Management of the Risk of Broken Rails: Theory and Practice

by Dr. Allan M. Zarembski
ZETA-TECH: A Harsco Rail Business Unit

MAY 3, 2012 TRABANT UNIVERSITY CENTER
3:30 PM RECEPTION (Trabant - Multipurpose Room A)
4:00 PM LECTURE (Trabant Movie/Lecture Theatre)

BIO

Dr. Zarembski is an internationally recognized authority in the fields of track and vehicle/track system analysis, railway component failure analysis, track strength, and maintenance planning. Dr. Zarembski is currently Vice President and General Manager of ZETA-TECH, an independent business unit of Harsco Rail. Prior to its acquisition by HTT in September of 2007, ZETA-TECH was an independent railway technical consulting and applied technology company, established by Dr. Zarembski in 1984. Prior to that he served as Director of R&D for Pandrol Inc., Director of R&D for Speno Rail Services Co. and Manager, Track Research for the Association of American Railroads.

Dr. Zarembski has a Ph.D. and M.A. in Civil Engineering from Princeton University, an M.S. in Engineering Mechanics and a B.S. in Aeronautics and Astronautics from New York University. He is a registered Professional Engineer in five states.

Dr. Zarembski is a member of AREMA (Honorary Member), ASCE and a fellow of ASME. He has been an Adjunct Assistant Professor at Illinois Institute of Technology and an Instructor at numerous Railroad Engineering short courses throughout the US. He served as Deputy Director of the Track Train Dynamics Program

and was the recipient of the American Society of Mechanical Engineer's Rail Transportation Award in 1992 and the US Federal Railroad Administration's Special Act Award in 2001.

Dr. Zarembski has authored or co-authored over 160 technical papers, over 120 technical articles, and two books "The Art and Science of Rail Grinding" and "Tracking R&D" both published by Simmons Boardman Books.

ABSTRACT

Rail defects and the risk of broken rails, and associated broken rail derailments, represents a major problem area in the railway industry today. In the US alone, there are over 250,000 rail defects found each year and over 300 broken rail caused derailments. The vast majority of these defects are fatigue based defects, where the defects initiate over time, and then propagate from barely detectable by current ultrasonic inspection technology to critical size where they will break under traffic loading. Risk management techniques have been developed to optimize the inspection process to increase the probability of finding these defects and significantly reducing the risk of a broken rail derailment.