

25th Hydrogen Safety Panel Meeting

April 1-4, 2019

Hilton New Orleans Riverside

2 Poydras St

Steering Room/Riverside Complex

New Orleans, LA 70130, U.S.

NOTE: The Hydrogen Safety Panel (HSP) meeting is being held at the same location as the AIChE Spring Meeting. If you are only attending the HSP meeting, then registration with AIChE is not required.

Dial-in: 866-528-1882, ID# 2902683

Meeting URL: <https://www.gotomeeting.com/join/600770525>

Monday, April 1, 2019

10:00 am – 12:00 pm

- ▶ Meet the HSP, an informal open-door discussion time – Richard Kallman, Chair of the HSP and Nick Barilo, HSP Program Manager & Director of the Center for Hydrogen Safety (CHS)

1:00 pm – 5:00 pm

- ▶ Welcome, safety and introductions – Richard Kallman, Chair of the HSP
 - Introduction of new HSP members
- ▶ Format of the meeting and new discussion topics Hydrogen Safety Panel status and discussion of activities since the 24th meeting
 - Results from the 2018 Annual Merit Review – Nick Barilo, HSP Program Manager & Director of CHS
 - Review of current action items – Richard Kallman, Chair of the HSP
 - Discussion and learnings from the previous year's activities including HSP project reviews – HSP members facilitated by Nick Barilo, HSP Program Manager & Director of CHS
 - Department of Defense, Keyport, WA
 - Argonne National Laboratory
 - California Energy Commission, including liquid hydrogen station deployments
 - Others
- ▶ Mobile application task group update and discussion on the white paper – Richard Kallman, Chair of the HSP and the task group members
- ▶ Update on HyRAM and a HyRAM demonstration focusing on how members of the HSP can use it – Chris LaFluer, Program Lead for Hydrogen Safety, Codes and Standards, Sandia National Laboratories
- ▶ Changes in the hydrogen fueling infrastructure/overview of global infrastructure – Andrei Tchouvelev, President & CEO, A.V.Tchouvelev & Associates Inc.
 - FCEV-HFS interface: mostly interoperability with some potentially new safety challenges there; heavy duty, high flows (link with GTR Phase 2)
- ▶ Ventilated enclosures – guidance for sensor placement (in the works) – Andrei Tchouvelev, President & CEO, A.V.Tchouvelev & Associates Inc.

Tuesday, April 2, 2019

8:00 am – 12:00 pm

- ▶ Recap and action items from Monday's meeting – Richard Kallman, Chair of the HSP
- ▶ Status of the U.S. Department of Energy (DOE) Fuel Cells Program (including H2@Scale) and round table discussion – Sunita Satyapal, Director of the U.S. Department of Energy's Fuel Cell Technologies Office
- ▶ Hydrogen safety and regulations in Australia – Nick Smith, Director, Energy Programs & Services for South Australia
- ▶ Status on HySafe and the European Union Hydrogen Safety Panel activities – Stuart Hawksworth, Head, Centre for Energy and Major Hazards HSE & President, International Association for Hydrogen Safety

12:00 pm – 1:15 pm AIChE Luncheon – Sunita Satyapal, Director of the U.S. Department of Energy's Fuel Cell Technologies Office, will be presenting (HSP meeting attendees will need to purchase a ticket for the luncheon prior to the event)

1:30 pm – 5:50 pm **Launch of the Center for Hydrogen Safety**

- ▶ Welcoming remarks – June Wispelwey, AIChE Executive Director and CEO
- ▶ An Overview of the Hydrogen and Fuel Cell Technologies Industry at Large – Sunita Satyapal, Director of the U.S. Department of Energy's Fuel Cell Technologies Office
- ▶ The National Laboratory role in the implementation of hydrogen safety – Mike Rinker, Manager, Energy and Environment Sector, Pacific Northwest National Laboratory
- ▶ Panel Discussion: Challenges Faced in Hydrogen Safety – Chaired by Nick Barilo, Director of CHS & HSP Program Manager
 - **US Perspective** – Aaron Harris, Technical Director for Hydrogen Energy, Air Liquide
 - **Australia Perspective** – Nick Smith, Director, Energy Programs & Services for South Australia
 - **Europe Perspective** – Stuart Hawksworth, Head, Centre for Energy and Major Hazards HSE & President, International Association for Hydrogen Safety
 - **Asia-Pacific Perspective** – Ryuji Kikuchi, Associate Professor, the University of Tokyo, and member, the Society for Chemical Engineers, Japan
- ▶ Presenting the safety solution: The need for a CHS, key activities and opportunities to engage – Nick Barilo, Director of CHS & HSP Program Manager
- ▶ Open discussion and networking – Nick Barilo, Director of CHS & HSP Program Manager

Wednesday, April 3, 2019

8:00 am Recap and action items from Tuesday's meeting – Richard Kallman, Chair of the HSP

8:15 am – 5:00 pm (no-host lunch around noon as part of AIChE Spring Meeting)

- ▶ Discussion and feedback from the CHS Kickoff – Nick Barilo, HSP Program Manager and Director of CHS
 - HSP future activities including CHS interactions and work products
 - Potential CHS-HSP international activities and collaborations
 - HSP member discussion and feedback

- ▶ DOE Safety, Codes and Standards update and future work – Laura Hill, Manager of Safety, Codes and Standards at the U.S. Department of Energy's Fuel Cell Technologies Office
- ▶ Discussion on hydrogen incidents since the previous HSP meeting
 - PNNL laboratory incident – Bob Zalosh, Firexplo
 - Mountain View drive off and related incidents – Aaron Harris, Technical Director for Hydrogen Energy, Air Liquide
 - NREL high pressure diaphragm failure due to incompatible material – Larry Moulthrop, Proton On-Site (retired)
 - December 24th Audi Type IV CNG tank failure at a station in Germany (media made connection to hydrogen) – Livio Gambone, HSP Member and Head of Hydrogen Storage, Nikola Corporation
 - Others – HSP members and attendees
- ▶ New areas of hydrogen use – now and coming soon – HSP members facilitated by Richard Kallman, Chair of the HSP
 - H2@Scale
 - Trains
 - Marine applications
 - Heavy trucks – Livio Gambone, HSP Member and Head of Hydrogen Storage, Nikola Corporation
 - Drones – Bob Zalosh, Firexplo
- ▶ NFPA 2 code, ISO 19880 standards series developments – HSP members facilitated by Richard Kallman, Chair of the HSP
 - Update on important code changes in NFPA, including liquid hydrogen distances.
 - Update on liquid hydrogen safety distance activities – Chris LaFluer, Program Lead for Hydrogen Safety, Codes and Standards, Sandia National Laboratories

Thursday, April 4, 2019

8:30 am Recap and action items from Wednesday's meeting – Richard Kallman, Chair of the HSP

9:00 am – 11:00 am

- ▶ Project review: Insitu, Jeff Knapp/Ian Richardson and HSP Members – Facilitated by Richard Kallman, Chair of the HSP

11:00 am – 1:00 pm

- ▶ Agenda topics not covered and new topics – Richard Kallman, Chair of the HSP
- ▶ Open discussion and action items from the meetings – Richard Kallman, Chair of the HSP
- ▶ Plans for the 26th Hydrogen Safety Panel meeting

Hydrogen Safety Panel Membership

Name	Affiliation
Nick Barilo, Manager	Pacific Northwest National Laboratory
Richard Kallman, Chair	City of Santa Fe Springs Fire (retired)
Ken Boyce	UL
David Farese	Air Products and Chemicals
Donald Frikken	Becht Engineering
Livio Gambone	Nikola Motors
Aaron Harris	Air Liquide
Brian Ladds	Calgary Fire Department
Chris LaFleur	Sandia National Laboratories
Miguel Maes	NASA-JSC White Sands Test Facility
Larry Moulthrop	Proton OnSite (retired)
Andrei Tchouvelev	A.V. Tchouvelev & Associates Inc.
Tom Witte	Witte Engineered Gases
Robert Zalosh	Firexplo