



Curriculum Vitae

Experience

Railroad & Metallurgical Engineering, Inc. (1997 - Present)

An engineering consulting practice focused on railroad engineering design, metallurgical engineering & expert witness consulting in accident reconstruction, railroad litigation & product liability. Also, projects and assignments in material/component failure analysis, railroad engineering, new product development & manufacturing process development.

Principal Engineer and Consultant

- Project Assignments for Clients and Litigation cases for both the plaintiff & defense include:
 - FELA and OSHA injury investigations involving component failure analysis and event recorder download analysis, as well as locomotive/equipment operation evaluation, including design, inspection, maintenance, and overhaul procedures.
 - Accident reconstruction analysis involving: railroad equipment (trains and MOW vehicles), including track inspection and rail failure analysis, trucks, automobiles, motorcycles, and pedestrians (determine the root cause and assemble supporting evidence)
 - Perform train derailment investigations & analysis, including site & track inspections.
 - Product liability investigations on a wide variety of metallurgical system/component designs and materials including: locomotives/railcars (platforms, handbrakes, engines, wheels, axles, horns, shocks/coil springs, welds) and non-transportation equipment.
 - Metallurgical engineering design of components in the steel, automotive, truck, and railroad industries. Analyses includes: stress/strain, material selection, mechanical properties, chemistry, heat treatment, manufacturing and failure analysis.
 - Diesel-electric locomotive and railcar design and operation analysis, including fuel consumption analysis, event recorder / fault log / data pack analysis, and rough-riding locomotive analysis. Railcar maintenance and defect analysis.
 - Locomotive fuel consumption testimony before the Surface Transportation Board (STB) on a number of occasions, including analysis, calculations, and fuel consumption projects.
 - Railroad equipment (locomotives, railcars, MOW) design, stress/strain analysis and failure analysis including design drawing evaluation, as well as adherence to design specifications and maintenance/repair procedures.
 - Failure Analysis performed on a wide variety of transportation equipment as well as other components made out of metallurgical materials.
 - Analysis of FRA, CFR, and GCOR rules and regulations and interpretation to determine adherence to these regulations in regard to accident reconstruction.
 - Railroad tank car design and leak/gasket analysis.

CAREER EXPERIENCE, CONTINUED**Horton Inc., Minneapolis, MN (1994-1997)**

A \$90 MM privately held company with almost 500 employees in three states. Divisions included Horton Industries Inc., a leading supplier of semi-truck fan clutches, and Horton Manufacturing Company Inc., a manufacturer of pneumatic clutches and brakes for industrial applications.

Vice President - R&D, Horton, Inc. (1996-1997)**Vice President - Engineering, Horton Industries (1994-1996)**

- Led product engineering efforts for current and new products for Horton Industries, then a \$60 MM division.
- Worked closely with the sales organization and customer accounts; orchestrated successful effort to reduce warranty problems through improved product design.
- Managed budgets up to \$3.5MM; oversaw up to 30 people in Minnesota and South Dakota.

GE Transportation Systems, Erie, PA (1981 - 1994)

A \$2 billion manufacturer of railroad locomotives; Division of General Electric.

Manager - Component Design and Product Engineering (1993 - 1994)

- Reported to Manager, Diesel Engine Operation, with dual responsibility for engine Component design and product engineering.
- Direct reports included six design engineers, reliability engineer, senior material engineer, test lab supervisor, and 12 associates, fuel/lubrication specialist and five product engineers.

Manager - Product Engineering (1989 - 1993)

- Reported to Manager of Engine Engineering, responsible for all aspects of diesel engine Product engineering, reliability, and quality.
- Oversaw product change staff of 12 including engineering, manufacturing, purchasing Supplier, quality, and drafting.
- Conducted new component design reviews before Division Chief Engineer, including reviews of FEA models, strain gauge testing, prototype bench testing and field testing.

Technical Leader - Component Design (1987 - 1989)

- Reported to the Manager of Engine Engineering. Supervised three design engineers in two locations. Conducted failure investigation of reliability issues; coordinated design improvement through all stages of development.

CAREER EXPERIENCE, CONTINUED**Senior Metallurgist (1981 - 1987)**

- Worked closely with vendors, purchasing, and supplier quality, involved in all manufacturing processes and material specification writing. Conducted materials analyses of failed components, in cooperation with customer service, marketing and railroad management.

The Bendix Corporation - Southfield, MI (1979-1981)

A supplier of automotive and truck components such as brakes and fuel pumps.

Senior Metallurgist - Engineering Development - Materials Department**The Chrysler Corporation, Highland Park, MI (1978 - 1979)**

A major automotive manufacturer.

Materials Development Engineer - Cast Metal Laboratory and Steel Development Group**St. Paul Technical Vocational Institute, St. Paul, MN (1976-1978)**

A community and technical college.

Instructor- Metallurgy and Testing Lab Classes**North Star Steel St. Paul, MN (1972-1976)**

A supplier of raw structural steel. Subsidiary of Cargill, Inc.

Quality Control technician & Project Metallurgist

Education**University of Minnesota Institute of Technology**

Bachelor of Science - Metallurgical Engineering (1974)

Graduate Coursework Metallurgical Engineering @ the University of Minnesota.

Graduate Coursework @ University of Michigan

Graduate MBA Coursework @ Gannon University.

Credentials and Affiliations

- Licensed Professional Engineer (PE-033313E), (1984 – Present)
- Minnesota Society of Professional Engineers (1997 – Present)
- National Society of Professional Engineers (1997 – Present)
- Certified Accident Reconstructionist (ACTAR # 1517) (2004 – Present)
- Adjunct Faculty, Material Science, Gannon University (1983-1993)
- American Society for Metals (ASM) (1978-present)
- American Foundry Society (AFS) (1997 – Present)
- Society of Automotive Engineers (SAE) (1994 – Present)
- Trained OSHA General Industry Regulations (2011 – Present)
- Adjunct Faculty, University of Wisconsin – Madison (2008 – 2009)

Lectures, Seminars and Publications

- “Locomotive Event Recorder Downloads”, presented at the **2020 EDR Summit** Houston, TX, March 9-11, 2020.
- “Railroad Forensics Seminar”, presented to the **Minnesota Society of Professional Engineers (MnSPE)**, St. Paul, MN, March 16, 2016
- “Derailment Investigation & Failure Analysis”, presented at the Annual Meeting, **National Association of Railway Safety Consultants and Investigators**, Indianapolis, IN, October 4-5, 2013.
- “MRRA Locomotive Retrofits”, **Midwest Regional Railroad Association**, Alexandria, MN, July 22, 2013
- “Locomotive Developments in Fuel Consumption, Emissions, & Hybrid Designs,” **National Association of Railway Safety Consultants and Investigators**, Chicago, IL, Sept. 20-21, 2012.
- “Locomotive & Equipment Investigations,” **National Association of Railway Safety Consultants and Investigators**, Minneapolis, MN, September 15-17, 2011.
- “Evidence Preservation Techniques”, presented at the **National Association of Railway Safety Consultants and Investigators**, Atlanta, GA, May 7, 2010.
- “Characteristics and Applications of Motive Power,” presented at **Freight Railroads: Best Operating Practices**, 3 Days at the University of Wisconsin – Madison, Sept 28 – 30, 2009.
- “Fire and Emergency Incidents (Railroads),” presented to the **Sherburne County Sherriff’s Office and Fire Departments**, July 23, 2009.
- “Characteristics and Applications of Motive Power,” presented at **Freight Railroads: Best Operating Practices**, 2 Days at the University of Wisconsin – Madison, Oct 21 – 22, 2008.
- “Railroad Forensics & Accident Investigation – CrashTeams Rail,” presented at CrashTeams Conference, Kamloops, BC, Canada, August 12 – 14, 2008.
- “Railroad Accident Forensics and Investigation by Railroad Litigation Experts”, **16th Annual Convention of the Academy of Rail Labor Attorneys**, Washington, DC, April 28, 2005.
- “Design and Handling of Remote Control Locomotives”, **National Association of Railway Safety Consultants and Investigators**, St. Louis, MO, May 6, 2005.
- “Diesel-Electric Locomotive Design Update” - Locomotive Design, Event Recorder Design, & Locomotive Fuel Consumption, **National Association of Railway Safety Consultants and Investigators**, St. Louis, MO, May 9, 2003.
- “Material Properties of Compacted Graphite Iron”, **Cutting Tool Magazine**, 2001.
- “Defense of Right of Way Fire Claims”, invited and presented at the **AAR Fall Claims Conference**, Hosted by Canadian National Railroad, Montreal, Canada, August 25-27, 1999.

- “Locomotive Design”, Annual Rail Seminar, **National Association of Railway Safety Consultants and Investigators**, Atlanta, GA, May 13-15, 1999.
- Material Science for Engineers, BS Semester Course, **Gannon University**, Erie, PA 1985-1993.

Educational Training, Courses, Seminars and Conferences

- “Midwest Rail Conference”, Michigan State University, Virtual, August 11-12, 2020.
- “2020 EDR Summit- Research, Collection, & Analysis”, **Crash Data Group**, Houston, TX, March 9-11, 2020.
- “Materials Retrospect: 100 Years of Advancement”, Material Science Annual Symposium, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 19, 2020.
- “Annual Railroad Meeting, **National Association of Railway Safety Consultants and Investigators**, Bryson City, NC, October 11-13, 2019.
- “Bi-Annual Seminar”, **Railway Interchange 2019**, sponsored by RSI, AREMA, REMSA, & RSSI, Minneapolis, MN, September 21-24, 2019.
- “Heavy Vehicle Event Data Recorder” Class, **ACTAR Training**, Appleton, WI, May 6-10, 2019.
- 24th Annual Research Review, **Association of American Railroads (AAR), Transportation Technology Center (TTCI)**, Colorado Springs, CO, March 25-27, 2019.
- 2019 EDR Summit- Research, Collection & Analysis”, **Crash Data Group**, Houston, TX, March 3-6, 2019.
- “Annual Railroad Meeting, **National Association of Railway Safety Consultants and Investigators**, Durango, CO, October 5-7, 2018.
- 25th Annual Wheel Rail Interaction Conference, **Wheel Rail Seminars**, Chicago, IL, May 2-3, 2018
- 23rd Annual Research Review, **Association of American Railroads (AAR), Transportation Technology Center (TTCI)**, Colorado Springs, CO, March 26-29, 2018.
- “Materials Characterization”, Material Science Annual Symposium, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 28, 2018.
- “Annual Meeting”, **American Short Line & Regional Railroad Association (ASLRRRA)**, November 13-17, 2017, Kansas City, MO.
- “Annual Meeting, **National Association of Railway Safety Consultants and Investigators**, Strasburg, PA, October 6-9, 2017
- “Bi-Annual Seminar”, **Railway Interchange 2017**, sponsored by RSI, AREMA, REMSA, & RSSI, Indianapolis, IN, September 16-19, 2017.
- “Failure Analysis”, Material Science Annual Symposium, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 22, 2017.
- “Annual Meeting, **National Association of Railway Safety Consultants and Investigators**, Altoona, PA, November 11-12, 2016
- “Annual Conference”, **Midwest Regional & Short Line Railroad Conference**, Grand Rapids, MN July 17-19, 2016
- “29th Annual Midwest Regional & Short Line Railroad Conference”, **Minnesota Regional Railroads Association**, Brainerd, MN July 17-19, 2016
- “Locomotive Air Brake Training Class”, **Wabtec**, Wilmerding, PA, November 17-20, 2015
- “Bi-Annual Seminar”, **Railway Interchange 2015**, sponsored by RSI, AREMA, REMSA, & RSSI, Minneapolis, MN, October 4-7, 2015.
- “Annual Conference”, **Midwest Regional & Short Line Railroad Conference**, Grand Rapids, MN July 13-15, 2015.
- “Annual Meeting, **National Association of Railway Safety Consultants and Investigators**, Scranton, PA, September 24-25, 2015.

EDUCATIONAL TRAINING, CONTINUED

- “22nd Annual Wheel Rail Interaction Conference”, **Wheel Rail Seminars**, Atlanta, GA, May 18-21, 2015
- “Train Air Brake Training Class”, **Wabtec**, Wilmerding PA, March 10-13, 2015
- “MATAI Conference”, **MwATAI**, St. Paul, MN, June 11-13, 2014.
- “Human Factors Class –Accident Reconstruction”, Jeffrey Mutthart, St. Paul, MN, June 9-10, 2014.
- “ARC-CSI Crash Conference”, Las Vegas, Nevada, June 2-5, 2014
- “Applied Physics for Collision Reconstruction”, **MwATAI**, Waterloo, Iowa, Nov. 11-15, 2013.
- “Annual Railroad Seminar,” **National Association of Railway Safety Consultants and Investigators**, Indianapolis, IN, October 4-5, 2013.
- “Bi-Annual Seminar”, **Railway Interchange 2013**, sponsored by RSI, AREMA, REMSA, & RSSI, Indianapolis, IN, September 29- October 2, 2013.
- “Annual Conference”, **Midwest Regional Railroad Association**, Alexandria, MN July 14-16, 2013
- “Annual Railroad Seminar,” **National Association of Railway Safety Consultants and Investigators**, Chicago, IL, September 20-21, 2012.
- “Derailment Causation Seminar”, **American Short line & Regional Railroad Association (ASLRRA)**, Teddy Maybrier, Minneapolis, MN, September 11-12, 2012
- “Regional Conference”, **American Short line & Regional Railroad Association (ASLRRA)**, Minneapolis, MN, September 9-11, 2012.
- “Annual Conference”, **Midwest Regional Railroad Association**, Two Harbors, MN, July, 2012.
- “Understanding and Complying with FRA213 Track Safety Standards”, **University of Wisconsin-Madison**, May 22, 2012.
- “CWR and Thermal Forces Workshop”, **University of Wisconsin-Madison**, May 21, 2012.
- “Annual Seminar”, **Railway Interchange 2011**, sponsored by RSI, AREMA, REMSA, & RSSI, Minneapolis, MN, September 18-21, 2011.
- “Annual Railroad Seminar,” **National Association of Railway Safety Consultants and Investigators**, Minneapolis, MN, September 15-17, 2011.
- “Failure Analysis,” Material Science Annual Seminar, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 23, 2011.
- “Human Factors for Traffic Accident Reconstruction,” **The Crash Safety Research Center**, Jeffrey W. Muttart, Amherst, MA, October 25 – 29, 2010.
- “Fall Technical Conference,” **ASME Rail Transportation Division**, Roanoke, VA, Oct 12, 2010.
- “Forensic Engineering: Engineers as Expert Witnesses, Case Studies, and Ethics,” **Minnesota Society of Professional Engineers** course at University of St. Thomas, April 8, 2010.
- “Emerging Legal Issues for Engineers,” **Minnesota Society of Professional Engineers** course at St. Thomas University, March 24, 2010.
- “Material Selection,” **American Society for Metals** Annual Seminar, February 24, 2010.
- “Railroad Operations: Best Practices,” presented at **University of Wisconsin – Madison**, September 28 – 30, 2009.
- “LMOA & Air Brake Association Meetings,” **Railway Supply Institute (RSI)**, Chicago, IL, September 16 – 18, 2009.
- “Corrosion,” Material Science Annual Seminar, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 18, 2009.
- “Railroad Operations: Best Practices”, **University of Wisconsin – Madison**, October 21 – 22, 2008.

EDUCATIONAL TRAINING, CONTINUED

- “Auto-Pedestrian Accident Investigation,” presented by **West Coast Accident Reconstruction Equipment and Education (We CARE)**, Vallejo, CA, April 20 – 24, 2008.
- “Heat Treating,” Material Science Annual Seminar, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 27, 2008.
- ASME (**American Society of Mechanical Engineers**) - ICED Conference and Meeting, Charleston, SC, October 15-17, 2007.
- Railroad Engineering Course, **University of Wisconsin Education and Training for the Rail Industry**, Madison, WI, October 8-10, 2007.
- ASME (**American Society of Mechanical Engineers**) -RTD-RSI (**Railway Supply Institute**) Joint Rail Conference, Chicago, IL, September 11-14, 2007.
- ACTAR- The Midwest Association of Technical Accident Investigators (MATAI) Conference & Meeting, St. Paul, MN, May 15-18, 2007.
- Annual Rail Seminar, **National Association of Railway Safety Consultants and Investigators**, St. Louis, MO, May 3-4, 2007.
- 12th Annual Research Review, **Transportation Technology Center (TTCI)**, & ASME Meeting, Pueblo, CO, March 11-15, 2007.
- Material Science Annual Seminar, **American Society for Metals (ASM)**, Hennepin County Technical Center, Brooklyn Park, MN, February 28, 2007.
- Expert Witness Course, (**SEAK**), Chicago, IL, December 1-2, 2006.
- Crash Data Retrieval Course, **Collision Safety Institute**, Warsaw, IN, October 9-12, 2006.
- **Locomotive Maintenance Officer’s Association Meeting (LMOA)**, & 98th Annual Convention and Technical Conference of the Air Brake Association, Railway Supply Institute (RSI), Chicago, IL, September 17-20, 2006.
- Rail 0107, Rail Accident Scene Investigation, **British Columbia Institute of Technology (BCIT)**, Vancouver, Canada, September 11-13, 2006.
- 11th Annual Research Review, **Association of American Railroads (AAR)**, **Transportation Technology Center (TTCI)**, Pueblo, CO, March 14-15, 2006.
- Material Science Annual Seminar, **American Society for Metals**, Hennepin County Technical Center, Brooklyn Park, MN, February 22, 2006.
- Annual Rail Seminar, **National Association of Railway Safety Consultants and Investigators**, St. Louis, MO, May 5-6, 2005.
- “Design of Railway Track Systems”, **University of Wisconsin Education and Training for the Rail Industry**, Rolling Meadows (Chicago), Illinois, May 4-5, 2005.
- 16th Annual Convention, **Academy of Rail Labor Attorneys**, Washington, DC, April 26-29, 2005.
- “North American Rail Mechanical Operations Seminar”, **Association of American Railroads**, March 28-30, 2005.
- Material Science Annual Seminar, **American Society for Metals**, Hennepin County Technical Center, Brooklyn Park, MN, February 23, 2005.
- 11th Annual Rail Liability Seminar, **Railroad Defense Bar**, Milwaukee, WI, July 15-16, 2004.
- Locomotive Maintenance Officer’s Association Meeting, & 96th Annual Convention and Technical Conference of the Air Brake Association, (LMOA), **Railway Supply Institute**, Chicago, IL, September 26-29, 2004.

EDUCATIONAL TRAINING, CONTINUED

- Passed ACTAR Exam for full accreditation as a Certified Traffic Accident Reconstructionist, Accreditation Commission for Accident Reconstruction, May 28, 2004. ACTAR # 1517
- Accident Reconstruction II, ACTAR Certification Course, **Northwestern University Transportation Institute**, Evanston, IL, April 12-23, 2004. I passed the Exam on April 23, 2004.
- Accident Reconstruction I, ACTAR Certification Course, **Northwestern University Transportation Institute**, Evanston, IL, April 26-30, 2004. I passed the Exam on April 30, 2004.
- Material Science Annual Seminar, **American Society for Metals**, Hennepin County Technical Center, Brooklyn Park, MN, February 25, 2004.
- Rail Transit Engineering Seminar, **University of Wisconsin Education and Training for the Rail Industry**, Madison, WI, February 9-10, 2004.
- “Annual Proceedings of the International Association of Railway Operating Officers, **Railway Supply Institute**, September 22-24, 2003.
- “95th Annual Convention and Technical Conference of the Air Brake Association, **Railway Supply Institute**, September 22-24, 2003.
- Annual Meeting and Seminar, **American Short Line and Regional Railway Association (ASLRRA)**, Philadelphia, PA, May 18-20, 2003.
- Locomotive Maintenance Officer’s Association Meeting, & 94th Annual Convention and Technical Conference of the Air Brake Association, (LMOA), **Railway Supply Institute**, Chicago, IL, September 22-25, 2002.

Thomas E. Johnson, P. E.

January 1, 2025