

JOSEPH W. PALESE, M.C.E., P.E.
Senior Scientist

**palesezt@
udel.edu**

SUMMARY OF QUALIFICATIONS

Extensive experience in the area of railway track engineering, track maintenance management and planning, and computer modeling of track component degradation, failure, and overall behavior. Well versed in all aspects of computing and track maintenance planning for the railway industry. Strong foundation in railway research and inspection technology development. Project and employee management skills adapted through various research projects and new product development.

PROFESSIONAL HISTORY

9/2017 – Present **University of Delaware**
Senior Scientist

Development and management of independent, externally funded research programs for the Railroad Engineering and Safety Program to include research into track degradation, Big Data analysis of railroad condition, track failure and maintenance planning, and other related railroad areas.

2007 – 8/2017 **Harsco Rail**

Senior Director Engineering Analysis & Technology

Maintenance management and planning for railways and transit systems. Development of numerous software applications for the railway industry, including real time data acquisition, track component behavior modeling, planning and analysis models, database development and several other applications.

Development and implementation of inspection technologies on freight and passenger railways worldwide. Successful implementation of risk-based safety oriented software for ultrasonic testing requirements, rail replacement, track/train dynamics, etc.

Managed several Federal Railway Administration Broad Agency Announcement research projects, from proposal writing, contract negotiations, engineering and report writing.

Managed a staff of ten people in multiple disciplines of engineering and responsible for profit and loss of a \$2M+ business unit.

1990 - **ZETA-TECH Associates, Incorporated, Cherry Hill, New Jersey**
2007 *Vice President Engineering Analysis & Technology*

Development of software applications for the railway industry, including real time data acquisition, track component behavior modeling, planning and analysis models, database development and several other applications.

Development and implementation of software applications on freight and passenger railways worldwide. Successful implementation of risk-based safety oriented software for ultrasonic testing requirements, rail replacement, track/train dynamics, etc.

Responsible for software development and implementation group.

Instrumental in development and implementation of growth oriented strategies for consulting engineering through technology and innovation.

1988 -
1990

Graduate Research, University of Delaware

Advised by Dr. Arnold Kerr

Co-wrote a computer program for the Federal Highway Department on the blow-up of concrete pavements.

Masters thesis, Beams on Viscoelastic Foundations

June 1986 -
Sept. 1988
(Summer/Winter)

Adams Rehmann and Heggan Associates, Hammonton, New Jersey

Civil Engineer

Performed analysis and design for land subdivision including hydraulic analysis for stormwater management and road design. Estimation of quantities for land development.

SOFTWARE SKILLS

Proficient in all application of MS Office

Visual Studio: VB.Net, VC++

R Statistical software

Python

FORTRAN

EDUCATION

2018 Anticipated PhD of Civil Engineering – December, 2018 (ABD)
University of Delaware

1998 Master Business Administration
Rowan University

1990 Master of Civil Engineering
University of Delaware

1988 Bachelor of Civil Engineering
University of Delaware

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer: New Jersey

Member, American Railway Engineering Maintenance-of-Way Association

Member, TTCI Research Advisory Board – 2013 - 2017

HONORS AND AWARDS:

Recipient of the Davis Fellowship from University of Delaware
Member of Tau Beta Pi and Chi Epsilon honor societies
Recipient of AAR Fellowship in Railroad Engineering

PUBLISHED PAPERS:

1. Masters Thesis, "The Analysis of Structures Supported by Visco-Elastic Foundations", September 1990.
2. Zarembski, A. M., Palese, J. W., and Marten, J. H. "The Effect of Improved Rail Manufacturing Process on Rail Fatigue Life". American Railway Engineering Association, Bulletin 733, Volume 92, December 1991.
3. Zarembski, A. M., Palese, J. W., "Rail Maintenance Planning Using Computerized Rail Forecasting Models", Conference on Track Maintenance Practices on Suburban and Mass Transit Railways, Hong Kong, June 1993.
4. Zarembski, A. M., Holfeld, D. R., and Palese, J. W., "On the Derailment of Rail Vehicles Through Turnouts; A Review of Derailment Causes and Mechanisms". American Railway Engineering Association Turnout Symposium, Chicago, IL, August 1996.
5. Zarembski, A. M., Holfeld, D. R., and Palese, J. W., "Derailment of Transit Vehicles in Turnouts", Transportation Research Board Annual Meeting, Washington, D.C., Januar, 1997.
6. Palese, J.W., "SelecTie II Helps Railroads Make Solid Economic Designs", Crossties Magazine, May/June 1997.
7. Zarembski, A. M., Thornton, D., Palese, J. W., Forte, N., "Development and Implementation of RailGraph; "A Field Deployable Rail Maintenance Management Tool", American Railway Engineering Maintenance Association Annual Technical Conference, Accepted for Publication, 1998.
8. Palese, Joseph W., "RTA Introduces Tie Life Program", Crossties Magazine, May/June 1998.
9. Zarembski, A. M., Palese, Joseph, J. W., Katz, Leonid, "Implementation of a Dynamic Rail-Highway Grade Crossing Transition:, Transportation Research Board Annual Meeting, Washington, D.C., January 1999.
10. Palese, Joseph W., Holfeld, Donald R., "Tie Planning Tools for the Track Inspector", American Railway Engineering Maintenance Association Track & Structures Annual Conference, 1999.
11. Bonaventura, Clifford S., Palese, Joseph W., Zarembski, A.M., "Intelligent System for Real-Time Prediction of Railway Vehicle Response to the Interaction with Track Geometry", 2000 ASME/IEEE Joint Railroad Conference, April 2000.
12. Palese, Joseph W., Wright, Thomas W., "Application of a Risk Based Ultrasonic Test Frequency Scheduling System on Burlington Northern Santa Fe", TONE: Volume 5: Nondestructive Testing & Evaluation (NDT&E) for the Railroad Industry, 2000.
13. Palese, Joseph W., "Temperature Effects on Welded Rail", Live Stream, September/October 1998.
14. Palese, Joseph W., Wright Thomas W., "Risk-Based Ultrasonic Rail Test Scheduling on Burlington Northern Santa Fe", American Railway Engineering Maintenance Association Annual Technical Conference, 2000.
15. Palese, Joseph W., & Zarembski, Allan M., "BNSF Tests Risk-Based Ultrasonic Detection", published Railway Track & Structures Magazine, February 2001.
16. Zarembski, A.M., Palese, J.W., & Bell, J.G., "Limiting High Speed Dynamic Forces on the Track Structure; The Amtrak Acela Case", American Railway Engineering Maintenance Association Annual Technical Conference, September 2001.
17. Zarembski, A.M., Palese, J.W., Bell, J.G., "Controlling Track Forces during Introduction of New Height Speed Trains", International Railway Journal, October 2001.
18. Zarembski, A.M., Palese, J.W., & Katz, Leonid, "Reduction of Dynamic Wheel/Rail Impact Forces at Grade Crossings Using Stiffness Transitions", American Society of Mechanical Engineers, 2001 ImechE Congress, New York, NY, November 2001.

19. Palese, Joseph W., Wright Thomas W., "Risk-Based Ultrasonic Rail Test Scheduling on Burlington Northern Santa Fe", published The Permanent Way Institution – Journal and Report of Proceedings, 2001 Vol 119, Part 2
20. Zarembski, A.M., Parker, L.A., Palese, J.W., "Use of Comprehensive Tie Condition Data in Cross-Tie Maintenance Planning and Management on the BNSF", accepted for publication, American Railway Engineering Maintenance Association Annual Technical Conference, September 2002.
21. Zarembski, A.M., Parker, L.A., Palese, J.W., Bonaventura, C., "Computerized Tie Condition Inspection and Use of Tie Condition Data in Cross-Tie Maintenance Planning", International Heavy Haul Conference, May 2003.
22. Bonaventura, C.S., Palese, J.W., Zarembski, A.M., "Real-Time Prediction of Railway Vehicle Response to the Interaction with Track Geometry", International Heavy Haul Conference, May 2003.
23. Grissom, G.T., Palese, J.E., "Field Demonstration of the Use of Track Strength Data to Optimize Tie Replacement Requirements for High Speed Operations", published Crossties Magazine, Nov/Dec 2002.
24. Zarembski, A.M., Palese, J.W., "Risk Based Ultrasonic Rail Test Scheduling: Practical Applications in Europe and North America", Conference Contact Mechanics and Wear of Rail/Wheel Systems (CM2003), Gothenburg, Sweden, June 2003.
25. Bonaventura, C.S., Palese, J.W., Zarembski, A. M., "Field Evaluation and Deployment of a Track Geometry Car Based Real-Time Dynamics Simulator", AREMA 2003 Annual Conference & Exposition, Chicago, IL, October 5-8, 2003.
26. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., Holfeld, D.R., "Increasing Speeds through the Diverging Route of a Turnout without Increasing Lead Length", 83rd TRB Annual Meeting, Washington, DC, January 11-15, 2004.
27. Bonaventura, C.S., Palese, J.W., Zarembski, A.M., "Performance of a Track Geometry Car-Real-Time Dynamics Simulator using Multiple Vehicle, 2003 ASME International Mechanical Engineering Congress and Exposition (IMECE'03), Washington, DC, November 16-21, 2003.
28. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., Holfeld, D.R., "Increasing Speeds through the Diverging Route of a Turnout Without Increasing Lead Length, Railway Track & Structures, July 2004
29. Palese, J.W., Euston, T. L., Zarembski, A.M., "Use of Profile Indices for Quality Control Grinding", AREMA 2004 Annual Conference & Exposition, Nashville, TN, September 19-22, 2004.
30. Bonaventura, C.S., Zarembski, A. M., Palese, J.W., "TrackSafe: A Track Geometry Car Based Real-Time Dynamics Simulator", ASME 2005 Joint Rail Conference, Pueblo, CO, March 16-18, 2005.
31. Palese, J.W., Zarembski, A.M., "Practical Applications of Risk Based Ultrasonic Rail Test Scheduling in Europe and North America, Asset Management for Railway Infrastructure Asia 2005, Singapore, February 23-24, 2005.
32. Zarembski, A.M., Palese, J.P., "Assessing and Managing Risk on the Railway Track", International Railway Journal, May 2005.
33. Zarembski, A.M., Palese, J.P., Euston, T.L., "Monitoring Grinding Effectiveness Using Grinding Quality Indices", Railway Track & Structures, June 2005
34. arembski, A.M., Palese, J.P., "Characterization of Broken Rail Risk for Freight and Passenger Railway Operations", 2005 AREMA Annual Conference, Chicago, IL, September 25-28, 2005
35. Bonaventura, C.S., Holfeld, D.R., Zarembski, A.M., Palese, J.P., "Test Results of a Modified Turnout Designed to Increase Diverging Route Speeds Without Increasing Lead Length", 2005 AREMA Annual Conference, Chicago, IL, September 25-28, 2005
36. Zarembski, A.M., Euston, T.L., Palese, J.W., "Use of Track Component Life Prediction Models in Infrastructure Management", AusRail Conference and Exhibition, Sydney, November 2005
37. Zarembski, A.M., Palese, J.W., "Management of Broken Rail Risk" ("Gestion du risqué de rupture du rail"), LeRail, January 2006

38. Zarembski, A.M., Palese, J.W., Bonaventura, C.S., "Use of Hand Held Computers (PDAs) for Track Inspection and Maintenance" ("Utilisation d'ordinateurs de poche (PDA) pour le contrôle et la maintenance des voies"), LeRail, February/March 2006
- 39.
40. Zarembski, A.M., Palese, J.W., "Managing Risk on the Railway Infrastructure", World Congress of Railroad Research, Montréal, Canada, June 2006
41. Zarembski, A.M., Bonaventura, C.S., Palese, J.W., "Real Time Analysis of Track Geometry to Control Derailment Risk", Rail Quarterly/LeRail, June 2006
42. Zarembski, A.M., Palese, J.W., Euston, T.L., "Using Real Time Quality Control to Manage Rail Grinding", interface The Journal of Wheel/Rail Interaction (www.interfacejournal.com/features/07-06), July 2006
43. Zarembski, A.M., Gauntt, J.C., Grissom, G.T., Palese, J.W., "Field Demonstration of the Use of Track Strength Data to Optimize Tie Replacement Requirements", AREMA 2007 Annual Conference & Exposition, Chicago, IL, September 2007
44. Zarembski, A.M., Palese, J.W., "Use of Risk Management in Improving Track Safety", AREMA 2007 Annual Conference & Exposition, Chicago, IL, September 2007
45. Palese, J.W., Maurice, P. "The Drone – An Unmanned Chase Tamper", AREMA 2007 Annual Conference & Exposition, Chicago, IL, September 2007
46. Zarembski, A.M., Palese, J.W., "Improving Track Safety with New Generation Risk Management Tools", Railway Track & Structures, September 2007
47. Palese, J.W., Zarembski, A.M., "The Economics Of Heavy Axle Loads: Costs, Benefits, And Engineering Issues", ExpoRail 2007, India, October 2007
48. Zarembski, A.M., Palese, J.W., "Improving Track Safety with New Generation Risk Management Tools", RT&S Risk Management Conference, March 2007
49. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., "Switch and Crossing Inspections and Maintenance Management Using Handheld Computers", 4th IET International Conference on Railway Condition Monitoring (RCM 2008), Derby, UK, June 2008
50. Palese, J.W., Zarembski, A.M., "A Total Rail Maintenance Strategy for HAL Railways", IPWE, India, 2010.
51. Zarembski, A.M., Palese, J.W., "Evaluation of the Effectiveness of Rail Grinding on Reducing Rail Defects on North American Class 1 Railroad", AREMA 2010 Annual Conference and Exposition, Orlando, FL, August 2010
52. Zarembski, A.M., Palese, J. W., "Does Rail Grinding Reduce Rail Defects", RT&S, February 2011
53. Zarembski, A.M., Euston, T.E., Palese, J.W., "Development, Implementation, and Validation of an Automated Turnout Inspection Vehicle", IHHA 2011, Calgary, Canada, June 2011
54. Bonaventura, C.S., Zarembski, A.M., Palese, J.W., "Determination of Optimum Intervention Time for Track Surfacing Based on Economic Minimization of Maintenance Costs", IHHA 2011, Calgary, Canada
55. Zarembski, A.M., Palese, J.W., Euston, T.L., Scheiring, W.R., "Development and Implementation of Automated Switch Inspection Vehicle", 2011 AREMA Annual Conference, Minneapolis, MN, September 2011
56. Euston, T.L., Zarembski, A.M., Hartsough, C.M., Palese, J.W., "Analysis Of Wheel-Rail Contact Stresses Through A Turnout", 2012 ASME Joint Rail Conference, Philadelphia, PA, April 2012

57. Palese, J.W., Zarembski, A.M., Hartsough, C.M., Ozturk, S., “Use of Switch Profile Data for Enhanced Analysis of Wheel Rail Behavior at the Switch Point”, Proceedings of the 2015 IHHA Conference, Perth, Australia, June 2015.
58. Palese, J. W. and Zarembski, A. M., “Rail Grinding for Rail Transit Systems” 'Engineering' a Journal of the Chinese Academy of Engineering (CAE). Accepted for publication December 2015.
59. Hartsough, Christopher M., J. Palese, G. Schmitzer, J. Espindola, and T. Viana, “Optimized Rail Grinding Through Dynamic Positioning and Powering of Grinding Motors.” Proceedings of the 2016 Joint Railway Conference. Columbia, SC, April 2016
60. Palese, J., C.M. Hartsough, G. Schmitzer, et al., “Rail Lifecycle Improvement through the Application of Dynamic Grind Pattern Generation on a Heavy Haul Railroad in Brazil.” Proceedings of the AREMA 2016 Annual Conference & Exposition. Orlando, FL, August 2016
61. Hartsough, C., Zhang, J., Palese, J.W., DiVentura, S. (2017). “A method for the measurement and efficient removal of rail corrugations for the subsequent reestablishment of profile” Proceedings of the ASME.IEEE 2017 Joint Rail Conference. Philadelphia, PA, USA.
62. Palese, J.W., Zarembski, A.M., Hartsough, C.M., Thompson, H., Palese, M.E., (2017). “A study on subgrade pressure differential over regions of known substructure transitions as it related to track geometry.” Proceedings of the ASME.IEEE 2017 Joint Rail Conference. Philadelphia, PA, USA.
63. Palese, J.W., DiVentura, S., Hill, K., Maurice, P., (2017). “Optimizing tamper efficiency through the integration of inertial based track geometry measurement.” Proceedings of the ASME.IEEE 2017 Joint Rail Conference. Philadelphia, PA, USA.
64. Hartsough, C.M., Palese, J.W., DiVentura, S., Zhang, J. (2017). “An advanced methodology for developing grinding patterns to efficiently address corrugation removal and establish profile” Proceedings of the 2017 IHHA Conference. Cape Town, South Africa.
65. Hartsough, C.M., J. Palese, G. Schmitzer, J. Espindola, T. Viana, R. Santos, “Dynamic grind pattern generation and long term profile sustainability when applied to a heavy haul rail line.” Poster Presentation, 2017 IHHA Conference. Cape Town, South Africa.
66. Palese, J.W., Newman, G.R., Farritor, S., Hartsough, C.M., (2017). “Quantifying Track Substructure Performance Using Continuous and Autonomous Vertical Track Deflection Data” Proceedings of the 2017 IHHA Conference. Cape Town, South Africa.
67. Zarembski, A.M., Palese, J.W., Euston, T.L., Transportation Infrastructure Geotechnology, “Correlating Ballast Volume Deficit with the Development of Track Geometry Exceptions Utilizing Big Data Science Algorithm”, April 2017.
68. Palese, J. W., Harsough C. H., Zarembski A. M., Thompson, H., Ling, H. L. Pagano. W. , “ Life Cycle Benefits of Subgrade Reinforcement Using Geocell on a High Speed Railway- A Case Study”, **American Railway Engineering Association Annual Conference**, Indianapolis, IN, September 2017
69. Zarembski, A. M., Yurlov, D., Palese J. W., Attoh-Okine N, and Thompson, H, “Relationship between Track Geometry Degradation and Subsurface Condition as Measured

by GPR”, American Railway Engineering Association Annual Conference, Chicago, IL, September 2018

70. Palese, J. W., Zarembski, A. M. and Attoh-Okine, N, “ Development and Application of a Next Generation Rail Wear Model”, American Railway Engineering Association Annual Conference, Chicago, IL, September 2018
71. Yurlov, D, Zarembski, A. M., Attoh-Okine, N, and Palese, J. W., “Combinational Hybrid Analysis Approach to the Determination of a Probability Model for Development of Track Geometry Defects as a Function of Ground Penetrating Radar Measurements”, submitted to Journal of Transportation Infrastructure Geotechnology, June 2018
72. Palese, J. W. and Zarembski, A. M., “Methods for Aligning Near Continuous Railway Track Inspection Data”, submitted to Proc IMechE Part F: Journal of Rail and Rapid Transit, July 2018