



Department of Civil Engineering and Engineering Mechanics
Columbia University

Wednesday, December 21, 2011 (2:30-3:30 pm)

Schapiro 414

FUNDAMENTALS AND SELECTED TECHNICAL ISSUES OF HIGH SPEED AND HEAVY AXLE LOAD RAILROAD ENGINEERING



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ZETA-TECH

The railway industry has been the subject of evolution, technological innovation, and engineering for nearly 200 years. This evolution of the railway track, and its key components, has been paralleled by an evolution in railway engineering. This lecture presents an overview of railway track engineering to include both design engineering and maintenance engineering. The lecture also includes a discussion of the load environment to which track is subjected and which dominates railway engineering today. Among the engineering perspectives addressed are several of the major track problems and failure modes to include fatigue and associated failures of the rail, different rail fracture and failure modes, and thermal buckling failure of the track. Several derailment cases will be shown that illustrates several of these modes.

Biosketch

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. He is currently Vice President Strategic Projects 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 PhD 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 an Honorary Member of AREMA, a Fellow of ASME and a member of ASCE. 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 168 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.

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