

## Continuing Education for the Railway Industry

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**Workforce development is a critical issue in the railway industry, particularly for small railroad companies and industrial (plant) railroads. The University of Tennessee Center for Transportation Research offers a series of instructor lead continuing education courses on railway topics. The 36 courses held since 2012 have produced over 18,400 contact hours of instruction. Attendee evaluations of the courses have been overwhelmingly positive.**

### Overview

Turnover in a rapidly aging workforce threatens to degrade relevant expertise in the railroad industry. New railroad hires often have little knowledge of proper practices, and the opportunity for learning by working alongside experienced workers is decreasing.

With their large employee population, Class I railroads can justify internal training programs for many needs. However, the smaller Class II and III railroads, public agencies, rail served industries, and transit railroads must generally look to external sources for workforce training and continuing education.

Recognizing these issues, a small number of U.S. universities and community colleges offer rail related continuing education. The University of Tennessee, Knoxville (UTK) is one such institution.

### Background

UTK first offered continuing education courses in railway topics during the late 1970s. Railway network rationalization threatened many branch and secondary main lines with abandonment, raising interest in short line railroads as a means of preserving service. UTK courses addressed topics such as evaluating rail service viability and operating small railroads. While successful, the program faded in the mid-1980s due to changes in management and faculty.

In 1992, seeing continuing education as a critical industry need, then-Administrator Gil Carmichael of the Federal Railroad Administration (FRA) and Elaine King, Rail Staff Officer at the Transportation Research Board, encouraged UTK to resume offering railway related workshops. Conditions were right, and the program has continued since that time.

### Recent History

Rail continuing education activity resides in UTK's Center for Transportation Research (CTR). Under NURail, CTR has broadened the program to add courses on rail infrastructure design and maintenance. This program content can incorporate results of NURail research and provide a technology transfer function. Current courses address track inspection (3 classes), bridge Inspection (2 classes), track design (1 class), and track maintenance (1 class).

Course topic selection is based on knowledge of rail industry needs, recommendations from industry advisors, and attendee post-class evaluations. Subject matter experts prepare original course content. Courses often include classroom and field exercises or site visits. Class duration ranges from 1 day to 4.5 days.

In general, courses are instructor lead in a classroom setting. Instructors are typically qualified university faculty members or retired subject matter experts. They present the course in a standard fashion following the prepared content package. Though content delivery is largely via the instructor(s), some courses include short topical lectures by invited speakers.

Course delivery by distance education is always considered, and facilities are available for this means of instruction. However, "hands-on" exercises are important to current classes, and distance education is ill-suited to this instructional methodology.



*Field track measurement exercise in Monterrey, Mexico*

CTR offers courses on both an open enrollment and closed enrollment basis. Closed enrollment courses are provided at cost at a designated location for sponsors. Open enrollment courses held at CTR selected sites charge a fixed tuition per attendee (UTK students are admitted without charge on a space-available basis). The closed enrollment model is financially attractive to sponsors having a number of employees attending a class.

All courses must cover costs; university and NURail funds are not used for course expenses. To date, no course has failed to meet this metric.

Small railroads or operating railroad museums provide a venue for certain classes requiring field exercises. Companies often view hosting a class as contributing to the industry. In return, CTR offers complementary course slots to the host. For example, the Tennessee Valley Railroad Museum (TVRM) in Chattanooga, Tennessee has hosted CTR classes for over 20 years. TVRM has a well outfitted room for instructional use, and also makes its railroad and facilities available.

Attendees complete a post-class evaluation form requesting feedback on venue, instructors, course content, and recommendations for future classes. They score various items using a 0-5 ranking. These are aggregated to an overall course score for each attendee, and responses are averaged across all attendees. To date, no course has had an average score below 4.7.



*Dr. Richard Bennett teaching bridge inspection in Knoxville, TN*

Since 2012, CTR has conducted 36 courses on railroad topics. These provided over 18,400 contact hours of instruction. Attendees represented railroads (Class I, Class II, Class III, tourist, industrial), public transportation agencies (federal, state, local), regulators (federal, state), consultants, suppliers, educators, and trade associations.

### Conclusions

UTK's continuing education activity offers an excellent opportunity to introduce results of NURail research to practitioners. For example, crosstie related projects at UIUC and UTK are highly relevant to the railroad track design, maintenance, and inspection courses.

Based on attendance at existing classes, supported by survey feedback, the continuing education program is serving a distinct need. CTR plans to expand the program in a deliberate fashion, and new classes are already under development. It is essential that research results be conveyed to practitioners, and this is a deliberate aim of CTR in supporting NURail.