out by HSL in the HyIndoor European project studying accumulation of hydrogen released into a semi-confined enclosure in real wind conditions, and comparison with existing analytical models** Deborah Houssin-Agbomson, Simon Jallais	**ID271, (presentation only) Hydrogen safety and loss prevention in industries** Sergey Dorofeev	**ID183, Development of hydrogen behavior simulation code system** Atsuhiko Terada, Yu Kamiji, Ryutaro Hino, et.al.
11:40	**ID127, Comparisons of helium and hydrogen releases in 1 m^3 and 2 m^3 two vents enclosures: concentration measurements at different flow rates and for two diameters of injection nozzle** Gilles Bernard-Michel, Deborah Houssin		**ID300, Current achievements about hydrogen production and H_2 research at SGRI/SGCC** Meng Niu
12:00	**ID207, Experimental investigation on helium jet release and distribution in a vented cylindrical enclosure – effect of wall temperature conditions** Aneesh Prabhakar, Nilesh Agrawal, Vasudevan Raghavan, et.al.	**ID301, Status of the Japanese Nuclear Hydrogen Safety Program** Ryutaro Hino	**ID253, Public perception on hydrogen infrastructure in Japan,** Kenshi Itaoka, Aya Saito, Kazunari Sasaki

12:20	**ID161, Numerical investigation on the dispersion of hydrogen leaking from a hydrogen fuel cell vehicle in seaborne transportation** Hideyuki Oka, Yuji Ogata, Yasushi Oka, et.al.	**ID138, Engineering safety in hydrogen-energy applications** Audrey Dulcos, Christophe Proust, Jérôme Daubech, et.al.	**ID302, Refueling Infrastructure Build up Korean Perspective** Young Lee
12:40	**ID187, Visualizaion of auto-ignition phenomenon under the controlled burst pressure** Koji Yamashita, Tei Saburi, Yuji Wada, et.al.	**ID158, Steam condensation effectin hydrogen venting from a BWR reactor building** Masahiro Kondo, Nejdet Erkan, Koji Okamoto	
13:00	Lunch		
	Nichirin I **Hydrogen Release** Chair: Jennifer Wen	Nichirin II+III **Behavior of gaseous hydrogen mixtures** Chair: Dag Bjerketvedt	Nichirin IV **Safety in hydrogen infrastructure** Chair: Ulrich Schmidtchen
14:20	**ID157, Hydrogen jet fires in a passively ventilated enclosure** Philip Hooker, Jonathan Hall, James Hoyes, et.al.	**ID195, An experimental study dedicated to wind influence on helium build-up and concentration distribution inside a 1 m³ semi-confined enclosure considering hydrogen energy applications conditions of use** Deborah Houssin-Agbomson, Jean-Yves Letellier, Philippe Renault, et.al.	**ID196, Venting deflagrations of local hydrogen-air mixture** Dmitriy Makarov, Philip Hooker, Michael Kuznetsov, et.al.
14:40	**ID164, Numerical investigation of hydrogen leakage from a high pressure tank and its explosion** Yuka Taira, Tei Saburi, Shiro Kubota, et.al.	**ID204, Numerical simulation of deflagration-to-detonation transition in hydrogen-air mixtures with concentration gradients** Changjian Wang, Jennifer Wen	**ID268, Update on regulation review for HRS construction and operations in Japan** Takeshi Yoshida
15:00	**ID165, Numerical investigation of vented hydrogen-air deflagration in a chamber** Shunsuke Tsuiji, Killian Hutchinson, Akiko Matsuo	**ID171, Numerical simulation of diverging detonation in hydrogen air mixtures** Ali Heidari, Jennifer Wen	**ID210, Research and development about safety improvement of hydrogen refueling stations** Masanori Hirose, Tetsufumi Ikeda, Yoichi Sone, et.al.
15:20	**ID230, Accidental hydrogen release in Gc-laboratory; a case study** Mathias Henriksen, Dag Bjerketvedt, Knut Vaagsaether, et.al.	**ID251, Comparison of convective schemes in hydrogen impinging jet CFD simulation** Ilias Tolias, Alexandros G. Venetsanos	**ID209, Guidelines and recommendations for indoor use of fuel cells and hydrogen systems** Béatrice L'Hostis, Deborah Houssin-Agbomson, Gilles Bernard-Michel, et.al.
15:40	Break		
16:00	**Site Visit**	**Japanese Tea Ceremony Experience**	**Special Japanese Educational Session**
18:15	Dinner		

Time	Wednesday, October 21, 2015 Room Nichirin I - Room Nichirin II - Room Nichirin III - Room Nichirin IV		
	Nichirin II+III **Hydrogen Society and Turning Point** Chair: (HySUT)		
9:00	**Toyota** Seiji Sano		
9:20	**Honda** Takashi Moriya		
9:40	**Lincoln-Hexagon** Patrick Breuer		
10:00	**Fuelling station buid-up-TÜV Süd Experience of a certification body** Tom Elliger		
10:20	**CaFCP - California Station Roll out** Jay Keller		
10:40	**Q&A**		
11:00	Break		
	Nichirin I **Risk/safety management** Chair: Andrei Tchouvelev	Nichirin II+III **Safety of Fueling** Chair: Guy Dang-nhu	Nichirin IV **Physical effects - Jets and Delflagrations** Chair: Alexandros G. Venetsanos
11:20	**ID110, HYRAM a methodology and toolkit for quantitative risk assessment of hydrogen systems** Katrina Groth, Ethan Hecht	**ID303, KIT Fueling Station Experience** Thomas Jordan	**ID215, Modeling of cryogenic hydrogen jets** Stella G. Giannissi, Alexandros G. Venetsanos, Nikolaos Markatos
11:40	**ID110, HYRAM a methodology and toolkit for quantitative risk assessment of hydrogen systems** Katrina Groth, Ethan Hecht	**ID303, KIT Fueling Station Experience** Thomas Jordan	**ID153, Non-monotonic overpressure vs. H_2 concentration behavoiur during vented deflagration. Experimental results** Martino Schiavetti, Marco Carcassi
12:00	**ID105, 3D risk management for hydrogen installations (HY3DRM)** Trygve Skjold, Katrina M. Groth, A. Christine La Fleur, et.al.	**ID111, Freeze of nozzle/receptacle during hydrogen fueling** Wataru Hiraki, Hiroyuki Mitsuishi	**ID154, Analysis of acoustic pressure oscillation during vented deflagration** Martino Schiavetti, Marco Carcassi
12:20	**ID107, Application of quantitative risk assessment for performance-based permitting of hydrogen fueling stations** A. Chris LaFleur, Alice Muna, Katrina Groth	**ID173, Hazard identification study for risk assessment of a hybrid gasoline-hydrogen fueling station with an onsite hydrogen production system using organic hydride** Jo Nakayama, Junji Sakamoto, Naoya Kasai, et.al.	**ID179, Numerical simulation on low-speed hydrogen jet diffusion** Yuki Takatori, Nobuyuki Tsuboi, Daiki Muto, et.al.
12:40	**ID101, Risk analysis of complex hydrogen infrastructures** Frank Markert, Alessia Marangon, Marco Carcassi, et.al.	**ID260, Estimation of final hydrogen temperature from refueling parameters** Jinsheng Xiao, Pierre Bénard, Richard Chahine	**ID217, Blast wave from bursing enclosure with internal hydrogen-air deflagration** Tomoyuki Matsunaga, Toshio Mogi, Ritsu Dobashi
13:00	Lunch		
	Safety of energy storage Chair: Inaki Azkarate	**Safety in H2 vehicles** Chair: Nha Nguyen	**Physical effects - Blasts and Jets** Chair: Changjian Wang
14:00	**ID102, Modeling thermal response of polymer composite hydrogen cylinders** Zaki S Saldi, Jennifer X Wen	**ID131, CFD study of the unignited and ignited hydrogen releases from trpd under a fuel cell car,** Zhiyong Li, Dmitriy Makarov, James Keenan, et.al.	**ID243, High pressure hydrogen tank rupture: blast wave and fireball** Wookyung Kim, Volodymyr Shentsov, Dmitriy Makarov, et.al.
14:20	**ID139, Cylinders and tubes used as buffers in filling stations** Hervé Barthelemy, Alberto Agnoletti	**ID146, The possibility of an accidental scenario for marine transportation of fuel cell vehicle-hydrogen releases from tprd by radiant heat from lower deck** Yohsuke Tamura, Kenji Sato	**ID259, Removing the disrupting wind effect in single vented enclosure exposed to external wind** Stella G. Giannissi, Ilias C. Tolias, Alexandros G. Venetsanos

14:40	**ID150, Full scale experimental campaign to determine the actual heat flux produced by fire on composite storages - calibration tests on metallic vessels** Fabien Fouillen, Jérôme Daubech, Lucas Bustamante Valencia, et.al.	**ID239, Towards a set of design recommendations for pressure relief devices on-board hydrogen vehicles** David Yates, Dmitriy Makarov, Vladimir Molkov	**ID115, Boundary layer effects on the critical nozzle of hydrogen sonic jet** Mohammadamin Afroosheh, Marius Paraschivoiu, Farbod Vakilimoghadda
15:00	**ID229, Modelling heat transfer in an intumescent paint and its effect on fire resistance of on-board hydrogen storage** Yangkyun Kim, Dmitriy Makarov, Sergii Kashkarov, et.al.	**ID114, Characteristics of hydrogen leakage sound from a fuel-cell vehicle by hearing** Kiyotaka Maeda, Koji Yamazaki, Yohsuke Tamura	**ID148, The pressure peaking phenomenon: validation for unignited releases in laboratory-scale enclosure** Volodymyr Shentsov, Mike Kuznetsov, Vladimir Molkov
15:20	**ID133, Hydrogen fast filling to a type IV tank developed for motorcycles** Eisuke Yamada, Wataru Hiraki, Hitoshi Muramatsu	**ID168, Study of a post-fire verification method for the activation status of hydrogen cylinder pressure relief devices** Koji Yamazaki, Yohsuke Tamura	**ID201, Comparison of two-layer model for high pressure hydrogen jets with notional nozzle model predictions and experimental data** Xuefang Li, David Christopher, Ethan Hecht, et.al.
15:40	Break		
	Nichirin I **Hydrogen effects on materials and components** Chair: Herve Barthelemy	Nichirin II+III **Safety in H2 vehicles** Chair: Daniele Melideo	Nichirin IV **Hydrogen Explosions** Chair: Akiko Matsuo
16:00	**ID159, Enhancing safety of hydrogen containment components through materials testing under in-service conditions** Brian Somerday, Jeff Campbell, Ken Lee, et.al.	**ID216, Numerical study on the influence of different boundary conditions on the efficiency of hydrogen recombiners inside a car garage** Johannes Baggemann, Wilfried Jahn, Stephan Kelm, et.al.	**ID234, Hydrogen explosions in 20' ISO container** Ole Kristian Sommersel, Knut Vaagsather, Dag Bjerketvedt
16:20	**ID188, Threshold stress intensity factor for hydrogen assisted cracking of Cr-Mo steel used as stationary storage buffer of a hydrogen refueling station** Takuya Matsumoto, Masanobu Kubota, Saburo Matsuoka, et.al.	**ID261, Simulation analysis on the risk of hydrogen releases and combustion in subsea tunnels** Haiyan Bie, Zongrui Hao	**ID174, Explosion venting of rich hydrogen-air mixtures in a cylindrical vessel with two symmetrical vents** Jin Guo, Cao Yong, Kunlun Hu, et.al.
16:40	**ID252, Hydrogen effects on X80 pipeline steel under high-pressure natural gas/hydrogen mixtures** Bo Meng, Chaohua Gu, Lin Zhang, et.al.	**ID156, Experimental study on vented hydrogen deflagrations in a low strength enclosure** Philip Hooker, James Hoyes, Jonathan Hall, et.al.	**ID135, Turbulent flame propagation in large unconfined $H_2/O_2/N_2$ clouds** Jérôme Daubech, Christophe Proust, Guillaume Lecocq
17:00	**ID223, Development of high-pressure hydrogen gas barrier materials** Mitsuo Shibutani, Akinobu Inakuma, Fumimasa Maki, et.al.	**ID152, Blast wave from hydrogen storage rupture in a fire** Vladimir Molkov, Sergii Kashkarov	**ID202, Experimental investigation of spherical-flame acceleration in lean hydrogen-air mixtures** C. Regis Bauwens, Jeffrey M. Bergthorson, Sergey B. Dorofeev
17:20		**ID137, CFD investigation of filling and emptying of hydrogen tanks** Daniele Melideo, Daniele Baraldi, Beatriz Acosta-Iborra, et.al.	**ID170, Numerical simulation of detonation failure and reinitiation in bifurcated tubes** Ali Heidari, Jennifer Wen
18:00	**Closing Session** Chair: Marco Carcassi		
18:30	No Host Bar		

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ORGANIZING INSTITUTIONS

hySafe Technova Inc.

WITH THE ENDORSEMENT OF

IPHE International Partnership for Hydrogen and Fuel Cells in the Economy · European Commission · U.S. Department of Energy Energy Efficiency & Renewable Energy Fuel Cell Technologies Office · HIA Hydrogen Implementing Agreement · ESS · Open Yokohama · Vigili del Fuoco Corpo Nazionale

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Conference Location

Yokohama Bay Sheraton Hotel & Towers

Conference Info

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