Carolina Conductor

Volume 11 Number 4 **Monthly Newsletter of the Carolina Railroad Heritage Association, Inc.** © April 2024

Preserving the Past
Active in the Present
Planning for the Future

Web Site: hubcityrrmuseum.org
Facebook: Carolina Railroad Heritage Association & Hub City RR Museum

Hub City Railroad Museum and SOU Rwy Caboose #X3115:
Spartanburg Amtrak Station
298 Magnolia Street
Spartanburg, SC 29301-2330
Wednesday 10-2 & Saturday 10-2

Meeting Site:
Fountain Inn Presbyterian Church
307 North Main Street
Fountain Inn, SC 29644
Third Friday of the Month at 7:00 p.m.

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Greer, South Carolina 29650-2704

Newsletter Editor:
Bruce Gathman -
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Articles can be submitted anytime.

Transportation Technology Center

Transportation Technology Center, Inc. (TTCI) provides research, development, testing, system engineering, inspections, consulting, technical support, training to enhance safety, reliability, and efficiency for the railway industry. Its customers include freight and passenger railroads, suppliers, and government agencies throughout North America and worldwide.

Components for Optimising Rail Vehicles

TTCI's expertise covers freight and passenger rolling stock, vehicle and track components, communication and train control, and automated inspection systems.

The company uses 48 miles of test tracks for track structure and vehicle performance testing, life-cycle prediction and component reliability, lading damage prevention tests, freight ride quality, and passenger comfort evaluations.

Test Tracks at TTC

TTCI serves member railroads through the Association of American Railroads' (AAR) Strategic Research Initiatives program, focusing on railroad safety and reliability. TTCI also develops new technology for railways, suppliers, governments and other rail transportation entities.

TTCI Transportation Technology Center, Inc.

With up to 60 ton axle loads, the rolling contact fatigue simulator can generate a complete revenue service wheel and rail force environment that provides all possible wheelset tracking and table positioning capacities.

TTCI has a complete positive train control (PTC) test bed. Also a complete ITC (I-ETMS) and advanced civil speed enforcement systems (ACSES) make for more efficient, effective and safer PTC testing.

TTCI provides spectrum needs assessments and radio frequency (RF) network design; evaluates radio effects on system performance; helps plan and conduct effective tests; and assists with PTC migration.

In addition to freight rail projects, TTCI provides consulting services to the passenger industry. The company is proud to collaborate with a host of transit agencies.

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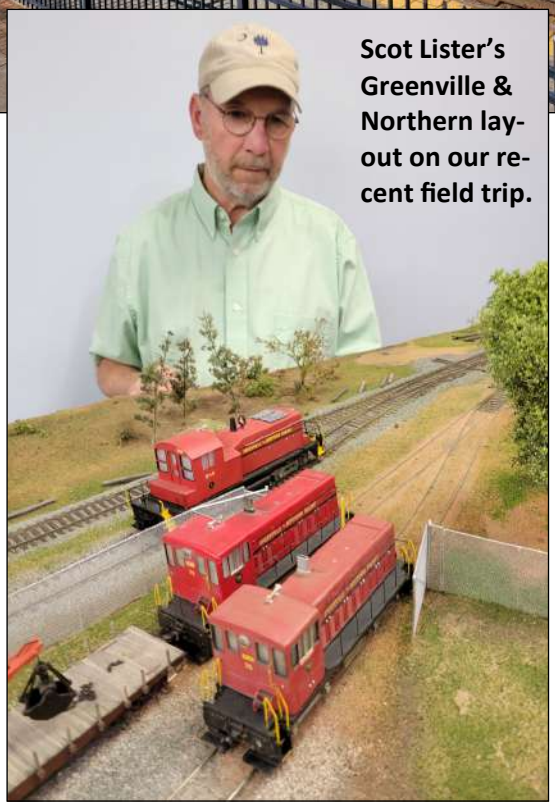
Museum Happenings

Florida commuter car passed by the museum on its way home.

↑ Some of the student learning how to use a dial phone.

School group posing for class photo. ↓



Scot Lister's Greenville & Northern lay-out on our recent field trip.

← The T-shirt quilt donated for a fund raiser. It was made from many railroad oriented t-shirts donated by our members.

Wanted—Articles for the Carolina Conductor

Submit an article of 200 words or more with some photos and captions and see them in print. Every one of us has some unique railroad experience that would make interesting reading for our membership. Your editor always needs more contributions of railway history and news.

other rail transportation entities.

TTCI also operates the Security & Emergency Response Training Center (SERTC), the world's foremost training facility for surface transportation-related threats and incidents involving hazardous materials. Along with classroom training, SERTC offers full-scale derailments and rail/highway vehicle scenarios.

Rolling Contact Fatigue Simulator

TTCI recognises that rolling contact fatigue (RCF) has remained a major challenge to freight railroads as it can play a key role in some derailments, and results in more than $800m in annual maintenance costs to the North American freight system.

The company aims to mitigate the consequences of RCF and wear with a state-of-the-art machine known as the rolling contact fatigue simulator (RCFS). This unique hydraulic test machine allows cameras and laser profile measurement systems to closely monitor initiation and growth rate of RCF and complex wear mechanisms due to a cyclic rolling load.

TTCI emergency response training.

Phased Array Ultrasonic Testing Technology for Inspecting Rails

TTCI's technology has proven its capabilities for detecting and characterising critical rail defect types, such as transverse defects under shells, in welds, and deep in the rail web, which are often difficult to find using conventional ultrasonic techniques.

Phased array ultrasonic inspection overcomes the limitations of conventional ultrasonic inspection, which leaves some flaws undetected during periodic inspection.

Supporting the Industry Shift to Positive Train Control Systems

TTCI Fatigue monitor.

TTCI continues to focus on solving critical issues associated with positive train control (PTC) deployment, as well as introducing supporting technologies.

The company helps clients to determine PTC system requirements; develop complete, unambiguous specifications; and select and configure systems to optimise benefits.

It can also help coordinate and process radio frequency applications for licences issued in US railroad bands, as well as serve as a host for railroad voice and data communications testing.

TTCI rail testing.

The company can also provide spectrum needs assessment and radio frequency (RF) network design; evaluate radio effects on system performance; help clients plan and conduct effective tests; and assist clients in migrating to PTC, without disrupting operations.

Web Based Training for Railway Employees

TTCI's railroad expertise and web-based training courses effectively meet the needs of a wide audience. Clients can save money on travel expenses and use the company's digital delivery to provide vital, on-demand

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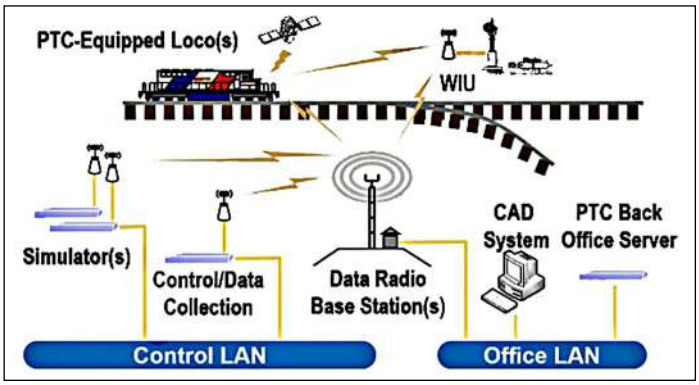
education and training to employees.

Current training courses in hazmat response include



grounding and bonding, foam applications, and tank car overviews and updates.

Consulting Services for Passenger Railways

In addition to work on freight rail, TTCI provides consulting services to the passenger rail industry. The company worked with the San Francisco Bay Area Rapid Transit (BART) District to investigate ways of waterproofing the Transbay Tube as part of an ongoing, system-wide earthquake safety initiative.

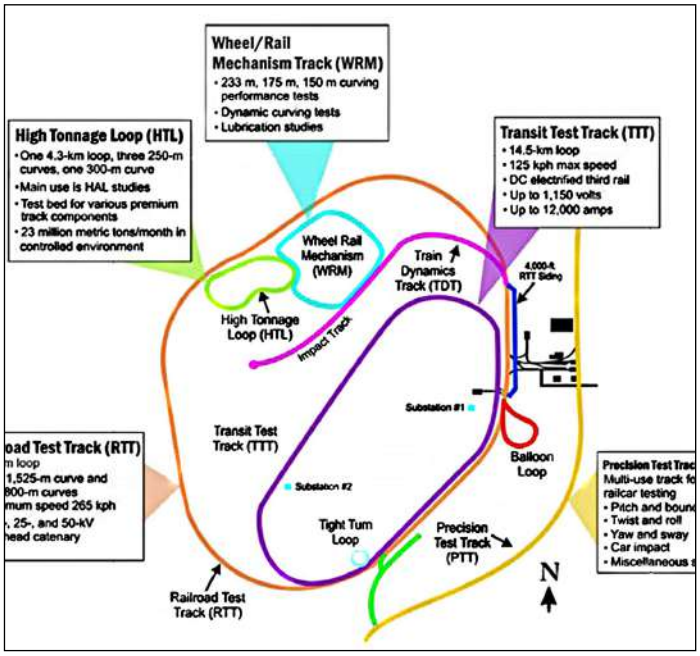
TTCI also helped Metro North Railroad (MNR) improve its overall infrastructure maintenance programmes, and was partnered with Ove ARUP to develop finite element blast models for passenger cars.

Test Tracks and Loops for Railway Cars

The company's specialised test tracks and loops can be used by freight suppliers for Association of American Railroads (AAR) M-976 certification and other testing.

Its railcar test expertise has attracted Chinese companies, such as CRRC Qiqihar Railway Rolling Stock

TTCI passenger testing.



(QRRS) and CRRC Yangtze Co. (CYR), to test and improve their newly developed freight railcar trucks.

TTCI has also worked with the Shuohuang Railway and the China Academy of Railway Sciences in a high profile project to increase axle load from 25t to 30t.

Detection System for Defective Wheel Roller Bearings

The company helps customers worldwide to manage and mitigate the risks posed by defective wheel roller bearings. In the UK and Germany, its Trackside Acoustic Detection System (TADS®) provides low false picks, while minimising the missed defects in high -speed trains.

In China, more than 90 TADS® systems have been installed to detect defective bearings in mixed freight, passenger, and high speed rail service.

About Transportation Technology Center

TTCI is a wholly owned subsidiary of the AAR. The company's facility, combined with a dynamic concentration of noted rail industry experts, allows it to solve technical problems with full-scale testing and modelling services, as well as offer consulting for railroad operations, engineering economics and track/ infrastructure.

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ENSCO provides engineering, science, and technology products to government and private sector customers in the aerospace, national security, and surface transportation sectors. ENSCO's corporate headquarters are physically located in Ravensworth, Virginia, with a Springfield postal address.

Industry: Engineering, Research and Development, National Security, Transportation, Avionics, Aerospace

Founded: March 31, 1969; 54 years ago

Founder: Dr. Paul W. Broome

Headquarters: Ravensworth, Virginia

Services: engineering services, avionics and aerospace technology, transportation technology, meteorological analysis technology.

Products and Services

The company provides products and services in surface transportation, aerospace, and national security programs. These include: AI/Machine Learning, Cybersecurity, Systems Engineering & Integration, CBRNE Modeling and Simulation, Seismology, Meteorology, Research & Testing, Training, Human Machine Interface, Human Presence Detection, Independent Verification & Validation, Position Navigation and Timing (PNT), Machine Vision Track Imaging Systems, Track Geometry Data Analysis, Autonomous Vehicle & Track Monitoring Systems, Track Maintenance Planning, Railway Safety Research and Development, Management of the Transportation Technology Center.

In October 2022, ENSCO was given operational control of the Transportation Technology Center (TTC) in Pueblo, CO by the Federal Railroad Administration (FRA). Along with maintaining the facilities, ENSCO conducts and oversees research, testing, engineering, and training on the site. ENSCO was tasked with expanding the TTC's capabilities to include all of surface transportation, including trucking, pipeline, and hyperloop.

History

The company was established by Dr. Paul W. Broome in 1969.

In 1970, ENSCO won their first contract from the FRA to provide research and track inspection systems for maintenance and safety.

In 1976, ENSCO began conducting highway safety research into lighting, signs, barriers, and pavement, including operating a full-scale crash test facility for the Federal Highway Administration.

In 1982, Francesco A. Calabrese became president of the company.

In 1983, ENSCO opened offices in Owego, NY, focused on providing software services, including design, development, documentation, and testing for military and commercial standards.

In 1989, ENSCO began supporting the United States' Eastern Launch Range, providing independent evaluations of mission-critical software for successful launches and to protect life.

In 1992, NASA selected ENSCO to provide research on the impact of weather on ground operations, launch, and landing of space shuttles.

In 1992, ENSCO created a grading and inspection system that automated the inspection of everything from lumber and baggage to food and weapons.

Rolling Stock Inspection Technology.

Continued on Page 6 - *ENSCO*

In 1995, The American Railway Engineering Association approved ENSCO's Gage Restraint Measurement System as the only system that met standards for use of technology in railroad inspection.

In 1996, ENSCO began exploring techniques for tracking and location that did not rely on GPS receivers.

In 1996, ENSCO created a first-of-its-kind early warning system to protect against chemical, biological, radiological, and nuclear attacks.

In 1997, Broome retired as chief executive officer.

In 1998, ENSCO developed devices for improved manufacturing and flight control using customer and commercially available tools.

In 2005, the company was hired by United Airlines to generate weather forecasts.

Also in 2005, the company opened an office in Watervliet, New York.

In 2011, the company opened an office in Montreal, its first international operation, to service the avionics market.

In April 2011, the company acquired the IData and IGL 178 product lines from Quantum3D.

In April 2013, the company was awarded a contract by Bombardier to provide wheel sets and testing services in support of Bombardier's design and build of new railcars for the San Francisco Bay Area Rapid Transit District.

In October 2014, Boris Nejikovsky was named president of the company.

In July 2015, the company received a contract to build a track inspection vehicle for Roy Hill Infrastructure in Western Australia. The company also received a contract to equip two Canadian National Railway hi-rail vehicles with both a track geometry measurement system and a machine vision joint bar inspection system.

In August 2015, the company was awarded a contract by Genesee & Wyoming for a paperless track inspection device.

In January 2016, the company opened an office in Perth.

In March 2017, the company was awarded a $74 million contract by the United States Air Force to provide modeling software and engineering support.

In April 2017, the company was awarded a contract by the Federal Railroad Administration for the Automated Track Inspection Program.

In January 2018, Paul W. Broome, the founder of the company, died.

ENSCO Rail Flaw Detection technology.

In March 2021 ENSCO was awarded a US$571 million contract to manage the Transportation Technology Center (TTC) in Pueblo, Colorado; the transition from the former contractor, Transportation Technology Center, Inc., was completed in October 2022. The contract has a five-year base period and three five-year renewal options. ENSCO also announced the formation of the Center for Surface Transportation Testing and Academic Research (C-STTAR) consortium, including eight universities and academic research centers, to assist with research "across all modes of surface transportation" at TTC. Other members of the C-STTAR consortium include: Center for Urban Transportation Research (at University of South Florida, consortium lead), Colorado State University–Pueblo, University of Hawaii, Michigan State University, Michigan Tech, Mineta Transportation Institute (at San Jose State University), University of Nebraska, Oregon State University.

Iron Highway

CSX PREPARES ITS "IRON HIGHWAY" FOR A COMMERCIAL TEST

Mar 25, 1996

After years of development, CSX Intermodal is almost ready to test the Iron Highway project in commercial service.

This concept, involving new and different rail equipment, is "CSX's proposed solution to the general inability of railroad intermodal to be competitive in short-haul service," said Dan Murphy, a CSX Intermodal spokesman.

Testing is scheduled to begin in June and continue through the end of the year on routes between Detroit and Chicago on sister company CSX Transportation and between Montreal and Toronto on CP Rail System. After the testing evaluates the Iron Highway's commercial potential, CSX will decide whether to go ahead with a project on which it has already spent $20 million to $25 million over the past five years.

REACHING NEW MARKETS

The new date for revenue testing comes after more than a year of delay that included a re-evaluation of the project. Parent CSX Corp. took the lead in the review because the service involved the assets and efforts of two business units. Iron Highway is meant to reach new short-haul markets that were previously considered not economically viable for intermodal. Most railroaders have previously estimated that intermodal service can only compete effectively with over-the-road trucking on hauls of 700 miles or more.

The Iron Highway grew out of an Association of American Railroads effort in the early 1980s to develop something called the High Productivity Integral Train (HPIT). HPIT represented a challenge to the rail supply industry by its railroad customers. The target was a 50 percent reduction in the costs of operating intermodal trains. The railroads themselves would invest no money, but the AAR would provide evaluation and testing. HPIT, it was felt, would address problems of accommodating different size containers, of slack action between cars and the need for special loading and unloading facilities.

INTEGRAL PART

One feature of course - the integral part - was nonnegotiable, since the concept would be lost if HPIT components were mixed in with elements of conventional trains, according to general industry practice. During the three-year AAR program, which had its official end in 1987, an idea developed by New York Air Brake - called the iron highway attracted attention. New York Air Brake joined with CSX Intermodal to develop the project to the test phase. CSX bought out New York Air Brake's interest in 1994 and later contracted with MK Rail to construct units to be used in revenue tests. Any description of the prototype being evaluated carries certain cautions.

"This is a research and development effort," warns Tom Hoppin, a spokesman for CSX Corp. "It has gone through a number of changes and there may be more." A brochure prepared by CSX Intermodal depicts a conveyance that looks like a conventional intermodal train.

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But a closer look shows some differences. Instead of flat cars coupled together, the picture shows an almost continuous platform, about 1,200 feet long, between two locomotives.

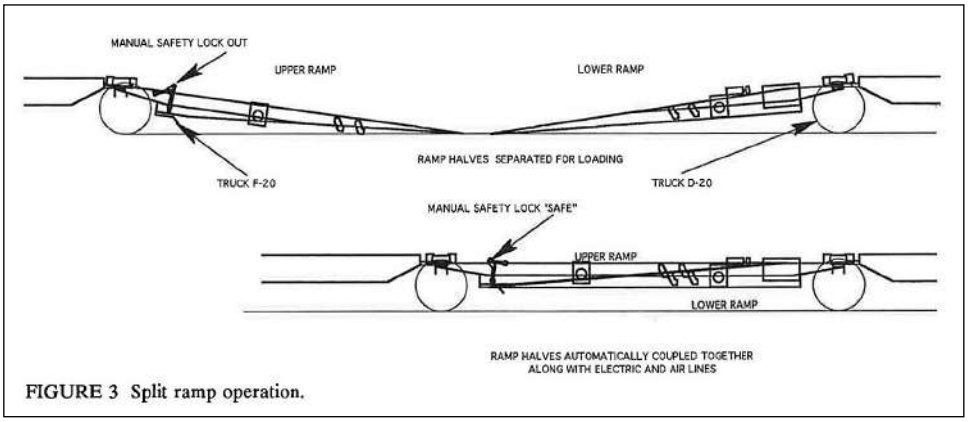

FIGURE 3 Split ramp operation.

UNIFYING CONCEPT

The pieces of the platform are joined by two-wheel sets placed between the gaps in the platform rather than the familiar four-wheel truck set. The arrangement allows trailers or containers of varying sizes to use up to 95 percent of the space between the two locomotives. At the center of the train, the platform can be pulled apart to form two ramps, allowing drayage trucks to push trailers directly on to the platform. This feature provides what Mr. Murphy calls the unifying concept that makes Iron Highway something other than just another intermodal train with skeletonized flatcars. It utilizes rapid loading and unloading without special facilities.

The train can accommodate up to 40 trailers as a single element or, said Mr. Murphy, "up to five elements can be linked together to create a 6,000-foot train." Mr. Hoppin said the research and development effort being expended on the Iron Highway concept indicates that CSX "firmly believes in the short-haul intermodal market" because of continuing concerns about the environment, highway congestion and other factors. "Some solution must be found," he said, "to today's truck-only option."