

## H2@Rail<sup>SM</sup> Workshop Agenda

March 26-27, 2019

The James B. Henry Center for Executive Development | Lansing, Michigan

### **Workshop Introduction and Objectives**

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Government and industry technology developers world-wide are realizing the potential for hydrogen rail applications and this workshop will help identify needed research to accelerate technology development and industry commercialization.

In collaboration with Department of Transportation's Federal Railroad Administration and as part of Department of Energy's H2@Scale Initiative, we welcome workshop participants and look forward to exploring opportunities for cooperation and collaboration on hydrogen rail areas of interest.

The objectives of this workshop are to:

- Assess the state of the art on electric rail power propulsion specifically using fuel cells
- Discuss operational requirements and lessons learned on early fuel cell rail projects
- Understand current technology gaps and identify collaborative R&D topics

### **Tuesday, March 26 | Day 1**

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#### **Session I - Domestic Government Perspectives on Hydrogen Rail**

*Moderator: Pete Devlin, DOE-FCTO*

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|---------|--|
| 1:00 PM | <b>Welcoming Remarks from Michigan State University</b><br><i>Sanjay Gupta, Dean of the Broad College of Business, Michigan State University</i>                                     |
| 1:10 PM | <b>Welcoming Remarks and H2@Scale/H2@Rail Overview</b><br><i>Sunita Satyapal, Director, U.S. Department of Energy Fuel Cell Technologies Office (DOE-FCTO)</i>                       |
| 1:40 PM | <b>FRA Program R&amp;D Overview</b><br><i>Melissa Shurland, Program Manager, Rolling Stock Research, U.S. Department of Transportation Federal Railroad Administration (DOT-FRA)</i> |
| 2:10 PM | <b>Mark Maday and Phani Raj</b><br><i>Staff Director – Hazardous Materials and General Engineer, DOT-FRA</i>   |
| 2:40 PM | <b>Break &amp; Network</b>   |
| 3:00 PM | <b>Momoko Tamaoki</b><br><i>Office Chief of Rail Equipment and Procurement, California State Transportation Agency</i>   |

3:30 PM

**Carrie Schindler**

*Director of Transit and Rail, San Bernardino County Transportation Authority*

4:00 PM

**Session I Panel Discussion**

4:30 PM

**Wrap Up and Next Steps**

5:00 PM

**Adjourn**

6:00 PM

**No Host Dinner**

7:30AM                    **Breakfast**

**Session II - Hydrogen Rail Status International Overviews**

*Moderator: Shuk Han Chan, DOE-FCTO*

8:00 AM                    **Elena Hof**  
*Program Manager, German National Organization Hydrogen and Fuel Cell Technology*

8:20 AM                    **Leanna Belluz**  
*Senior Engineer, Department of Transport Canada*

8:40 AM                    **Seky Chang**  
*Chief Researcher, Korean Railroad Research Institute*

9:00 AM                    **Session II Panel Discussion**

9:30 AM                    **Break & Network**

**Session III – Industry Perspectives**

**Operators' Perspectives**

*Moderator: Phani Raj, DOT-FRA*

9:50 AM                    **Michael Fore**  
*Director – Technical Services, American Association of Railroads*

10:10 AM                    **Michael Cleveland**  
*Senior Manager of Emerging Technology, BNSF Railway*

10:30 AM                    **Mark Duve**  
*Manager of Locomotive Engineering, Norfolk Southern*

10:50 AM                    **Session III Panel Discussion**

**Technology Developers' Perspectives**

*Moderator: Dimitrios Papageorgopoulos, DOE-FCTO*

11:20 AM                    **Reid Larson and Scott Nason**  
*Product Manager - Fueling System and Product Manager, Chart Industries*

11:40 AM                    **Alan Mace**  
*Product Manager, Ballard*

12:00 PM            **Lunch & Network**

1:00 PM            **Rob Harvey**  
*Large Scale Infrastructure Project Manager, Hydrogenics*

1:20 PM            **Jens Steger**  
*Vehicle Lead Engineer, Stadler US Inc.*

1:40 PM            **Andreas Frixen**  
*Tender Manager Fuel Cell Trains, Alstom*

2:00 PM            **Session III Panel Discussion**

2:30 PM            **Break & Network**

**Session IV – Hydrogen Rail Assessment**

*Moderator: Pete Devlin, DOE-FCTO*

2:50 PM            **Andreas Hoffrichter**  
*Burkhardt Professor in Railway Management, Michigan State University*

3:10 PM            **Total Cost of Ownership for Line Haul, Yard Switchers and Regional Passenger Locomotives**  
*Rajesh Ahluwalia, Senior Engineer, Argonne National Laboratory*

3:30 PM            **Hydrogen for Rail Applications**  
*Brian Ehrhart, Chemical Engineer, Sandia National Laboratories*

3:50 PM            **Session IV General Discussion**

4:20 PM            **Wrap Up and Next Steps**

4:40 PM            **Adjourn**