JRC 2023

Joint Rail Conference

Intelligent Railroading

CONFERENCE
April 11-13, 2023

Sheraton Inner Harbor Hotel, Baltimore, MD

Program

https://event.asme.org/Joint-Rail-Conference

The American Society of Mechanical Engineers®
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SETTING THE STANDARD

Chair's Welcome Message

On behalf of the Organizing Committee, I welcome you to the 2023 Joint Rail Conference. This year's conference host is the beautiful Sheraton Inner Harbor Hotel that overlooks Baltimore's busy and historic waterfront.

The JRC is an international rail transportation research conference, hosted in North America; we welcome our colleagues who have traveled from abroad. Our conference theme this year is Intelligent Railroading.

With the number of international crises dominating world events, the transportation industry urgently needs to address new approaches to tackle global warming, move people and commodities to provide successful commerce with our allied neighbors, advance social justice and equity, and respond to the health concerns of growing populations. These must be our focus tasks. Finding intelligent solutions and working deeper in the details to address these and other growing concerns is where we as researchers, engineers, suppliers, managers, policy makers, and students are working to build a better tomorrow for our progeny. Authors, we applaud your solutions. And for our audience, we believe that you will find that our program includes a wealth of progressive information.

Once again, the Joint Rail Conference includes our partners at ASME, IEEE, ASCE, AREMA, INFORMS, and TRB to provide this multidisciplinary conference. This year we also welcome our colleagues from ASME's Safety Engineering and Risk Analysis Division (SERAD) to provide both paper presentations and a panel session that I'm sure you will find interesting.

We extend a warm welcome to each of our invited guest speakers who are prominent leaders in the transportation industry. The three days of the conference include both plenary and presentation sessions. In addition, the conference offers a technical tour of MTA's Light Rail facilities in the Baltimore area.

While you are here, take in the sights of Baltimore's Inner Harbor. There is so much to see and do, including visiting the National Aquarium, seeing the historic ships along the waterfront, visiting Fort McHenry National Monument that inspired the writing of "The Star-Spangled Banner," and grab a hotdog at Oriole Park at Camden Yards, which is just a short walk from the host hotel. Enjoy your visit and thank you for attending this year's conference!

Brian P Donohue

Conference Chair

Vice President, Transit and Rail Engineer
Sr. Technical Principal, EIT
WSP USA Inc.

Contents

General Information

ON SITE REGISTRATION AT THE SHERATON INNER HARBOR HOTEL

HOURS:
Tuesday, April 11
03:00 PM - 06:00 PM

Wednesday, April 12
7:00 AM - 05:00 PM

Thursday, April 13
07:00 AM - 05:00 PM

The following may register at the discounted Member rate(s) – Please contact Mary Jakubowski at jakubowskim@asme.org or onsite, at the registration desk if you are NOT a current ASME Member.

- ASME Members
- Authors, Session Chairs, Session Co-Chairs, Speakers
- ASME JRC Committee Members

Cooperating Societies include: APTA/ IEEE/ASCE/AREMA/INFORM-RAS/ NAS-TRB

AMERICAN SOCIETY OF MECHANICAL ENGINEERS INTERNATIONAL

Our Mission
Advancing engineering for the benefit of humanity.

Our Vision
The premier resource for the engineering community globally.

REGISTRATION REQUIREMENT:

Every presentation and panel presentation must identify a designated presenter. Every presenter must register and pay the applicable conference fees. If not, the presentation information will be removed from the conference program.

CANCELLATIONS:

All cancellation requests must be made in writing and emailed. Cancellations made through March 11, 2023, will receive a full refund, less a $100 administration fee. Refunds will be made within four weeks of the end of the conference. Refunds are not available beginning March 12, 2023. “No shows” are not refundable and are liable for the full registration fee.

ASME TRAVEL POLICY:

ASME is not responsible for the purchase of non-refundable airline tickets, or the cancellation/change fees associated with canceling a flight. ASME retains the right to cancel a course/conference up until 3 weeks of the scheduled presentation date.

ASME PRESENTER ATTENDANCE POLICY:

Paper information should not be used for citation purposes. According to ASME’s presenter attendance policy, if a paper is not presented at the conference, the paper will not be published in the official Archival Proceedings, which are registered with the Library of Congress, and are abstracted and indexed. The paper also will not be published in the ASME Digital Library and may not be cited as a published paper.

MEMBERSHIP:

All **new** registrants to the conference will receive a 4-month trial member. For everyone else, it is easy to apply, and the benefits include the fellowship and recognition from being associated with one of the largest engineering societies in the world. ASME members and student members, and members from select countries can receive a discount to the conference registration.

You can apply for ASME membership by registering online. Alternatively, you can call: 1-800-THE-ASME (800-843-2763) or outside North America 973-882-1167 and ASME will mail you an application, or you can e-mail to request an application.

For questions about the conference, hotel, and registration please contact:

Mary Jakubowski, CMP
Manager, Events Management
Tel: 212-591-7637

Email: jakubowskim@asme.org

"No shows" are not refundable and are liable for the full registration fee.

Please note: First time non-members who pay the full conference rate will be eligible for a 4-month trial membership in ASME. You can apply online by going to **https://www.asme.org/about-asme/professional-membership.**

TECHNICAL TOUR

MTA NORTH AVENUE YARD TECHNICAL TOUR

Date: Tuesday, April 11, 2023
Time: 1:30 pm – 4:30 pm*
Cost: $35.00
Maximum Attendees: 30

***Please meet in the hotel lobby by 12:45PM for a 1:00PM departure. We will return to the hotel at approximately 5:00PM. When we arrive at the Facility, we must check in at the 1st Floor Office. PPE Equipment (Hard Hats, Vests, and Sturdy Shoes are required).**

During the tour we will visit inside the Shop where there are multiple service tracks with Inspection Pits, Car Hoists, Overhead Cranes, Turntables, and a Wheel Truing Machine. In addition, there is a Pantograph Inspection Platform for the Maintenance Workers to gain access to the top of the Light Rail Vehicle.

There is also a Car Wash Building, a Paint Shop, a Warehouse where all the Spare Parts are kept, a Radio Shop, Welding Shop and Wheel Set Repair Area, Locker Rooms, and a Break Room. Located upstairs are the Administrative Offices.

There are two Traction Power Substations—one to power trains in the Yard and one to power trains in and out of the Shop.

The ASME Rail Transportation Division is entirely composed of volunteers from the railroad industry. If you are interested in participating, please contact a conference organizer or Mary Jakubowski at jakubowskim@asme.org.

PROFESSIONAL DEVELOPMENT HOURS RECORD FORMS

Participation record forms will be provided upon request to conference attendees who need to track their number of professional development hours (PDHs). Forms are available at the conference registration desk. Conferees should check the rules of their appropriate State licensing body to see if participation in this conference will qualify for credit to maintain a P.E. license or other professional certification.

TAX DEDUCTIBILITY

Expenses of attending professional meetings have been held to be tax deductible as ordinary business expenses for U.S. citizens. Because of changes in the tax code, the current level of deduction is subject to change.

CONFERENCE KEYNOTE LUNCHEONS

All attendees are encouraged to meet and discuss ideas with industry peers at the Conference Luncheons which feature a guest Keynote on Wednesday and Thursday.

SPECIAL SESSION	**WEDNESDAY, APRIL 12,2023**
Loch Raven Room I	**1:45pm - 3:15pm**

ASME OPEN JOURNAL OF ENGINEERING – MEET THE JOURNAL EDITOR

Authors are invited to submit their full JRC papers to the *ASME Open Journal of Engineering* (AOJE) for consideration. For papers that are accepted to the journal, ASME is offering all authors a discounted member fee of $1700 per paper to publish their papers fully open access, regardless of membership status.

Conference Schedule Overview

EVENT	TIME	LOCATION
Tuesday, April 11		
TECHNICAL TOUR	01:30 PM – 04:30 PM	Hotel Lobby (Meet at 12:15 PM for 1:00 PM Departure)
REGISTRATION OPENS	03:00 PM – 06:00 PM	Harborview Gallery
Wednesday, April 12		
REGISTRATION	7:00 AM – 5:00 PM	Harborview Gallery
WELCOME AND PLENARY SESSION *Eric Gebhardt (Wabtec Corporation)*	08:00 AM – 09:00 AM	Loch Raven I
TRACK 1-1: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)	9:00 AM – 10:30 AM	Camden I
TRACK 2-1: ROLLING STOCK (SPONSORED BY ASME RTD)	9:00 AM – 10:30 AM	Camden II
COFFEE BREAK	10:30 AM – 11:00 AM	Harborview Gallery
TRACK 2-2: ROLLING STOCK (SPONSORED BY ASME RTD)	11:00 AM – 12:30 PM	Camden II
TRACK 5-1: ELECTRIFICATION AND TRANSIT SYSTEMS(CO- SPONSORED WITH APTA)	11:00 AM – 12:30 PM	Camden I
LUNCH AND KEYNOTE *Kari Gonzales (MxV Rail)*	12:30 PM – 1:45 PM	Harborview Ballroom I
TRACK 3-1: SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)	1:45 PM – 3:15 PM	Camden I
TRACK 1-2: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)	1:45 PM – 3:15 PM	Camden II
ASME OPEN JOURNAL	1:45 PM – 3:15 PM	Loch Raven I
COFFEE BREAK	3:15 PM – 3:45 PM	Harborview Gallery
NEW ROLLING STOCK TECHNOLOGY PANEL	3:45 PM – 5:15 PM	Loch Raven I
Thursday, April 13		
REGISTRATION	7:00 AM – 5:00 PM	Harborview Gallery
CHALLENGES AND SOLUTIONS FOR SAFE OPERATION OF RAILROAD TRANSPORTATION PANEL	8:00 AM – 09:00 AM	Loch Raven I
TRACK 1-3: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)	9:00 AM – 10:30 AM	Camden I
TRACK 4-1: SAFETY ENGINEERING AND RISK ANALYSIS (CO-SPONSORED WITH ASME SERAD)	9:00 AM – 10:30 AM	Camden II
COFFEE BREAK	10:30 AM – 11:00 AM	Harborview Gallery
TRACK 3-2: SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)	11:00 AM – 12:30 PM	Camden I
TRACK 1-4: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)	11:00 AM – 12:30 PM	Camden II
LUNCH AND KEYNOTE *Jannet Walker-Ford (WSP USA Inc.)*	12:30 PM – 1:45 PM	Harborview Ballroom I
TRACK 1-5: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)	1:45 PM – 3:15 PM	Camden I
TRACK 2-3: TRACK 2 - ROLLING STOCK (SPONSORED BY ASME RTD)	1:45 PM – 3:15 PM	Camden II
COFFEE BREAK	3:15 PM – 3:45 PM	Harborview Gallery
TRACK 2-4: TRACK 2 - ROLLING STOCK (SPONSORED BY ASME RTD)	3:45 PM – 5:15 PM	Camden I
TRACK 1-6: TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)	3:45 PM – 5:15 PM	Camden II

2023 JOINT RAIL CONFERENCE WELCOME ADDRESS/PLENARY SESSION

Wednesday, April 12, 2023 - 8:00 AM – 9:00 AM

Eric Gebhardt
Executive Vice President and Chief Technology Officer, Wabtec Corporation

Biography:
As Executive Vice President and Chief Technology Officer, Eric is responsible for Wabtec's global technology and investment strategy, new product development, and global engineering organization. A respected technologist with more than 30 years of experience, Eric built his career developing innovative technology solutions in power generation, battery storage, renewables, and distributed power. He comes to this role as former Managing Director of KCK-US, an investment firm focused on the energy, life science, and industrial sectors. Prior, he spent nearly 30 years with General Electric in a variety of global engineering and leadership roles where he was responsible for driving the strategic direction for product and portfolio development, including Chief Geo Officer of GE Power, Chief Product Management Officer for Energy Connections, Chief Platforms and Operations Officer for Current, and Chief Technology Officer for GE Oil & Gas, among others. Eric earned his Bachelor of Science degree in Aerospace Engineering from Georgia Institute of Technology, has received nine patents for his pioneering work across the energy sector, and is a member of the National Academy of Engineering.

Presentation Title:
The Future of Rail

Abstract:
Rail is the cleanest, safest, and most efficient way to move goods over land. Despite these clear benefits, the industry is looking to take the next step in reducing its environmental footprint and growing freight volumes. Advancements in digital solutions and alternative-power locomotives are converging to decarbonize the North American rail network, while also increasing capacity. Eric will discuss how the combination of improvements in freight rail utilization and developments in advanced locomotive technology can help the rail industry eliminate up to 120 million tons of GHG emissions per year.

Eric Gebhardt

Executive Vice President and Chief Technology Officer, Wabtec Corporation

Welcome Address, Plenary Session

Wednesday, April 12, 2023 8:00 AM – 9:00 AM

2023 JOINT RAIL CONFERENCE WELCOME KEYNOTE SESSION

Wednesday, April 12, 12:30 PM – 1:45 PM

Kari Gonzales
President & CEO, MxV Rail

Biography:
Kari Gonzales is President & CEO of MxV Rail, the world's premier rail research advisory. Since taking the role in 2021, Kari has spearheaded the company's transformation from TTCI to MxV Rail.

Kari has been a part of MxV Rail, a subsidiary of the Association of American Railroads since 2000, advancing from a student intern to a research engineer, and then later assuming the role of Vice President and CFO. She leads the MxV Rail team with the advantage of 20 years' service and experience in the rail industry. She is a mechanical engineer by training, holds an MBA, and was recognized by Progressive Railroading as a "Rising Star." She was the inaugural candidate for the MxV Rail Railroad Exchange Program, spending a year at BNSF Railway's Texas headquarters as a visiting professional. In addition, Kari serves on a number of community and industry boards.

Presentation Title:
Railroading into the Future

Abstract:
The introduction of new technology and innovative solutions to long-standing challenges is making today's railroads safer, more efficient, and more reliable. Ms. Gonzales will provide insight into the ongoing technology developments in rail along with highlighting the need for new talent as we set the stage for the next generation of railroading. Additionally, Ms. Gonzales will provide an overview of MxV Rail's transformation into new facilities and how the vision of the future will benefit railways globally.

Kari Gonzales

President & CEO, MxV Rail

Keynote Speaker

Wednesday, April 12, 2023 12:30 PM – 1:45 PM

Jannet Walker-Ford

Senior Vice President, National Transit and Rail Leader, WSP USA Inc.

Keynote Speaker

Thursday,
April 13, 2023
12:30 PM – 1:45 PM

2023 JOINT RAIL CONFERENCE WELCOME ADDRESS/PLENARY SESSION

Thursday, April 13, 2023 - 12:30 PM – 1:45 PM

Jannet Walker-Ford
Senior Vice President, National Transit and Rail Leader, WSP USA Inc.

Biography:
Jannet Walker-Ford is a nationally recognized transportation industry executive with WSP USA, a leading engineering and professional services consultancy. A tireless advocate for equity in transportation and the power of public transit to transform communities, Walker-Ford has more than two decades of diverse experience. Her expertise includes management consulting, technology, mobility, and transportation systems. She has served in an executive leadership capacity on programs and projects for large transit and transportation agencies across the U.S. and as the Deputy General Manager/Deputy CEO as well as the CIO at the Metropolitan Atlanta Rapid Transit Authority.

In her role with WSP, she serves as the senior vice president & national transit and rail business leader, responsible for leading and growing the firm's business in national transit and rail markets including the national practices for freight delivery, passenger rail, systems, technical project delivery, bus rapid transit and zero emissions.

She serves on multiple national boards including the current Chair of WTS International and the APTA Executive Committee and has received numerous awards recognizing her success and advocacy.

Presentation Title:
From Intelligent to Intentional Railroading

Abstract:
Railroads have always played a vital role in building strong economies and connecting our nation. A strong advocate for resilient, equitable and transformative transportation systems, Jannet Walker-Ford will discuss how intelligent railroading extends beyond technology to the intentional planning, design and delivery of railroad systems that strengthen communities, advance equity, and provide resilient, sustainable solutions for our transportation challenges.

Acknowledgments

The organizers thank each of the speakers, and track and session chairs for their willingness to freely share their knowledge and experiences with our attendees. Also, we thank the following individuals and the organizations that they represent, who generously volunteered many hours, their expertise and dedication in planning this year's event:

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Thank You!

WEDNESDAY, APRIL, 12

WELCOME ADDRESS
THE FUTURE OF RAIL
Loch Raven Room I **8:00am - 9:00am**

Eric Gebhardt, *Executive Vice President and Chief Technology Officer, Wabtec Corporation*

TRACK 2-1
ROLLING STOCK (SPONSORED BY ASME RTD)
Camden Room II **9:00am - 10:30am**

Chair: Timothy Mast, *Wabtec Corporation*

Air Brake Performance of Very Long Trains (VLT) Under Different Train Configurations

Extended Abstract: JRC2023-104077

Anand Prabhakaran, *Sharma & Associates, Inc.,* **Monique Stewart,** *U.S. DOT - FRA,* **Hamed Pouryousef,** *Sharma & Associates, Inc.,* **Gray Booth,** *Sharma & Associates, Inc.,* **Francisco Gonzalez,** *U.S. DOT- FRA,* **Srini Swamy,** *Sharma & Associates, Inc.,* **Som Singh,** *Sharma & Associates, Inc.,* **William Muth,** *Sharma & Associates, Inc.*

On-Board Measurement of Wheel Impact Load

Extended Abstract: JRC2023-104973

Matthew Witte, *MxV Rail,* **Yuqing Zeng,** *MxV Rail,* **Nicholas Wilson,** *MxV Rail*

Passenger Railcar Procurement Paradigms: Challenges and Opportunities

Extended Abstract: JRC2023-105108

Stuart F. Trout, *Independent Transportation Consultant*

Cold Weather Performance of Freight Car Air Brake Systems

Extended Abstract: JRC2023-105253

Elton Toma, *National Research Council Canada,* **Stephen Mackie,** *National Research Council Canada,* **Alok Jahagirdar,** *National Research Council Canada*

TRACK 1-1
TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Camden Room I **9:00am - 10:30am**

Chair: Dimitris Rizos, *University of South Carolina*

Vibration-Based Approach for the Estimation of the Neutral Temperature in Continuous Welded Rails

Extended Abstract: JRC2023-101305

Alireza Enshaeian, *University of Pittsburgh,* **Matthew Belding,** *University of Pittsburgh,* **Piervincenzo Rizzo,** *University of Pittsburgh*

Utilizing Automated Vertical Rail Deflection Measurement Technology to Quantify Soft Spot Risk and Prioritize Maintenance

Extended Abstract: JRC2023-102282

Christopher Hartsough, *Harsco Rail,* **Joseph Palese,** *University of Delaware,* **Todd Dragland,** *Genesee & Wyoming Railroad,* **Hugh Thompson,** *Federal Railroad Administration*

Field Implementation of Stereo Vision System for RNT and Longitudinal Stress Measurements in CWR Track

Extended Abstract: JRC2023-105481

Brittany Stinson, *University of South Carolina,* **Caio Penna,** *University of South Carolina,* **Brennan Gedney,** *University of South Carolina,* **Dimitrios Rizos,** *University of South Carolina,* **Michael Sutton,** *University of South Carolina*

Experimental Study on the Impact Resistance of High-Performance Cementitious Materials with Non-Metallic Fibers for Prestressed Concrete Crossties

Extended Abstract: JRC2023-105060

Changhoon Lee, *Western New England University,* **Moochul Shin,** *Western New England University*

TRACK 2-2
ROLLING STOCK (SPONSORED BY ASME RTD)
Camden Room II **11:00am - 12:30pm**

Chair: Brian Donohue, *WSP USA Inc.*

Geometric Contacts Between 3D Wheel-Rail Rigid Surfaces

Extended Abstract: JRC2023-104985

Jalil Rismantab-Sany, *Sharma & Associates. Inc.,* **Florentina Gantoi,** *Sharma & Associates, Inc.,* **Ali Tajaddini,** *U.S. Department of Transportation,* **Som Singh,** *Sharma & Associates, Inc.*

Investigating the Contributing Factors to VSR Wheel Failures in North American Freight Railways Using Finite Element Analysis

Extended Abstract: JRC2023-100929

Alejandro Alvarez, *Reyes, ENSCO, Inc.,* Steven Dedmon, *SLDedmon Consulting LLC,* Ron Gagnon, *SimuTech Group*

Investigation Into Vehicle/Track Interaction Resulting into Derailments in Turnouts

Extended Abstract: JRC2023-103082

Ulrich Spangenberg, *MxV Rail,* Adam Klopp, *MxV Rail,* Arun Wickramasuriya, *MxV Rail*

TRACK 5-1
ELECTRIFICATION AND TRANSIT SYSTEMS (CO-SPONSORED WITH APTA)
Camden Room I **11:00am - 12:30pm**

Chair: John Grantham, *Atkins Global*

Partial Electrification Strategies for Diesel Commuter Rail's Climate Challenge

Extended Abstract: JRC2023-101801

John G. Allen, *Independent Transportation Consultant,* Alex Lu, *Metro-North Commuter Railroad,* Stuart F. Trout, *Independent Transportation Consultant,* John P. Aurelius, *Independent Transportation Consultant*

Reversible Thyristor Control Rectifier: New Technology for Traction System

Extended Abstract: JRC2023-104724

Vitaly Gelman, *VG Controls,* Moustapha Ouattara, *WMATA*

Zero Emission Rail Traction Technologies Review: A Comparative Technical and Operational Assessment

Extended Abstract: JRC2023-105058

Fábio Coelho Barbosa, *FCB Research*

The 2021 Brazilian Rail Act as a Tool for Rail Deregulation: General Guidelines and Perspectives

Extended Abstract: JRC2023-105061

Fábio Coelho Barbosa, *FCB Research*

LUNCH AND KEYNOTE
RAILROADING INTO THE FUTURE
Harborview Ballroom I **12:30pm - 1:45pm**

Kari Gonzales, *President & CEO, MxV Rail*

TRACK 3-1
SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)
Camden Room I **1:45pm - 3:15pm**

Chair: David Thurston, *Canadian Pacific Railway*

Power Off! Challenges in Planning and Executing Power Isolations on Shared-Use Electrified Railways

Extended Abstract: JRC2023-101802

Alex Lu, *Metro-North Commuter Railroad,* Aleksandr Lukatskiy, *Metro-North Commuter Railroad,* Zhiqi Zhong, *Metro-North Commuter Railroad,* John G. Allen, *Independent Transportation Consultant*

On Tunnel Gas Detection and Deformation Monitoring (TGDDM)

Extended Abstract: JRC2023-103086

Anthony Ho, *University of Waterloo,* Pin-Han Ho, *University of Waterloo,* David Thurston, *Canadian Pacific Railroad,* Rick Shaw, *Canadian Pacific Railroad,* Shunde Yin, *University of Waterloo*

Leveraging Track Circuit Data to Monitor Assets and Improve Railroad Operations

Extended Abstract: JRC2023-105078

Jeff Fries, *Alstom*

TRACK 1-2
TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Camden Room II **1:45pm - 3:15pm**

Chair: Brennan Gedney, *University of South Carolina*

Generating Local Resonances in Free Rails with Piezoelectric Elements

Extended Abstract: JRC2023-104589

Yuning Wu, *University of Utah,* Keping Zhang, *University of Utah,* Peng Zhang, *University of Utah,* Ranting Cui, *University of Utah,* Xuan Zhu, *University of Utah*

Deep Autoencoder for Ultrasonic Guided Wave-Based Rail Defect Detection

Extended Abstract: JRC2023-104567

Yuning Wu, *University of Utah,* **Xuan Zhu,** *University of Utah*

Frontiers in Ultrasonic Rail Inspections: High-Speed Testing and Quantitative Hand-Held Verification

Extended Abstract: JRC2023-104987

Diptojit Datta, *University of California, San Diego,* **Chengyang Huang,** *University of California, San Diego,* **Ali Zare Hosseinzadeh,** *University of California, San Diego,* **Izabela Batista,** *University of California, San Diego,* **Francesco Lanza Di Scalea,** *University of California, San Diego*

2023 Grant Award – New Emerging Technology: Portable Laser Track Analyzer Device

Technical Presentation Only: JRC2023-109476

Peter Bartek, *PB Innovations, LLC*

NEW ROLLING STOCK TECHNOLOGY PANEL

Loch Raven Room I **3:45pm - 5:15pm**

Moderator: **Matthew Witte,** *MxV Rail*

Composites in the Railcar Industry

Panel Presentation: JRC2023-104773

Kenneth Huck, *Trinity Rail*

Onboard Impact Wheel Measurements

Panel Presentation: JRC2023-105494

Todd Snyder, *Amsted Digital Solutions*

Railroad Machine Vision and Inspection Integration

Panel Presentation: JRC2023-106826

Brian Yeager, *Norfolk Southern*

Freight Car Draft System Failure Trends

Panel Presentation: JRC2023-110745

Selva Karunakaran, *Union Pacific Railroad*

THURSDAY, APRIL, 13

CHALLENGES AND SOLUTIONS FOR SAFE OPERATION OF RAILROAD TRANSPORTATION PANEL

Loch Raven Room I **8:00am - 9:00am**

Moderator: **Jeremy Gernand,** *Penn State University*

Recent Testing and Modeling Related to Risk and Safety During Railroad Transportation of Spent Nuclear Fuel

Panel Presentation: JRC2023-109477

Nicholas Klymyshyn, *PNNL*

Experimental Investigation of Safety- and Risk-Related Decision Making

Panel Presentation: JRC2023-109588

Jeremy Gernand, *Penn State University*

TRACK 1-3
TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)

Camden Room I **9:00am - 10:30am**

Chair: Reza Naseri, *University of South Carolina*

Field Evaluation of Railway Dynamic Load Factors Through Instrumented Wheelset Measurements

Extended Abstract: JRC2023-101037

Danial Behnia, *University of Alberta,* **Michael Hendry,** *University of Alberta*

Experimental Investigation into the Relationship Between Track Stiffness Variations, Rail Defects, and Dynamic Rail-Wheel Forces Measured by Instrumented Wheelset

Extended Abstract: JRC2023-105616

Reza Mousapour, *University of Alberta,* **Parisa Haji Abdulrazagh,** *Matrix Engineering & Trading Ltd.,* **Mustafa Gul,** *University of Alberta,* **Michael Hendry,** *University of Alberta*

Dynamic Amplification of Transit Loads due to Derailment Impact

Extended Abstract: JRC2023-105630

Nicholas Catella, *Simpson Gumpertz & Heger,* **John Lobo,** *HDR,* **Robert MacNeill,** *Simpson Gumpertz and Heger,* **Glenn Gough,** *Siemens Mobility*

Estimating Dynamic Response and Characteristics of Steel Truss Railroad Bridges Under Service Train Excitation Using Laser Vibrometer and Accelerometers

Extended Abstract: JRC2023-105378

Celso de Oliveira, *University of Connecticut,* **Santosh Dhakal,** *University of Connecticut,* **Ramesh B. Malla,** *University of Connecticut*

TRACK 4-1
SAFETY ENGINEERING AND RISK ANALYSIS (CO-SPONSORED WITH ASME SERAD)

Camden Room II **9:00am - 10:30am**

Chair: Jeremy Gernand, *Penn State University*

Journal Bearing Developments for High Axle Load Applications

Extended Abstract: JRC2023-102286

Daniel Blasko,*The Timken Company,* **Anthony Lucas,** *The Timken Company*

Using Machine Learning to Quantify the Unbalanced Load Distribution's Effect on Wood Crossties' Condition

Extended Abstract: JRC2023-104819

Kenza Soufiane, *University of Delaware,* **Allan M. Zaremsbki,** *University of Delaware,* **Joseph Palese,** *University of Delaware*

Maximum Locomotive Horn Warning Time for Pedestrians Before Applying Passenger Train Emergency Brake

Extended Abstract: JRC2023-105558

Louis Rubenstein, *Forensic Engineering Institute*

Cell Phone Data Based Approach for Prevention of Trespass Casualties on Railroad Track

Extended Abstract: JRC2023-105671

Serkan Sandikcioglu, *ENSCO, Inc.,* **Radim Bruzek,** *ENSCO, Inc.,* **Gaylen Drape,** *ENSCO, Inc.,* **Kaycee Becker,** *ENSCO, Inc.,* **Joel Mcauliffe,** *ENSCO, Inc.,* **Jesse Torres,** *ENSCO, Inc.,* **Kevin Denelsbeck,** *ENSCO, Inc.,* **Katrina Smart,** *ENSCO, Inc.*

TRACK 3-2
SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)
Camden Room I **11:00am - 12:30pm**

Chair: **David Thurston,** *Canadian Pacific Railway*

A Case for Railyard Automation Using GPS Satellites

Extended Abstract: JRC2023-105377

Kshitij Saxena, *KS Consulting*

Conducting Efficient CBTC Capacity Analysis of Junctions Using Recovery as a Proxy Variable

Extended Abstract: JRC2023-103142

Dennis Page, *Hatch LTK,* **Ethan Call,** *Hatch LTK*

Why Make the Shift to CBTC?

Extended Abstract: JRC2023-109032

John Hofbauer, *WMATA*

TRACK 1-4
TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Camden Room II **11:00am - 12:30pm**

Chair: **Rakan Alturk,** *ENSCO, Inc.*

Infrared Thermography and Thermographic Signal Reconstruction for Rail Defect Detection

Extended Abstract: JRC2023-104595

Ranting Cui, *University of Utah,* **Yuning Wu,** *University of Utah,* **Keping Zhang,** *University of Utah,* **Xuan Zhu,** *University of California, San Diego*

Non-Contact Airborne Sonar Technology for In-Motion Tie Deflection Measurement

Extended Abstract: JRC2023-105064

Ali Zare Hosseinzadeh, *University of California, San Diego,* **Diptojit Datta,** *University of California, San Diego,* **Francesco Lanza Di Scalea,** *University of California, San Diego*

Application of Distributed Acoustic Sensing Technology for Continuous Track Condition Monitoring: Case Studies and Results

Extended Abstract: JRC2023-102526

Ashish Jain, *Sensonic GmbH,* **Amogh Shurpali,** *Sensonic GmbH*

LUNCH AND KEYNOTE
FROM INTELLIGENT TO INTENTIONAL RAILROADING
Harborview Ballroom I **12:30pm - 1:45pm**

Jannet Walker-Ford, *Senior Vice President, National Transit and Rail Leader, WSP USA Inc.*

TRACK 2-3
ROLLING STOCK (SPONSORED BY ASME RTD)
Camden Room II **1:45pm - 3:15pm**

Chair: **Timothy Mast,** *Wabtec Corporation*

Assessing the Efficacy of Railroad Bearing Reconditioning Through Service Life Performance Testing

Extended Abstract: JRC2023-104983

Constantine Tarawneh, *The University of Texas Rio Grande Valley,* **Veronica Hernandez,** *The University of Texas Rio Grande Valley,* **Javier Arroyo,** *The University of Nebraska-Lincoln,* **Heinrich Foltz,** *The University of Texas Rio Grande Valley,* **Dustin Clasby,** *MxV Rail*

Effect of Heat Sink Positioning on Viability of Thermoelectric Energy Harvesting on Railcar Bearing Adapters

Extended Abstract: JRC2023-105034

Danna Capitanachi Avila, *The University of Texas Rio Grande Valley,* **Kevin Quaye,** *The University of Texas Rio Grande Valley),* **Constantine Tarawneh,** *The University of Texas-Pan American,* **Heinrich Foltz,** *The University of Texas Rio Grande Valley*

Design and Implementation of a Load Sensor in a Bearing Adapter Assembly for Freight Railcar Applications

Extended Abstract: JRC2023-105122

Prince Mensah, *The University of Texas Rio Grande Valley,* **Constantine Tarawneh,** *The University of Texas Rio Grande Valley,* **Heinrich Foltz,** *The University of Texas Rio Grande Valley,* **Lee Cantu,** *Hum Industrial Technology, Inc.,* **Brent Wilson,** *Hum Industrial Technology, Inc.*

TRACK 1-5
TRACK SYSTEMS AND CIVIL INFRASTRUCTURES (SPONSORED BY ASCE)
Camden Room I **1:45pm - 3:15pm**

Chair: Serkan Sandikcioglu, *ENSCO, Inc.*

Track Geometry Inspection Data Analytics for Anomaly Detection Using Unsupervised Machine Learning Techniques

Extended Abstract: JRC2023-104954

Yueyan Gu, *Virginia Tech,* **Farrokh Jazizadeh,** *Virginia Tech*

Tie Reaction Measurement Under Static Loading Using Rail Mounted Strain Gauges

Extended Abstract: JRC2023-104964

Rakan Alturk, *ENSCO, Inc.,* **Md. Fazle Rabbi,** *Oklahoma State University,* **Radim Bruzek,** *ENSCO, Inc.,* **Theodore Sussmann,** *Volpe National Transportation Systems Center,* **Hugh Thompson,** *Federal Railroad Administration,* **Debakanta Mishra,** *Oklahoma State University*

Photoelasticity Topology Optimization Technique

Extended Abstract: JRC2023-105418

Avilasha BG, *Dayanandasagar College of Engineering,* **Ramakrishna Ds,** *Jawaharlal Nehru National College of Engineering*

TRACK 2-4
ROLLING STOCK (SPONSORED BY ASME RTD)
Camden Room I **3:15pm - 5:15pm**

Chair: Brian Donohue, *WSP USA Inc.*

Intermittent Electrification with Battery Locomotives and the Post-Diesel Future of North American Freight Railroads

Extended Abstract: JRC2023-101800

Alex Lu, *Metro-North Commuter Railroad,* **John G. Allen,** *Independent Transportation Consultant,* **John P. Aurelius,** *Independent Transportation Consultant*

Automatic Lightweight Structure Derivation for Rail Vehicles from Topology Optimization Results

Extended Abstract: JRC2023-102158

Christian Gomes Alves, *German Aerospace Center*

Application of Statistical Methods to Identify Faulty Vehicles

Extended Abstract: JRC2023-103507

Sven Scholz, *University of Technology Dresden,* **Joerg Schuette,** *University of Technology Dresden*

Model-Based-Systems-Engineering (MBSE) as a Gamechanger in the Development Process of Railway Vehicles

Extended Abstract: JRC2023-104755

Gregor Malzacher, *German Aerospace Center,* **Ehret Marc,** *Institute of System Dynamics and Control,* **Andreas Heckmann,** *German Aerospace Center*

TRACK 1-6
Track Systems and Civil Infrastructures (Sponsored by ASCE)
Camden Room II **3:15pm - 5:15pm**

Chair: Dimitris Rizos, *University of South Carolina*

State of the Art and Current Practice on Temperature-Induced Rail-Structure Interaction in North America

Extended Abstract: JRC2023-104130

Ying Tan, *HDR,* **John Lobo,** *HDR*

Automated Predictive Vehicle Dynamics Simulations for a Large-Scale Heavy Haul Network

Extended Abstract: JRC2023-105453

Cory Hogan, *ENSCO, Inc.,* **Yangbo Liu,** *ENSCO, Inc.,* **Yu Pan,** *ENSCO, Inc.*

Comparison of Coupling Methods for Rapid TTI Simulations

Extended Abstract: JRC2023-105489

Reza Naseri, *University of South Carolina,* **Arya Datta,** *University of South Carolina,* **Brennan Gedney,** *University of South Carolina,* **Dimitris Rizos,** *University of South Carolina*

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3-1 SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)

David Thurston, *Canadian Pacific Railway*

3-2 SIGNAL, COMMUNICATION, AND PTC SYSTEMS (SPONSORED BY IEEE)

David Thurston, *Canadian Pacific Railway*

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Jeremy Gernand, *Penn State University*

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John Grantham, *Atkins Global*

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Chair: Jeremy Gernand, *Penn State University*

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9. LOCH RAVEN GALLERY
10. LOCH RAVEN ROOM
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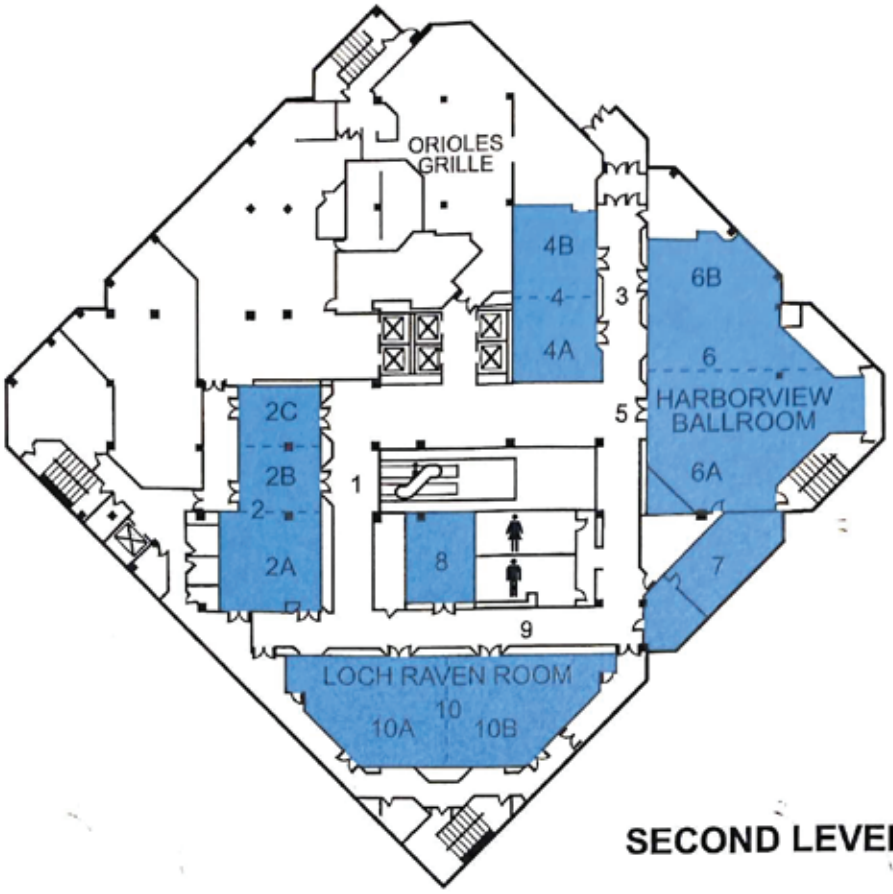

SECOND LEVEL

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