



**HANS C. IWAND, P.E.**  
**PRINCIPAL**  
**DIRECTOR OF LAB AND INDUSTRIAL SERVICES**

[hciwand@engsys.com](mailto:hciwand@engsys.com)

Mr. Iwand is a mechanical/metallurgical engineer with Engineering Systems Inc. (ESi). He is a Principal, manages the Nebraska office located in Omaha, Nebraska, as well as the industrial testing laboratory (LIS) located in Norcross, Georgia.

With over 25 years of engineering experience, his areas of specialization are in analyzing systems failure analysis by implementing mechanical and metallurgical engineering methods. His experience includes railroad derailment investigation, railroad rolling-stock evaluations, rail failure analysis. In addition, heavy industrial failure analysis of: engine components, bearings, shafts, weld failure investigations, corrosion mechanisms, as well as, component testing.

Typical areas of work include: transportation accidents, automotive component failure analysis, industrial food process equipment, plant pumps, boilers, shafts, piping, weld quality evaluations, heat exchangers, plating evaluations, and instrumented testing including accelerations, temperatures and stress/strain of components within large industrial systems, i.e. nuclear power plants.

Mr. Iwand has had the opportunity to work within both the industrial and legal environments, and has provided trial testimony on numerous occasions. He has been involved in amateur racecar driving, as well as, designer, fabricator, and mechanic as an owner and team member, as well as vintage car restorer.

### **Areas of Specialization**

Derailment Cause Determination  
Railcar Wheels, Axles, and Bearings  
Railcar Truck Castings and Assemblies  
Material Failure Analysis  
Reliability Analysis of Systems  
Transportation Accident Investigations  
Weld Evaluations  
Automotive Component Failure Analysis  
Failure Analysis of Agricultural Equipment  
Food Process Equipment Failure Analysis  
Heat Treatment Processes and Material Selection  
Instrumented Testing (Strain Gage, Thermocouple, Accelerometer)  
Fixture and Test Design

### **Education**

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

*January 2019*



## **Licensed Professional Engineer (P.E.)**

State of Nebraska ..... License No. 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

### **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, Nebraska**

Principal & Practice Group Director, 2013 – Present  
Senior Managing Consultant – 2009 - 2012

### **RSI Materials Engineering/Rail Sciences, Inc., Omaha, Nebraska**

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

### **Union Pacific Railroad Company, Omaha, Nebraska**

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

### **Failure Analysis Associates/Automotive Accident Reconstruction Group, Palo Alto, California**

Accident Reconstruction Engineer, 1988 – 1989

### **University of Nebraska Mechanical Engineering Graduate Engineering Program**

Metallurgical Engineering Graduate Student, 1986 - 1987

## **Publications/Presentations**

"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", ASME/IEEE Joint Rail Conference (JRCICE2007-40090).

"Bonded Drive Failure – A Weibull Analysis," Case History, the new Weibull Handbook, 2<sup>nd</sup> 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.