




U.S. Department of Transportation
Federal Railroad Administration

A photograph of a high-speed train in motion, blurred to show speed, traveling along tracks that curve into the distance. The scene is set at sunset, with a warm orange and yellow glow on the left side of the frame. The background is a clear blue sky. The image is overlaid with several large, semi-transparent geometric shapes in shades of blue, yellow, and red.

**Section 22410 Operating Crew Member
Training, Qualification, and Certification
Summary of Audit Activities
2022-2023**

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INTRODUCTION

Section 22410 of the Infrastructure Investment and Jobs Act (IIJA)¹ requires the Federal Railroad Administration (FRA) to audit the training, qualification, and certification programs of locomotive engineers and conductors of railroads carriers subject to FRA’s locomotive engineer and conductor qualification and certification regulations (49 CFR Parts 240 and 242). The statute requires FRA to audit each Class I railroad at least once every five years and to audit a select number of Class II, Class III, and passenger railroads annually. The statute also requires FRA to publish an annual report on FRA’s website summarizing the findings of the prior year’s audits and any updates made pursuant to the audits. This report is FRA’s annual report for calendar years 2022 and 2023 specific to audit activities conducted pursuant to this mandate.²

SUMMARY

Upon the IIJA’s enactment, FRA developed an audit process to meet the IIJA audit requirements. FRA has documented the process in a set of guidelines used by FRA’s auditors.

FRA commenced the IIJA audit of NS’s conductor certification program on February 2, 2023, focusing on NS’s Conductor Trainee (CT)³ training program. The audit exposed CTs grappling to comprehend, internalize, and retain the critical safety information presented in training. CTs without previous railroad experience need adequate time and relevant exposure to the railroad environment to absorb its specialized language, procedures, and safety protocols. At the early stages of this IIJA audit, FRA sent a letter to NS on June 14, 2023, urgently identifying three grave deficiencies: First, FRA found the then-current 13-day conductor classroom training window to be markedly insufficient, failing to meet the complex demands of Class I freight railroad operations. Second, FRA determined NS’ OJT field training was deficient in structure, consistency, and oversight, leading to a heightened risk of trainees acquiring unsafe work practices. Third, FRA found NS had neglected FRA’s training regulations by designating “qualified instructors” without seeking concurrence or nonconcurrence from designated employee representatives. Each of these issues required NS to take immediate corrective measures outlined in the letter. Consequently, the FRA had temporarily suspended the IIJA audit to prioritize resolution of these critical issues.

NS has taken steps in response to the identified deficiencies. After cooperative engagements between FRA, NS, and representatives of the International Association of Sheet Metal, Air, Rail, and Transportation Workers – Transportation Division (SMART-TD), the labor organization that represents NS conductors, NS has instituted modifications to its training methodologies. NS has focused primarily on enhancing the on-the-job segment of training and has incorporated collaboration with SMART-TD into the selection of training facilitators. NS has also taken

¹ Pub. L. 117-58, 135 STAT. 740 (Nov. 15, 2021).

² FRA notes, though, that it conducted numerous compliance reviews of certification programs during the same timeframe pursuant to its general inspection authority, 49 U.S.C. § 20107. However, as those compliance review activities were not conducted pursuant to sec. 22410, they are not included in this report.

³ A Conductor Trainee, or “CT,” is an individual who has never been previously certified in the United States as a conductor pursuant to 49 CFR Part 242.

decisive steps to revamp the training approach at its McDonough Training Center by extending the training duration by an additional five days.

BACKGROUND

Congress enacted the IIJA in November 2021, requiring FRA to audit the training, qualification, and certification programs of locomotive engineers and conductors who work for railroads subject to 49 CFR Parts 240 and 242. Under Section 22410, FRA is to—

- 1) Consider whether such programs are in compliance with Parts 240 and 242.
- 2) Assess the type and content of training that such programs provide locomotive engineers and conductors, relevant to their respective roles, including training related to installed technology.
- 3) Determine whether such programs provide locomotive engineers and conductors the knowledge, skill, and ability to safely operate a locomotive or train, consistent with Parts 240 and 242.
- 4) Determine whether such programs reflect the current operating practices of the railroad.
- 5) Assess the current practice by which railroads utilize simulator training, or any other technologies used to train and qualify locomotive engineers and conductors by examining how such technologies are used.
- 6) Consider international experience and practice using similar technology, as appropriate, particularly before qualifying locomotive engineers on new or unfamiliar equipment or technology, new train control, diagnostics, or other on-board technology.
- 7) Assess the current practice for familiarizing locomotive engineers and conductors with new territory and using recurrency training to expose such personnel to normal and abnormal conditions.
- 8) Ensure that locomotive engineers and conductor training programs are considered separately, as appropriate, based on the unique requirements and regulations.

In 2021, FRA began developing an audit process to carry out Section 22410 of IIJA, which enhanced FRA's oversight authority by requiring the audited railroad carrier to take corrective action upon FRA's identification of a program deficiency, among other things. FRA has documented this process in a set of guidelines used by FRA's auditors.

FRA selected Norfolk Southern (NS) as the first railroad carrier to be audited under the IIJA audit requirement. FRA was familiar with the NS Part 242 program after having worked extensively during the prior years to improve the program.

Prior to, and since enactment of, IIJA, FRA's Operating Practices Division has regularly performed compliance reviews of railroads' locomotive engineer and conductor certification and qualification programs, which consider whether these programs comply with regulatory requirements of Parts 240 and 242, respectively.⁴ Under these regulations, FRA had reviewed

⁴Throughout 2022 and 2023, FRA continued its oversight of other railroads' compliance with Parts 240 and 242, including completing compliance reviews of two passenger railroad operations and various short line railroads. In the case of multiple short line railroads, FRA expended significant efforts working with these railroads to bring their

Footnote continued on next page.

and conducted a compliance assessment of NS's Part 242 conductor certification program, established on May 22, 2018. The review identified several deficiencies that did not meet the requirements of 49 CFR Part 242. Accordingly, on September 9, 2021, FRA issued a formal notification to NS detailing the multiple deficiencies. FRA identified NS implementing material amendments to its Part 242 program without prior FRA approval as a significant compliance issue, undermining federal oversight.

Additionally, FRA had evaluated the training component of NS's conductor certification program following several serious incidents occurring between March and October 2021. These included five accidents involving conductors or brakemen, which resulted in NS employee amputations and other severe injuries. Two of these incidents involved conductors with less than one year of service. On November 12, 2021, FRA issued a letter to the Association of American Railroads, the American Short Line and Regional Railroad Association, and the American Public Transportation Association, raising concerns about an industry-wide trend of shortening training programs for CTs with no prior certification experience. Following these incidents, FRA evaluated the training component of NS's conductor certification program and uncovered additional deficiencies.

As FRA completed the compliance review and upon NS correcting shortcomings of its program, FRA advised NS that it would conduct an audit of NS's Part 242 program under Section 22410 of IIJA. FRA commenced this audit on February 2, 2023. Findings from the audit are discussed below.

After about two years of working collaboratively with NS and SMART-TD, and following extensive revisions and oversight, FRA approved the revised conductor certification program on July 2, 2024.

FRA'S IIJA AUDIT OF THE NORFOLK SOUTHERN RAILWAY COMPANY

As indicated above, when FRA commenced this audit, FRA had significant concern about the training the railroads were affording to CTs, who are individuals who had never been previously certified as conductors. CTs without previous railroad experience need adequate time and relevant exposure to the railroad environment to absorb its specialized language, procedures, and safety protocols. Because of this, while the IIJA requires FRA to look at the training programs for both locomotive engineers and conductors, FRA has first focused its limited resources on addressing the immediate threat presented to CTs at NS.

NS has a bifurcated conductor training program. The first segment of training is centralized at the NS McDonough Training Center in McDonough, Georgia, encompassing theoretical classroom instruction and preliminary hands-on training. The second segment comprises on-the-job (OJT), implemented at the designated home terminal where a CT is assigned upon certification as a conductor.

certification plans into compliance with the minimum requirements of 49 CFR Parts 240 and 242. These efforts are continuing in parallel with FRA's IIJA audit program.

FRA’s audit spanned 10 months and included interviews with over 23 personnel, visits to three major terminals, and three weeks of observations at the McDonough Training Center. Those audit activities are summarized below.

Consider whether such programs are in compliance with Parts 240 and 242.

As discussed in this report, FRA has undertaken significant efforts with regard to the NS Part 242 program. As a result of this work, in collaboration with NS and SMART-TD, and following extensive revisions and oversight, FRA approved the revised conductor certification program on July 2, 2024. NS’s conductor certification program currently complies with Part 242.

Assess the type and content of training that such programs provide locomotive engineers and conductors, relevant to their respective roles, including training related to installed technology. Determine whether such programs provide locomotive engineers and conductors the knowledge, skill, and ability to safely operate a train, consistent with Parts 240 and 242.

The IJA audit identified three critical deficiencies in the NS conductor program’s training component, which by regulation are intended to equip CTs with the necessary knowledge, skills, and abilities to safely perform their duties:

1. The 13-day CT classroom training duration was markedly insufficient.

With respect to the training time at the McDonough Training Center, NS claimed the CT training was three weeks in total. However, FRA’s audit found the amount of time spent in training at the training center was only 13 days. This duration was too short to convey information necessary to meet the complex demands of Class I freight operations. NS remedied this by adding an additional five days of training and breaking up the training with OJT at the CT’s home terminal.

2. The OJT field training was deficient in structure, consistency, and oversight, leading to a heightened risk of trainees acquiring unsafe work practices.

FRA also found that NS’s OJT was deficient in structure, consistency, and oversight. In addition, NS was using conductors who had only recently been certified as a conductor (less than 1 year) to oversee CTs conducting OJT, asserting that these individuals had the “necessary operating experience” to do so.⁵ In response, NS restructured its OJT program to instill better structure, consistency, and oversight, and introduced “craft mentors” in collaboration with representatives from SMART-TD. The introduction of SMART-TD’s craft mentors into the OJT framework marked a significant step towards enhancing the OJT program. These mentors, with their extensive experience and knowledge, offer invaluable insights and hands-on training to the CTs. Their involvement ensures that the trainees are not only well-versed in standard procedures but are also prepared to address unexpected situations that may arise in the field.

⁵ 49 CFR § 242.119(e)(2). FRA does not specify what constitutes 'necessary operating experience.' Therefore, this matter may merit further analysis under the IJA "REVIEW OF REGULATIONS," which mandates a triennial review to determine whether any updates to parts 240 or 242 of Title 49, Code of Federal Regulations, are necessary.

3. NS had neglected FRA’s training regulations by designating “qualified instructors” without seeking concurrence or nonconcurrence from designated employee representatives.

FRA further found that NS had failed to comply with FRA’s certification regulations by unilaterally designating “qualified instructors” without obtaining the required concurrences from the designated employee representatives. The attempt to gain concurrence should be memorialized to demonstrate that NS complies with the requirements of 49 CFR § 242.7 (defining a “qualified instructor”). The requirement is intended to ensure that experienced instructors are selected, and the relevant employee labor organization is engaged in the selection of these field instructors who are not supervisors. In response, NS worked with SMART-TD to resolve this issue.

Determine whether such programs reflect the current operating practices of the railroad.

Before the commencement of the audit, in 2022, FRA conducted a System Audit of NS,⁶ prior to the February 3, 2023, derailment in East Palestine, Ohio,⁷ which included a review of NS’s compliance with 49 CFR § 217.9, Program of Operational Tests and Inspections; Recordkeeping.

Overall, FRA observed inconsistencies in NS’s operational testing and inspection program, ranging from access to and accuracy of records, to the methods and processes used to prioritize the testing of rules that prevent accidents. The failure to properly administer and implement the program of operational testing can diminish the capacity to correct accident/incident and injury trends. Further, recordkeeping systems should not allow testing officers to record numbers of tests that cannot be verified. The term “numbers” refers to individual rules monitored during testing activities. NS permitted officials to document any tests incorporated into a “scenario” whereby multiple rules are confirmed during a scenario test.

Consequently, the railroad could not verify the precise observations and tests carried out on its employees. Additionally, by allowing officials to document tests as “scenarios,” both FRA and the railroad were unable to verify the accuracy of the test results. This was due to NS’s policy mandate to formally train or discipline employees for all rule violations. The railroad conceded that testing officials were reluctant to report operational test failures, as this would necessitate formal training or disciplinary action. FRA concluded that without a properly administered program, NS could be hindered in monitoring conditions on the railroad or targeting resources successfully. FRA continues to monitor NS’s action plan to resolve the findings of the System Audit and will validate these improvements when the IJA audit is re-started.

⁶ FRA Audit Number: 2022-NS Special Audit-01-1 (available at <https://railroads.dot.gov/sites/fra.dot.gov/files/2022-11/Final%20Norfolk%20Southern%20Audit%20Report%202022%20%28003%29.pdf>). See also Norfolk Southern Safety Assessment (available at <https://railroads.dot.gov/elibrary/norfolk-southern-safety-assessment>).

⁷ <https://railroads.dot.gov/elibrary/accident-investigation-summary-report-hq-2023-1813>.

Assess the current practice by which railroads utilize simulator training, or any other technologies used to train and qualify locomotive engineers and conductors by examining how such technologies are used.

FRA has not yet assessed this with respect to NS.

Consider international experience and practice using similar technology, as appropriate, particularly before qualifying locomotive engineers on new or unfamiliar equipment or technology.

This was not considered as part of this audit, as FRA focused on the training of CTs.

Assess the current practice for familiarizing locomotive engineers and conductors with new territory and using recurrency training to expose such personnel to normal and abnormal conditions.

FRA assessed the territorial qualifications aspect of the OJT training component to a limited extent. FRA found the job aids⁸ provided to CTs were inadequate. The following paragraph provides one example:

If a conductor lacks territorial qualification on “other than main track” physical characteristics, they must be assisted by either a certified conductor who meets the territorial qualification requirements for such tracks or be provided with an appropriate, up-to-date job aid. FRA found that many of the available job aids were outdated, and the maps lacked a key, making them difficult to interpret, especially for CTs who could benefit from such information. Additionally, the track layouts and numbering were not consistent with the current configurations. Furthermore, the contact information provided, including phone numbers, did not correspond to the current Manager of Train Operations. These issues collectively hindered efficient operations and required attention to ensure accuracy and usability. However, NS is actively working with training coordinators to update and improve these job aids to enhance their accuracy and usability. FRA will validate the improvements when the audit is re-started.

Consider whether locomotive engineers and conductor training programs are considered separately, as appropriate, based on the unique requirements and regulations.

NS conducts training for its conductors separately from its locomotive engineers and makes revisions and refinements to its two programs separately. As stated above, FRA’s audited the conductor program, distinct from the engineer program.

⁸ Under § 242.7, job aid means information regarding other-than-main-track physical characteristics that supplements the operating instructions of the territory over which the locomotive or train movement will occur. A job aid may consist of training on the territory pursuant to § 242.119, maps, charts or visual aids of the territory, or a person or persons to contact who are qualified on the territory and who can describe the physical characteristics of the territory. At a minimum, a job aid must cover characteristics of a territory including: permanent close clearances, location of permanent derrails and switches, assigned radio frequencies in use and special instructions required for movement, if any, and railroad-identified unique operating conditions.

CONCLUSION

FRA's IJJA sec. 22410 audit of NS exposed shortcomings in the CT training program that NS needed to address with the utmost urgency, particularly considering the large influx of CTs that underwent training. FRA advised NS of the significant shortcomings and paused the audit to provide NS with an opportunity to make immediate corrections.

In response to FRA's audit, NS improved its CT training program.

As discussed above, FRA has undertaken significant efforts with regard to the NS Part 242 program. Throughout the process, FRA, NS, and SMART-TD worked collaboratively to revise NS's conductor certification program to meet the requirements of 49 CFR Part 242. After many months of work, FRA approved the program on July 2, 2024. NS's conductor certification program currently complies with Part 242.

FRA continues to monitor the CT training at NS as part of FRA's regular inspection activities and will validate these improvements upon the re-start of the IJJA audit.

FRA acknowledges the cooperation of NS and SMART-TD throughout the IJJA audit and their collaboration in making necessary improvements.