11 September		
Topical session on: **CFD for Regulations, Codes and Standards** A. Venetsanos -NCSRD	**11.50**	**Topical session on:** **Materials & Storage** I. Azkarate - INASMET
CFD for Regulations, Codes and Standards 1 ***chairman:*** A. Venetsanos –NCSRD		**Materials & Storage 1** ***chairman*** I. Azkarate – INASMET
1.1.281 *Jordan, T., García, J., Hansen, O., Huser, A., Ledin, S., Middha, P., Molkov, V., Travis, J., Venetsanos, A., Verbecke, F., Xiao, J.,* **Results of the HySafe CFD Validation Benchmark SBEPV5**	**12.10**	1.4.43 *Theiler, G., Gradt, Th.,* **Polymer Composites for Tribological Applications in Hydrogen Environment**
3.1.68 *Barley, C.D., Gawlik, K., Ohi, J., Hewett, R.,* **Analysis of Buoyancy-driven Ventilation of Hydrogen from Buildings**	**12.30**	1.4.44 *Hammond, R.I., Pargeter, R.J.,* **A Temperature Controlled Mechanical Test Facility to Ensure Safe Materials Performance in Hydrogen at 1000 bar**
3.1.78 *Hansen, Olav R., Middha, P. Miles, S.,* **CFD Simulation Study to Investigate the Risk from Hydrogen Vehicles in Tunnels**	**12.50**	1.4.66 *Barthélémy, H.,* **Compatibility of Metallic Materials with Hydrogen Review of the Present Knowledge**
1.1.60 *Xu, B. P., EL Hima, L., Wen, J. X., Dembele, S., Tam, V.H.Y.,* **Numerical Study of Spontaneous Ignition of Pressurized Hydrogen Release into Air**	**13.10**	1.4.91 *Azkarate, I., Ezponda, E., Madina, V.,* **Compatibility of Materials with Hydrogen Particular Case: Hydrogen Assisted Stress Cracking of Titanium Alloys**
Lunch		
CFD for Regulations, Codes and Standards 2 ***chairman:*** Kotchourko, A – FZK		**Materials & Storage 2** ***chairman*** *Barthélémy, H.*, – AIR LIQUIDE
1.1.65 *Houf, W.G., Evans, G.H., Schefer, R.W.,* **Analysis of Jet Flames and Unignited Jets from Unintended Releases of Hydrogen**	**14.30**	2.1.41 *Hu, J., Sundararaman, S., Chandrashekhara, K., Chernicoff, W.,* **Analysis of Composite Hydrogen Storage Cylinders under Transient Thermal Loads**
1.1.108 *Proust, Ch., Lacôme, J.M., Jamois, D., Perrette, L.,* **Processes of the Formation of Large Unconfined Clouds Following a Massive Spillage of Liquid Hydrogen on the Ground**	**14.50**	2.1.42 *López, G.E., Rengel, G.R, Isorna, LI.F, Rosa, I.F.,* **Optimization of a Solar Hydrogen Storage System: Safety Considerations**
1.1.112 *Papanikolaou, E.A., Venetsanos, A.G., CFD* **Simulations of Hydrogen Release and Dispersion Inside the Storage Room of a Hydrogen Refueling Station Using the ADREA-HF Code**	**15.10**	2.1.126 *Anders, S.,* **Thermal Loading Cases of Hydrogen High Pressure Storage Cylinders**
1.1.125 *Friedrich, A., Grune, J., Kotchourko, N., Kotchourko, A. Sempert, K., Stern, G., Kuznetsov, M.,* **Experimental Study of Jet-formed Hydrogen-air Mixtures and Pressure Loads from their Deflagrations in Low Confined Surroundings**	**15.30**	3.1.46 *Anton, D., Mosher,D., Fichtner, M., Kuriyama, N., Chahine, R., Dedrick, D.,* **Fundamental Safety Testing and Analysis of Hydrogen Storage Materials and Systems**
1.2.56 *Golub, V.V., Baklanov, D.I., Bazhenova, T.V., Golovastov, S.V., Ivanov, M.F., Laskin, I.N., Semin, N.V., Volodin, V.V.,* **Experimental and Numerical Investigation of Hydrogen Gas Auto-ignition**	**15.50**	1.2.45 *Lohstroh, W., Fichtner, M., Breitung, W., Complex* **Hydrides as Solid Storage Materials: First Safety Tests**
Break		
CFD for Regulations, Codes and Standards 3 ***chairmans: :*** A. Venetsanos –NCSRD, *Kotchourko, A* – FZK		**Materials & Storage 3** ***chairmans:*** I. Azkarate – INASMET, *Barthélémy, H.*, – AIR LIQUIDE
1.3.95 *Bédard-Tremblay, L., Fang, L., Bauwens, L., Finstad, P.H.E., Cheng, Z., Tchouvelev, A. V.,* **Simulation of Detonation after an Accidental Hydrogen Release in Enclosed Environments**	**16.40**	4.1.294 *Giardina M., Casamirra, M., Corchia, L., Lombardo, C., Messina, G., Castiglia, F.,* **Risk Analysis of the Storage Unit in Hydrogen Refuelling Station**
1.3.80 *Middha, P., Hansen, O. R., Grune, J., Kotchourko, A.,* **Validation of CFD Calculations against Ignited Impinging Jet Experiments**	**17.00**	3.1.157 *Wu, Y.,* **Initial Assessment of the Impact of Jet Flame Hazard from Hydrogen Cars in Road Tunnels and the Implication on Hydrogen Car Design**
3.1.145 *Tchouvelev, A.V., DeVaal, J., Cheng, Z., Corfu, R., Rozek, R., Lee, C.,* **CFD Modeling of Hydrogen Dispersion Experiments for SAE J2578 Test Methods Development**	**17.20**	2.1.121 *Vieira, A., Faria, H., de Oliveira, R., Correia, N., Marques, A.T.,* **Road Map for H_2 High Pressure On-board Storage Considering Safety and Costs Issues**
1.1.120 *Bénard, P., Tchouvelev, A., Hourri, A., Chen, Z., Angers, B.,* **High Pressure Hydrogen Jets in the Presence of a Surface**	**17.50**	2.1.109 *Wastiaux, S., Willot F., Coffre E., Schaaff J.P.,* **Testing Safety of Hydrogen Components**
Closure A. Venetsanos –NCSRD *Kotchourko,A* – FZK	**18.10**	**Closure:** I. Azkarate – INASMET, - Barthélémy, H., – AIR LIQUIDE

12 September		
Topical session on: **Hydrogen Behaviour & Consequences** J. Keller - Sandia National Laboratories	**11.50**	**Topical session on:** **Quantitative Risk Assessment,** **Safety Studies and Risk Mitigation** J. LaChance - Sandia National Laboratories
Hydrogen Behaviour & Consequences 1 ***chairman***: J. Keller - Sandia National Laboratories	**Quantitative Risk Assessment,** **Safety Studies and Risk Mitigation 1** ***chairman***: J. LaChance - Sandia National Laboratories	
1.1.51 *Gupta, S., Brinster, J., Studer, E., Tkatschenko, I.*, **Hydrogen Related Risks within a Private Garage: Concentration Measurements in a Realistic Full Scale Experimental Facility**	**12.10**	4.1.79 *Nilsen, S., Marangon, A., Middha, P., Engeboe, A., Markert, F., Ezponda, E., Chaineaux, J.,* **Determination of Hazardous Zones for a Generic Hydrogen Station – A Case Study**
1.1.54 *Kouchi, A., Okabayashi, K., Takeno, K., Chitose, K.,* **Dispersion Tests on Concentration and its Fluctuations for 40MPa Pressurized Hydrogen**	**12.30**	1.3.113 *Haugom, G.P., Holmefjord, K.O., Skogseth, L.O.,* **Assessment and Evaluation of 3rd Party Risk for Planned Hydrogen Demonstration Facility**
1.1.58 *Sommersel, O. K., Bjerketvedt, D., Vaagsaether, K., Fannelop, T.K.,* **Experiments with Release and Ignition of Hydrogen Gas in a 3m Long Channel**	**12.50**	1.4.77 *Øvland, S., Hansen, R.S.,* **Materials Considerations in Hydrogen Production**
1.3.67 *Dorofeev, S.B., Hydrogen Flames in Tubes*: **Critical Run-up Distances**	**13.10**	1.5.122 *Reinecke, E.-A., Kelm, S., Struth, S., Granzow, Ch., Schwarz, U.,* **Design of Catalytic Recombiners for Safe Removal of Hydrogen from Flammable Gas Mixtures**
Lunch		
Hydrogen Behaviour & Consequences 2 ***chairman***: *Shirvill, L.C* - Shell Global Solutions	**Quantitative Risk Assessment,** **Safety Studies and Risk Mitigation 2** ***chairman***: *Hansen, A.M* - Norsk Hydro ASA	
1.1.62 *Lowesmith, B.J., Hankinson, G., Spataru, C.I, Stobbart, M.,* **Gas Build-up in a Domestic Property Following Releases of Methane/Hydrogen Mixtures**	**14.30**	1.5.131 *Hoagland, W., Benson, D. K., and Smith, R. D.,* **Novel Wide-area Hydrogen Sensing Technology**
1.1.63 *Lacome, J.M., Dagba, Y., Perrette, L., Jamois, D., Proust, C.,* **Large-scale Hydrogen Release in an Isothermal Confined Area**	**14.50**	1.5.251 *Cerchiara, G., Carcassi, M.N.,* **Quantification of the Uncertainty of the Peak Pressure Value in the Vented Deflagrations of Air-Hydrogen Mixtures**
1.3.40 *Teodorczyk A., Drobniak P., Dabkowski A.,* **Fast Turbulent Deflagration and DDT of Hydrogen-Air Mixtures in Small Obstructed Channel**	**15.10**	2.1.73 *Fateev, V.N., Grigoriev, S.A., Millet, P., Korobtsev, S.V.,* **Hydrogen Safety Aspects of High Pressure PEM Water Electrolysis**
1.3.106 *Friedrich, A., Grune, J., Jordan, T., Kotchourko, A., Kotchourko, N., Kuznetsov, M., Sempert, K., Stern*, **G., Experimental Study of Hydrogen-Air Deflagrations in Flat Layer**	**15.30**	2.1.75 *Zhang, L., Adey, R.A.,* **Predicting the Probability of Failure of Gas Pipelines Including Inspection and Repair Procedures**
Break		
Hydrogen Behaviour & Consequences 3 ***chairmans:*** J. Keller - Sandia National Laboratories - *Shirvill, L.C* - Shell Global Solutions	**Quantitative Risk Assessment,** **Safety Studies and Risk Mitigation 2** ***chairmans*:** J. LaChance - Sandia National Laboratories -*Hansen, A.M* - Norsk Hydro ASA	
1.3.69 *Merilo, E.G., Groethe, M.A.,* **Deflagration Safety Study of Mixtures of Hydrogen and Natural Gas in a Semi-open Space**	**16.10**	2.1.81 *Haugerød, T., Hansen, A.M.,* **Hydrogen Refuelling Stations for Public Transport Quality and Safety in the User-interface**
1.3.96 *Royle, M., Shirvill, L.C., Roberts, T.A.,* **Vapour Cloud Explosions from the Ignition of Methane/Hydrogen/Air Mixtures in a Congested Region**	**16.40**	3.1.59 *Müller, C., Fürst, S., von Klitzing, W., Hagler, T.,* **Hydrogen Safety: New Challenges Based on BMW Hydrogen 7**
1.1.158 *Y. Wu, I. S. Al-Rahbi, Y. Lu, G. T. Kalghatgi,* **Prediction of the Lift-off, Blow-out and Blow-off Stability Limits of Pure Hydrogen and Hydrogen/Hydrocarbon Mixture Jet Flames**	**17.00**	3.1.71 *Gambone, L.R. Wong, J.Y.,* *Fire Protection Strategy for Compressed Hydrogen-Powered Vehicles*
1.3.97 *Weiser, V., Roth, E., Eckl, W., Kessler, A., Langer. G.,* **Heat Radiation of Burning Hydrogen/Air Mixtures Impurified by Organic Vapour and Particles**	**17.20**	1.1.107 *Heitsch, M., Baraldi, D., Moretto, P., Wilkening, H.,* **Safety of Laboratories for New Hydrogen Techniques**
Closure J. Keller - Sandia National Laboratories - *Shirvill, L.C* - Shell Global Solutions	**18.10**	**Closure** J. LaChance - Sandia National Laboratories - *Hansen, A.M* - Norsk Hydro ASA

13 September		
Topical session on: **Hydrogen Facility Permitting** M. Molag - TNO		**Topical session on:** **Education and Professional /Technical Training Tools** F. Postel - West Sacramento Fire Department
Hydrogen Facility Permitting 1 **chairman:** M. Molag - TNO		**Education and Professional /Technical Training Tools 1** **chairman:** F. Postel - West Sacramento Fire Department
4.1.64 *Ohi, J.,* **Hydrogen Safety and Permitting Hydrogen Fueling Stations**	**12.10**	1.5.90 *Grasso, N., Ciannelli, N., Pilo, F., Carcassi, M.N., Ceccherini, F.* **Guidelines for Fire Corps Standard Operating Procedures in the event of Hydrogen Releases**
4.1.129 *LaChance, J., Tchouvelev, A., Ohi, J.,* **Risk-Informed Process and Tools for Permitting Hydrogen Fueling Stations**	**12.30**	1.3.39 *Weiner, S.C., Kinzey, B.R., Dean, J., Davis, P.B., Ruiz, A.,* **Incident Reporting: Learning from Experience**
4.1.143 *Duijm, N.J., Markert, F.,* **Safety-Barrier Diagrams for Documenting Safety of Hydrogen Applications**	**12.50**	1.5.100 *Hay, R., Tchouvelev, A. V., Benard, P., Wong, J., MacIntyre, I.,* **Hydrogen Safety, Training and Risk Assessment System**
4.1.93 *Grasso, N., Pilo, F., Ciannelli, N., Carcassi, M.N., Mattei, N., Ceccherini, F.* **Fire Prevention Technical Rule for Gaseous Hydrogen Transport in Pipelines**	**13.10**	1.5.130 *Chernicoff, W. P., McCullough, R., Postel, F.,* **The Hydrogen Executive Leadership Panel (HELP) Initiative for Emergency Responder Training**
Lunch		
Miscellaneous 1 **chairman:** Ohi, J., - National Renewable Energy Laboratory		**Miscellaneous 2** **chairman:** *MacIntyre, I.,* - Natural Resources Canada
4.1.288 *Kim., E.J., Kim, Y. G., Moon, I.I., Kim, j.,* **Simulator Development of Virtual Experience and Accident Scenarios of Hydrogen Stations for Safety**	**14.30**	3.1.82 *Weilenmann, M., Bach, Ch., Novak, Ph., Fischer, A., Hill, M.,* **Model-based Determination of Hydrogen System Emissions of Motor Vehicles Using Climate-Chamber Test Facilities**
1.3.132 *Shirvill, L.C., Royle, M., Roberts, T.A.,* **Hydrogen Releases Ignited in a Simulated Vehicle Refuelling Environment**	**14.50**	3.2.101 *Lebbal, M.E. Lecoeuche, S.,* **Identification and Monitoring of a PEM Electrolyser Based on Dynamical Modelling**
6.0.00 *De Vries, H. , Florisson, O., Tiekstra, G.C.,* **Safe Operation of Natural Gas Appliances Fueled with Hydrogen/Natural Gas Mixtures**	**15.10**	6.1.00 *Zhang, J. Hereid, J., Hagen, M., Bakirtzis, D., Delichatsios, M.A., Venetsanos, S.G.,* **Numerical Studies of Dispersion and Flammable Volume of Hydrogen in Enclosures**
6.2.00 *Denisenko V.P., Kirillov I.A., Korobtsev S.V., Nikolaev I.I., Kuznetsov A.V., Gevorkian A.G., Feldstein V.A.,* **Hydrogen Release and Mixing Experiments in Medium-scale Cylindrical Vessel**	**15.30**	6.3.00 *Petukhov, V.A., Naboko, I.M., Fortov, V.E.,* **Explosion Hazard of Hydrogen-Air Mixtures in the Large Volumes**
Break		
Miscellaneous 3 **chairmans:** M. Molag - TNO - Ohi, J., - National Renewable Energy Laboratory		**Miscellaneous 4** **chairmans:** F. Postel - West Sacramento Fire Department - *MacIntyre, I.,* - Natural Resources Canada
1.3.52 *Granovskiy E.A., Lifar V.A., Skob Yu.A., Ugryumov M.L.,* **Computational Modeling of Pressure Effects from Hydrogen Explosions**	**16.10**	1.5.134 *Joseph-Auguste, C., Cheikhravat, H. , Djebaïli-Chaumeix, N. and Deri, E.* **On the use of spray systems: an example of R&D work in hydrogen safety for nuclear applications**
2.1.98 *Cárdenas, R., Alfonso, D., Peñalvo, E., Perez-Navarro, A., Perpiñá, C., Vargas, C.,* **Potential for Hydrogen Production from Biomass Residues in the Valencian Community**	**16.30**	2.1.53 *Sheffield, J. W., Koylu, U. O.,* **A Rural Hydrogen Transportation Test Bed**
1.1.83 Yuki Ishimoto, Erik Merilo, Mark Groethe, Seiki Chiba, Hiroyuki Iwabuchi, Kou Sakata **Study of hydrogen diffusion and deflagration in a closed system**	**16.50**	3.2.76 *Muppala, S., Wen, J.X., Aluri, N.K., Dinkelacker, F.,* **Molecular Effects of Hydrocarbon Addition on Turbulent Hydrogen Flame Propagation**