Robert W. Halstead

Railroad Signal and Accident
Reconstruction Expert
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Skillset:

Railroad Crossings and/or Signals:

- A.S. – Engineering Science, B.S. - Electrical Engineering.
- Formerly employed by a large Northeastern Class I railroad as a signal circuit designer at System Engineering HQ, designing both rail/highway grade crossing warning systems and wayside signal systems (signals that the trains operate by).
- As Supervisor of Signal Construction, supervised the installation of active warning devices (flashers and/or gates) at over 200 rail/highway grade crossings throughout the Northeast. Also exerted project management and/or supervision over wayside signal installation and modification projects, including the installation of MicroCode I and II (cab signals without wayside) on a 187-mile long mainline. Represented the railroad on numerous "diagnostic teams" with state representatives, during which warning device upgrade needs were assessed and preliminary designs were devised and approved. Planned and conducted extensive "service testing," whereby new signal systems were verified to operate safely and placed in service.
- As Supervisor of Signal Maintenance, supervised signal maintainers, technicians, and inspectors responsible for the maintenance and Federally-required testing of computer-controlled, mission-critical signaling and train control systems, encompassing 400 route-miles, 27 interlockings, and over 400 rail/highway grade crossings.
- Worked closely with the Operations Dept. to facilitate train operations during the normal course of business and in crisis situations. Investigated accidents (including at crossings) when required and prepared detailed reports on findings.
- Trained Signal Dept. personnel system-wide on proper maintenance, inspection and testing procedures. Attended technical seminars given by signal equipment manufacturers and taught

seminars for Signal Dept. personnel on the latest electronic and computer-controlled signaling systems.

- Actively test both crossing and wayside signals systems post-accident to determine conformance with Federal and State statutes and regulations, as well as generally-accepted industry practice.
- Familiar with Federal Railroad Administration standards for signal system design, inspection, testing, and maintenance, as set forth in 49 CFR Parts 234, 235 and 236, and AREMA (American Railway Engineering and Maintenance of Way Association) Recommended Practices.
- Familiar with light rail signaling systems and electrified (catenary and third-rail) territory
- Have been consulted by the National Transportation Safety Board (NTSB) for technical assistance in determining accident causation.

Railroad Accident Reconstruction:

- Fully accredited by the Accreditation Commission for Traffic Accident Reconstruction (ACTAR) as a Traffic Accident Reconstructionist (No. 1285) since 2002. ACTAR is the highest accreditation in Accident Reconstruction, and requires the passage of an 8-hour, closed book exam and continuous education to maintain. ACTAR accreditation is recognized by:

International Association of Accident Reconstruction Specialists	*Society of Accident Reconstructionists*
American Society of Safety Engineers	*Michigan State Police*
National Association of Professional Accident Reconstruction Specialists	*Pennsylvania State Police*
National Association of Traffic Accident Reconstructionists and Investigators	*Colorado State Patrol*
Canadian Association of Technical Accident Investigators and Reconstructionists	
Midwest Association of Technical Accident Investigators	*Ontario Provincial Police*
Southwestern Association of Technical Accident Investigators	*Oregon State Police*
University of Central Missouri	*South Carolina Highway Patrol*
Forensic Accident Reconstructionists of Oregon	*Massachusetts State Police*
Illinois Association of Technical Accident Investigators	
Maryland Association of Traffic Accident Investigators	
New Jersey Association of Accident Reconstruction Specialists	
New York Statewide Traffic Accident Reconstruction Society	
Texas Association of Accident Reconstruction Specialists	
Washington Association of Technical Accident Investigators	
California Association of Accident Reconstruction Specialists	
Denver Research Institute at the University of Denver	

- Have investigated and/or reconstructed railroad-related accidents across the U.S., including but not limited to:
  o Impacts between trains and vehicles at rail/highway grade crossings
  o Impacts between trains and railroad employees or pedestrians at rail/highway grade crossings, on bridges, or at other points along the right-of-way
  o Impacts between trains and maintenance-of-way equipment
  o Impacts between vehicles and maintenance-of-way equipment at crossings
  o Collisions between trains (head-on, rear-end, and sideswipe)
  o Derailments

- o Passenger platform gap accidents
- o Railroad employee on-the-job injuries (FELA)
- o Determinations of adequacy of active warning devices at rail/highway grade crossings
- o Determinations of adequacy of available signage and sight distance at rail/highway grade crossings that do not have active warning devices (no flashers or flashers/gates)
- o Time studies of signal maintainers as they perform specific signal inspection, testing, and maintenance activities
- Past President: *National Association of Railroad Safety Consultants and Investigators* (NARSCI)
- Lecture across the U.S. on a continuing basis to railroad accident reconstruction organizations and law enforcement agencies, including the Pennsylvania State Police and CAARS (California Accident Reconstruction Society – lecture sponsored by the California Highway Patrol and LAPD).
- Trained and accredited in the acquisition and analysis of data from Event Data Recorders (EDR) from highway vehicles and its application to the overall accident reconstruction.
- Examine data downloaded from locomotive event recorders – determine when horn was sounded and brakes applied relative to impact.
- Trained in the acquisition and analysis of cellular telephone data records and their integration with GPS and other time-based data, including locomotive and signal system-based data sources.
- Maintains an electronic archive of thousands of accident and research reports , many of which do not exist on the Web, extending to over 500,000 pages, all of which are full-text searchable by keyword, and useable to support detailed expert opinions in a wide variety of cases.
- Recognized by the court as an expert in human factors of motorists as they approach rail/highway grade crossings (including perception-reaction time, perception and recollection of speed, time, and distance).
- Devised and constructed a measuring rig for measuring train to platform gap distance, even without a train present. This data, taken at fixed intervals along the platform, can be imported into a computer program to determine the largest likely gap at any point along the platform.
- Has worked many of the largest and most complex forensic railroad accident investigations and reconstructions in North America, including:
- o Chatsworth CA (head-on collision between freight and passenger train with 25 fatalities and 100+ injuries)
- o Washington D.C. WMATA Ft. Totten (rear-end collision between two commuter trains with 9 fatalities and 50+ injuries)
- o Graniteville SC (collision, derailment, hazmat release with 9 fatalities and 500+ injuries),
- o Fox River Grove (commuter train struck school bus, 7 fatalities and 20+ injuries)
- o Bourbonnais IL (Amtrak train struck semi-truck, 11 fatalities and 100+ injuries)
- Has been retained by both civil plaintiffs and defendants, including railroads, railroad construction and maintenance contractors, insurance companies, signal and locomotive equipment suppliers, and signal maintenance contractors. Has also been retained in criminal matters.

Railroad Employee Injuries (FELA) and OSHA:

- Trained and supervised field employees as to safe work practices on a continuing basis. Counseled employees when unsafe work practices were observed. Principal areas of safety-related instruction given included, but were not limited to, use of hand tools and heavy machinery, lifting and transporting material with boom trucks, working in excavations, elevated places , and proper work zone protection against highway and/or train traffic. Trained and supervised employees engaged in both low and high electrical work, proper lockout/tagout procedures, and required personal protective equipment.
- Investigated employee injuries and devised corrective action.
- While with IWT, have investigated and reconstructed a wide range of employee injury and fatality cases across virtually all railroad operating departments.
- Familiar with OSHA regulations and how they apply to the rail industry.
- Completed 30-hour OSHA training courses
- Previously certified by the North American Board of Certified Energy Practitioners (NABCEP) as a "PV [Photo Voltaic Energy System] Installer." This certification requires extensive training on the National Electric Code (NEC), the National Electric Safety Code (NESC), and the passage of a four-hour closed book examination.

Photography, Video, and Computer-Generated Animation:

- Over 35 years of experience in still photography in a variety of formats, former owner of an aerial photography company.
- Have lectured to fellow forensic accident reconstructionists on both photographic and video-based evidence collection techniques.
- Have shot VHS, SVHS, MiniDV, Betacam SP analog video. Currently shoot digital video in both 4:3 720p, 16:9 HD 1080p and 4k formats.
- Use digital video to precisely time and simultaneously record as evidence crossing flasher/gate operation.
- Have shot gyro-stabilized video from the ground and onboard moving trains and hyrail vehicles.
- **Use a FARO 3D Scanner to create accurate scale 3D replications of accident scenes** – import the resulting "point cloud" into a variety of animation software for accident sequence visualization.
- Use **drones** to capture aerial views of scene and generate detailed 3D replicas of accident scenes
- Use Photomodeler Scanner to create accurate three dimensional models of damaged locomotives, rolling stock, and highway vehicles from photographs. Also create three dimensional models of complete accident scenes, including crossing surface condition and surrounding vegetation.
- Analyze locomotive video for timing and evidence of manipulation.

- Have had video and animated footage used by the National Transportation Safety Board (NTSB) for crash analysis, and presented by NTSB at its final Public Hearing on the accident in Washington, D.C.
- Create finished video productions for use at trial in IWT's in-house editing suite using Adobe Premiere.

Statistical Analysis:

- Well versed in the use of Microsoft Excel for data collection and assimilation, interpolation, graphing, and statistical analysis.
- Well versed in, and have taught college-level courses in, the construction of Relational Database Management Systems (RDBMS) using Microsoft Access, coded in Access Basic (a superset of Visual Basic) to create commercial grade, efficient, high volume throughput data analysis systems. Can migrate Access database to SQL Server when required.
- Have created and maintain Access databases of Federal Railroad Administration (FRA) Accident/Injury data from 1975 to present, and can perform statistical analysis and create data subsets using any combination of search criteria at a level far exceeding that available on FRA's website.
- Have created and maintain Access databases of Federal Railroad Administration (FRA) False Proceed Signal and Crossing Activation Failure data from 1995 to present, and can perform statistical analysis and create data subsets using any combination of search criteria at a level far exceeding that available on FRA's website.
- Have constructed custom Access databases for locomotive fuel consumption studies, from importing text-based source data to the daily creation and delivery of high-level reports and graphs.

Legal Services:

- Assist Counsel in initial determination of case viability
- Prepare detailed list of discovery items required
- Prepare detailed list of interrogatories
- Assist Counsel in preparing to take opposing fact witness and expert witness depositions
- Attend opposing expert depositions, if requested, to offer instantaneous evaluation and generate additional questions based on expert responses
- Prepare affidavits and Expert Report
- Create demonstrative evidence for trial, including drawings, PowerPoint presentations, and video and computer animation, if requested
- Experienced in deposition and trial settings, present well to juries
- Cost effective

Published Works:

- *IronWood Guide to Railway Safety* – CD-ROM Series (Editor-in-Chief) (1998-2000)
- *Encyclopedia of Forensic Sciences*, 2nd Edition by Elsevier Press – London (2013) – contributed Chapter 147 *Railroad Accident Investigation and Reconstruction*
- *Railroad/Highway Grade Crossing Active Warning Device Activation Failures Due to Loss of Shunt: Recent Causes and Strategies for Mitigation* (2014) – published by Transportation Test Center Inc. (TTCI) Pueblo, CO, for end clients Association of American Railroads (AAR) and the Federal Railroad Administration (FRA).

Radio and Television Interviews:

- WOR Radio (NYC) - *The John Gambling Show*
- 1010 WINS Radio (NYC)
- KCRW Radio (Los Angeles)
- National Public Radio – show *Where We Live with John Dankosky*
- Fox News *Good Morning New York* (NYC)
- History Channel – on-screen narrator on five episodes of series *Engineering Disasters*
- NBC TV – *NBC Nightly News with Lester Holt*
- MSNBC – *Live with Thomas Roberts*
- Reuters TV
- CNN *Newsroom With Carol Costello*
- CNN *The Lead with Jake Tapper*
- Fox News – *The Kelly File*
- Fox News – *Fox & Friends First Phoner*
- Fox News – *Your World with Neil Cavuto*
- Fox Business Network – *Risk & Reward*
- *McNeil Lehrer News Hour*
- ABC News – *20/20*
- BBC (British Broadcasting Corporation)
- WNBF TV – *Binghamton Now with Bob Joseph*
- WMAL 105.9 – Washington DC

Newspaper and Print Publication Interviews:

- New York Times
- Wall Street Journal
- Washington Post
- Bloomberg News

- National Geographic
- Scientific American
- Independent Global News
- Orlando Sentinel
- LA Times
- NorthJersey.com
- Webmarked News
- Cumberland Times News
- Numerous others

Other Organizations and Qualifications (Past and/or Present):

- Institute of Electrical and Electronics Engineers (IEEE)
- Institute of Transportation Engineers (ITE)
- Transportation Research Board (Friend of the Board)
- National Association of Railroad Safety Consultants and Investigators (NARSCI) – member of Peer Review Committee, Vice President, Executive Vice President, President (2007-2014)
- New York State Traffic Accident Reconstruction Society, Inc. (NYSTARS)
- National Association of Professional Accident Reconstruction Specialists (NAPARS)
- National Association of Traffic Accident Reconstructionists and Investigators (NATARI)
- Toastmasters International (Area Governor 1999-2000)
- American Mensa, Ltd.
- FAA Licensed Private Pilot under 14 CFR Part 61
- FAA Licensed UAS (Unmanned Aerial System) Pilot under 14 CFR Part 107