



NATIONAL TRANSPORTATION SAFETY BOARD
Investigative Hearing

Norfolk Southern Railway general merchandise freight train 32N
derailment with subsequent hazardous material release and fires,
in East Palestine, Ohio, on February 3, 2023

GROUP	A
EXHIBIT	
22	

Agency / Organization

ESi

Title

Biography of Hans Iwand



HANS C. IWAND, P.E.
PRINCIPAL & VICE PRESIDENT

Mr. Iwand is a mechanical/metallurgical engineer, with an engineering license in metallurgical engineering. He is a Vice President of Engineering Systems Inc. and manages the central region offices as well as being practice group director of the industrial testing laboratory, located in Norcross, Georgia.

With over 30 years of engineering experience, he has a broad area of specialization including failure analysis of systems, with the emphasis being on mechanical and metallurgical engineering systems and components. He has specific experience working in the areas of heavy industrial failure analysis of engine components, bearings, gears, shafts, weld failures, hose and hose fittings, fasteners, drive line components, corrosion mechanisms, plating and coatings, and component testing.

Typical areas of Mr. Iwand's work include: railroad derailment investigation, railroad rolling-stock evaluations, rail failure analysis, transportation accidents, automotive component failure analysis; industrial food process equipment, pumps, boilers, piping, heat exchangers, wind turbine gear boxes, gas turbine components, refrigeration compressors, decking & roofing failure analysis, plating evaluations, material selection, wear analysis of components, heat treating, welding of ferrous and non-ferrous components, braze and solder joints. In addition to failure analyses, Mr. Iwand has designed, fabricated, and conducted tests of many pieces of industrial equipment, implementing the measurement of force, stress/strain, temperature, and acceleration during the performance of the testing.

Mr. Iwand routinely works with industrial, insurance and legal industries. He has provided trial and deposition testimony on numerous occasions. He, as an owner and team member, has been involved in amateur racecar driving, as a designer, fabricator, and mechanic. Mr. Iwand has restored vintage automobiles including fabrication of components, sheet metal forming and welding of both aluminum and steel bodies.

Areas of Specialization

- Agricultural Equipment Failure Analysis
- Food Processing Equipment Failure Analysis
- Automotive Component Failure Analysis
- Transportation Accident Investigations
- Train Derailment Investigations
- Railcar Wheels, Axles, and Bearing Failure Analysis
- Railcar Truck Castings and Assemblies Failure Analysis
- Fixture and Test Design
- Instrumented Testing (Strain Gauge, Thermocouple, Accelerometer)
- Material Failure Analysis (hand tools, medical devices, switches, regulators, screens, valves)
- Heat Treatment Processes and Material Selection
- Weld Evaluations
- Systems Reliability Analysis

Education

- M.S., Mechanical Engineering, University of Nebraska-Lincoln, 1988.
- B.S., Agricultural Engineering, University of Nebraska-Lincoln, 1984.

Licensed Professional Engineer (P.E.)

State of Nebraska, License E-6926

Professional Affiliations/Honors

- Association of American Railroads (AAR)**
 Past Member and Chairman
 Wheels, Axles, Bearings and Lubrication (WABL) Subcommittee
- American Society of Mechanical Engineers (ASME)**
 Past Membership Chairman – Nebraska Chapter

Publications/Presentations

- "Failure Prevention through Life Assessment of Structural Components and Equipment", *ASM Handbook*, Volume 11A, July 2021.
- "Failure Analysis of an Aluminum Chiller Pipe by Experimental Simulation and Stress Analysis", *Journal of Failure Analysis and Prevention*, October 2017.
- "Fracture of Hex Bars During Manufacture", *Journal of Failure Analysis and Prevention*, August 2016.
- "Flash Butt Rail Weld Vertical Fractures", *Journal of Failure Analysis and Prevention*, January 2015.
- "Failure Analysis of Ethanol Vaporizer Heat Exchanger Tubes", *Journal of Failure Analysis and Prevention*, March 2013.
- "Failure Analysis of Open End Wrenches Containing Forging Defects", *Journal of Failure Analysis and Prevention*, (2010) 10:520-524.
- "Experimental Measurement and Finite Element Analysis of Screw Spike Fatigue Loads", *Proceedings of ASME/IEEE Joint Rail Conference* (JRCICE2007-40090).
- "Bonded Drive Failure – A Weibull Analysis," Case History, *The New Weibull Handbook*, 2nd Edition, July 1996.
- "A Thermal and Metallurgical Analysis of Martensite Formation and Tread Spalling During Wheel Skid," ASME Winter Conference, Rtd-Vol. 5, Rail Transportation, 1992.

American Society of Materials International (ASM)

Past Secretary, Treasurer and Chairman – Great Plains Chapter
Society of Automotive Engineers (SAE)
 Member

Positions Held

Engineering Systems Inc., Omaha, NE
 Principal & Practice Group Director 2013 – Present
 Senior Managing Consultant 2009 - 2012

RSI Materials Engineering/Rail Sciences, Inc., Omaha, NE

Vice President – Laboratory Services 2004 - 2009
 Assistant Vice President – Laboratory Services 2001 – 2004

Union Pacific Railroad Company, Omaha, NE

Director Locomotive Engineering and Quality 1997 – 2001
 Senior Manager Research and Development 1992 – 1997
 Manager Metallurgy Department 1989 – 1992

Failure Analysis Associates/Automotive Accident Reconstruction Group, Palo Alto, CA

Accident Reconstruction Engineer 1988 – 1989

U. of Nebraska Mechanical Engineering Graduate Engineering Program, Lincoln, NE

Metallurgical Engineering Graduate Student 1986 - 1987