

# CENTER FOR RAILWAY RESEARCH AND EDUCATION: NEW PROGRAM

## RAILWAY MOTIVE POWER AND ALTERNATIVE PROPULSION

**SEPTEMBER 21-23, 2021**  
**LONG BEACH, CA**

Courtyard by Marriott  
500 East First Street, Long Beach, CA, 90802



“I want to thank you and your staff for putting this together. Very informative and relevant information. Came away with a wealth of knowledge. I am very happy with the conference!”

-Dean from Capitol Corridor



Center for Railway  
Research and Education  
Broad College of Business  
MICHIGAN STATE UNIVERSITY

## LEARNING OUTCOMES:

- Understand alternative propulsion systems drivers
- Know various power train architectures, their advantages and limitations; diesel, electric, hybrids, hydrogen fuel cells, etc.
- Assess motive power technologies to address environmental, fuel consumption, management, operations and capital cost concerns
- Understand design and operational aspects related to wayside power supply
- Understand the impact of duty cycles on propulsion system design and technology selection
- Know emerging research and applications of Hydrail

## PRICE & REGISTRATION:

\$1995 - full tuition (includes materials, site visit, meals, certificate of completion)

\$1795 - early bird registration (available through January 15, 2021)

### Registration Contact:

Sue Lonier  
Administrative Assistant  
+1-517-353-5667  
loniers@msu.edu

## SCHEDULE:

### Day 1:

9am

- Introduction
- Railway vehicle motion
- Diesel and electric propulsion systems

12noon lunch

1-5pm

- Hydrocarbon combustion and emissions
- Wayside power supply

### Day 2:

9am

- On-board energy storage systems and batteries suitable for propulsion
- Hybrid drive trains
- Discontinuous electrification and wireless power transfer

12noon lunch

1-5pm

- Alternative fuels and energy carriers
- Hydrogen fuel cell railway propulsion systems (Hydrail)
- Wrap up, conclusion, evaluation

### Day 3: Site visit

8:30am leave hotel

9am Port of LA / Long Beach

- Autonomous, battery-operated container handlers
- Hydrogen fuel cell trucks



## PROGRAM OVERVIEW:

Air quality and volatile diesel prices pose challenges to railways, particularly in urban areas. Traditional wayside power supply requires large capital investment and has visual impact. Emerging propulsion systems have the potential to address these concerns: (a) Rapidly developing battery technology with opportunity charging offers a suitable way forward for some railway services. (b) Hydrogen fuel cell systems offer zero-emission, longer range, flexibility, and lower capital cost than electrification. Knowledge and understanding of these technologies are essential to increase the effectiveness of capital investment, fleet modernization, and to avoid investment in stranded assets.

## WHO SHOULD ATTEND:

- Locomotive superintendents considering technology changes / fleet renewal or refurbishment
- New and experienced motive power professionals
- Railway R&D and project managers
- Consultants and professional advisers
- Government representatives, regulators, and policy advisors
- Rail transportation managers for ports / port authorities



## BENEFITS:

This two-and-a-half-day seminar provides participants with knowledge and understanding of railway motive power and its environmental, infrastructure, and capital implications. Participants will learn skills that will assist them in technology assessments, motive power management, policy and strategic planning with direct implications for projects that often have decades-long lifetimes and impacts.

The seminar builds awareness of emerging technologies, their opportunities and limitations compared to traditional choices. It will enable managers to engage confidently with consultants and manufacturers requesting and discussing alternative propulsion systems. Policy advisors and regulators will be able to adapt requirements and develop programs to enable safe, clean motive power.



## SITE VISIT INFORMATION:

A visit to the ports of Los Angeles / Long Beach is planned to experience automated, battery-powered container movers and hydrogen fuel cell trucks.

## Industry Subject Matter Experts:

\*Subject to availability

**Andreas Hoffrichter**, PhD

DB Engineering & Consulting USA Inc.  
Manager, Management Consulting,  
Sustainable Mobility & Zero Emission  
Technologies

Expert in zero-emissions propulsion systems for railway vehicles.

## Mike Iden

Rail Consultant, Tier 5 Locomotive LLC

Former head of Union Pacific for locomotives. Assisted with exploration and introduction of alternative propulsion.

## Carrie Schindler

Director Transit & Rail, San Bernardino County Transportation Authority.

Agency (SBCTA) ordered first Hydrogen powered train in the United States.

## Paul Childs

Chief Operating Officer, M-1 Rail, Detroit, MI.

Insight into the largest discontinuous electrification railway system in the country. Battery-powered streetcars charged with several designs.

## MORE INFORMATION:

[www.raileducation.com](http://www.raileducation.com)

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