



Norfolk Southern

Safety Assessment



U.S. Department of Transportation
Federal Railroad Administration

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EXECUTIVE SUMMARY

Purpose

This report documents FRA's findings, recommendations, and methodologies resulting from the 60-Day Supplemental Safety Assessment of Norfolk Southern Railway (NS) that the Department of Transportation (Department or DOT) announced on March 7, 2023.¹ The Federal Railroad Administration (FRA) conducted this Supplemental Safety Assessment of NS (NS Safety Assessment or Assessment) between March 15 and May 15, 2023. The Assessment included a review of operational elements and an evaluation of NS' overall safety culture, with a focus on ensuring the railroad is appropriately engaging its employees and management on safety issues, in order to protect NS employees and the communities in which the railroad operates.

Methods

FRA conducted this Assessment in three parts: (1) an evaluation of NS responses to prior FRA safety recommendations; (2) focused inspections and investigations designed to evaluate safety-critical elements of NS' operations; and (3) a safety culture review including structured interviews (surveys) of NS employees and frontline supervisors and semi-structured interviews (fixed questions with open-ended responses) of NS leaders and local labor leaders who were also NS employees.

Prior to this NS Safety Assessment, in 2022, FRA conducted a systemwide safety audit of NS, which resulted in FRA making several safety recommendations to the railroad.² Similarly, throughout 2022 and 2023, FRA made several safety recommendations to the rail industry as a whole, through the issuance of a series of Safety Advisories. During this same time period, FRA also issued letters both to NS individually and the rail industry as a whole, to raise awareness of certain safety issues of particular concern to FRA. In this report, FRA reviews NS responses to those recommendations, discusses any NS actions discovered during FRA

¹ <https://www.transportation.gov/briefing-room/usdots-federal-railroad-administration-announces-supplemental-safety-assessment>.

² Federal Railroad Administration, Norfolk Southern Railway Company Audit Report, FRA Audit Number: 2022-NS Special Audit-01-1, July 8, 2022, [FRA Audit Report, Norfolk Southern Railway Company | FRA \(dot.gov\)](#).

follow-up, and examines the extent to which those responses and actions can provide any insight into the overall state of NS' safety culture maturity.

As part of this Assessment, FRA performed focused inspections and investigations to evaluate regulatory compliance, as well as assess how NS applies the 10 essential safety culture elements to the management and training of field employees. Focused inspections and investigations prioritized the following 11 operational elements:

- Track, signal, and rolling stock maintenance, inspection, and repair practices;
- Protection for employees working on rail infrastructure, locomotives, and rail cars;
- Communication between staff in the transportation, mechanical, and engineering departments;
- Operation control center procedures and dispatcher training relating to wayside detectors;
- Compliance with federal Hours of Service regulations;
- Evaluating results of operational testing of employees' execution and comprehension of all applicable operating rules and federal regulations;
- Training and qualification programs available to all railroad employees, including engineer and conductor training and certification;
- Maintenance, inspection, and calibration policies and procedures for wayside defect detectors;
- Procedures related to all wayside defect detector alerts;
- Measures implemented to prevent employee fatigue, including the development and implementation of fatigue management programs, required as part of FRA's Risk Reduction Program (RRP) rule; and
- Current status of the hazard and risk analysis required by the RRP rule.

As part of the focused inspection effort, where FRA found non-compliance with safety regulations, FRA is considering enforcement actions against NS, but the purpose of this Assessment is to explore aspects of the railroad organization and operations affecting safety in ways that are not necessarily addressed by rules and regulations. Government regulations, industry standards, and company policies each have an important role in creating a safe operating environment. However, even when taken together, these alone may not be sufficient to sustain safety in a dynamic environment. An organization's safety culture works to bind these elements together creating a robust and adaptive safety environment. As such, this Assessment covers a broader scope than would a regulatory inspection or a compliance audit.

FRA evaluated NS’ safety culture using the Fleming Safety Culture Maturity Model (FSCMM) as a guide. FRA gathered baseline information on 10 essential safety culture elements and using information from interviews, observations, recommendation follow-ups, and focused inspections, FRA used FSCMM to determine the relative maturity (advancement) of NS’ safety culture. Figure 1 illustrates the different maturity levels within the FSCMM.

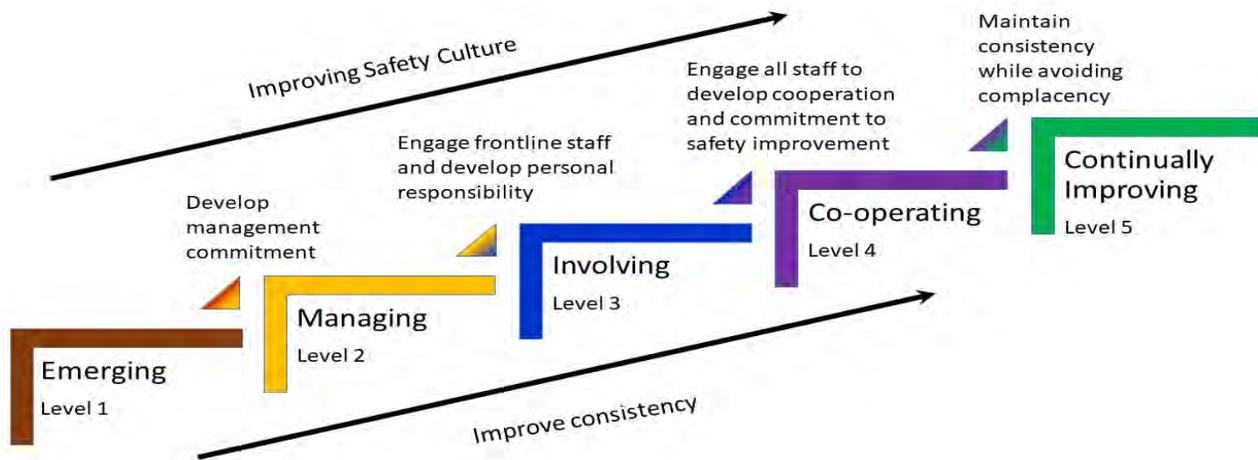


Figure 1. Fleming Safety Culture Maturity Model

The baseline information gathered through this Assessment provides a “snapshot” of the NS safety culture as it existed at the time of the assessment. This information is used to determine the maturity of each safety culture element at the time of the assessment and can also be used as a benchmark for future safety culture assessments.

Findings and Recommendations

As mentioned above, FRA evaluated 10 essential elements of NS’ safety culture, assessing NS’ safety culture maturity level. Results are shown in Table 1.

Safety Culture Element	NS Maturity level
Leadership is clearly committed to safety	Moving from managing to involving
The railroad practices continuous learning	Moving from emerging to managing
Decisions demonstrate safety is prioritized over competing demands	Managing
Reporting systems and accountability are clearly defined	Emerging
There is a safety conscious work environment	Moving from involving to cooperating
Employees feel personally responsible for safety	Involving
There is open and effective communication across the railroad	Moving from emerging to managing
Mutual trust is fostered between employees and the railroad	Emerging
The railroad is fair and consistent when responding to safety concerns	Emerging
Training and resources are available to support safety	Involving

Table 1. NS safety culture maturity level on each of 10 essential elements of safety culture

Based on its assessment of NS’ safety culture and operational safety, FRA found the overall safety culture maturity at NS to be in the *involving level*, although individual NS safety culture elements may be leading or lagging in maturity. This middle level of safety culture maturity reflects both the positive changes and renewed commitment shown by NS’ leadership to improve safety as well as the areas where NS continues to operate in a manner that is reactive and focused on compliance with minimum safety requirements of federal

regulations and industry standards. FRA identified four cross-cutting safety culture findings, which offer the greatest potential for improving safety outcomes, and is making associated recommendations:

Finding 1: NS communications are not always open and effective and require improvement.

FRA found, in a variety of contexts, that communication challenges exacerbated hurdles to achieving safety culture goals.

FRA recommends that NS:

1. Evaluate the communications processes surrounding responses to wayside detector alerts and alarms to identify and eliminate gaps and delays.
2. Develop a new (or refine existing) policy that outlines how information will flow throughout the organization.
3. Review NS' communication policy and update it, as appropriate.
4. Inform all levels of management, as well as employees, about the communication methods and protocols NS will use to disseminate information.
5. Clarify where specific information can be located and what (if any) information is available via more than one method.
6. If older communications systems (e.g., oral briefings, posted signage) are being phased out or eliminated in favor of electronic communications, ensure all employees are aware of this change and able to access the electronic systems.

Finding 2: NS employees and the organization do not always work to foster mutual trust.

Varying levels of trust within the organization are related, and in some cases attributable to, deficiencies in communication.

FRA recommends that NS:

1. Participate in the Confidential Close Call Reporting System (C³RS) to allow employees to anonymously report safety close calls without fear of discipline or enforcement.

2. Continue to explore ways to increase trust.
3. Review existing discipline programs and ensure their application is consistent across locations and managers.
4. Develop and implement a policy for responding promptly, and as publicly as possible, to safety complaints.
5. Engage with employees and solicit feedback on their perceptions of the current state of trust at NS and how that could be improved, and use that feedback to create action items designed to foster trust.
6. Include employees, and their representatives, in as many processes as possible including when required by regulation to consult with directly affected employees such as with 49 CFR Part 271: Risk Reduction Programs and Fatigue Risk Management Program.

Finding 3: NS Training and resources are not always effective at supporting safety efforts.

FRA recommends that NS:

1. Create additional opportunities for employees to complete both required “rules class” trainings, as well as supplemental safety training courses offered by NS during on duty hours. Consider taking concrete steps to set aside specific duty time for employees to participate in safety training opportunities.
2. Explore additional methods for evaluating the effectiveness of training, and develop and implement corrective actions in response to any findings.
3. Consider the methods that are used to administer training and explore the feasibility of offering more than one delivery method for trainings, to account for the differences in learning styles and preferences of adult learners. In the absence of alternatives to online training, utilize a variety of instructional methods, such as text, narration, video segments, interactive features, and the ability to apply what has been learned to engage with as many different types of learners as possible.
4. Review the training offered to frontline supervisors and make changes, as needed, to ensure that frontline supervisors are trained in leadership skills and understand how they are empowered to do their jobs. Ensure that frontline supervisor training is of sufficient length, quality, and content to enable supervisors to lead their teams effectively and safely.

Finding 4: NS frequently focused solely on enforcing compliance with minimum safety standards.

FRA recommends that NS:

1. Leverage partnerships with recently engaged safety culture consultants to review the findings and recommendations in this report. Identify the policies and actions that have led to the observed positive results and determine how these successes can be improved upon, and how this information can be leveraged in other areas of the NS safety culture.
2. Explore ways, including developing corrective actions for previous safety recommendations which may go beyond minimal regulatory standards, to move from systems that are reactive and focused on lagging safety indicators to those which are proactive and focus on leading safety indicators.
3. Consider FRA's findings when conducting hazard identification and risk analysis, as well as in the implementation of NS' Risk Reduction Program and Fatigue Risk Management Program.

FRA recognizes that NS has taken steps to be responsive to FRA recommendations and by implementing proactive safety measures. There are, however, areas where NS continues to use minimum standards set by regulations as a benchmark for efficacy. FRA encourages NS to work to advance its safety culture maturity by setting policies and procedures that incorporate proactive measures and continuous improvement goals.

FRA is committed to assisting NS in reaching its goals to improve safety for the benefit of its operations, employees, and the communities where it operates. As part of the FRA Safety Management Team weekly meeting with NS leadership, FRA will follow up with the recommendations made as part of this Assessment. Additionally, as part of these meetings, FRA will continue to track actions and defect resolution relating to the current issues of regulatory compliance, as well as outstanding recommendations from previous audits. FRA will continue to reiterate those recommendations that have previously been made to NS, where NS has indicated they go beyond regulatory requirements as FRA believes implementing these recommendations is important for improved safety outcomes. Lastly, FRA will continue to work with NS as a safety partner and seek out ways to work collaboratively to strengthen NS safety culture and improve overall railroad safety.

INTRODUCTION

Factual Background

On the evening of February 3, 2023, about 9:00pm (EST), an eastbound NS freight train derailed in East Palestine, Ohio.³ The train consisted of three locomotives (two head-end locomotives and one distributed power locomotive between railcars 109 and 110) and 149 railcars carrying general merchandise.⁴ Among the 149 railcars were 20 placarded hazardous materials tank cars.⁵ The incident resulted in 38 railcars derailing, including 11 of the hazardous materials tank cars.⁶ The derailment caused a massive fire and environmental damage to the East Palestine community, affecting air and water quality, and resulted in extensive property damage.⁷

Subsequently, on February 21, 2023, DOT Secretary Pete Buttigieg issued a Call-to-Action calling on industry and Congress to take immediate actions to improve rail safety in the U.S.⁸ The Secretary also reaffirmed the Department's commitment to using the full range of its authorities and resources to improve rail safety, noting that the Department would take several specific actions, including advancing certain key safety rules, initiating a focused inspection program on routes over which high-hazard flammable trains (HHFTs) and other trains carrying large volumes of hazardous materials travel; and initiating a focused inspection program of legacy tank cars that shippers and railroads have not yet upgraded.

³ National Transportation Safety Board, *Preliminary Report: Norfolk Southern Railway Train Derailment with Subsequent Hazardous Material release and Fires*, East Palestine, Ohio, February 3, 2023, [RRD23MR005 East Palestine OH Prelim.pdf \(ntsb.gov\)](#).

⁴ *Ibid.*

⁵ *Ibid.*

⁶ *Ibid.*

⁷ Environmental Protection Agency, *East Palestine, Ohio Train Derailment*, (June 9, 2023), [Daily Updates | US EPA](#). FRA and the National Transportation Safety Board's (NTSB) investigations into the East Palestine derailment are ongoing,

⁸ <https://www.transportation.gov/briefing-room/us-department-transportation-fact-sheet-steps-forward-freight-rail-industry-safety>.

On March 7, 2023, after a series of additional derailments and the death of one NS employee, DOT and FRA announced a plan for FRA to conduct the NS Safety Assessment.⁹ FRA conducted the NS Safety Assessment between March 15 and May 15, 2023, focusing on safety culture and training, along with focused inspections assessing compliance with selected regulations and NS' fulfillment of FRA's previous safety recommendations.

Within the past five years, NS has undergone significant organizational and operational changes. For example, in January 2021 the railroad's operational structure was reorganized and consolidated from nine divisions down to six divisions. As with other railroads, NS decisions in response to the COVID-19 pandemic also led to changes in the availability of personnel and less in-person training. Additionally, in recent years, NS has begun to operate increasingly longer trains. Figure 2 shows that from 2018 to 2022, NS' rate of accidents per million train miles rose, and did so faster than that of any other Class I railroad.

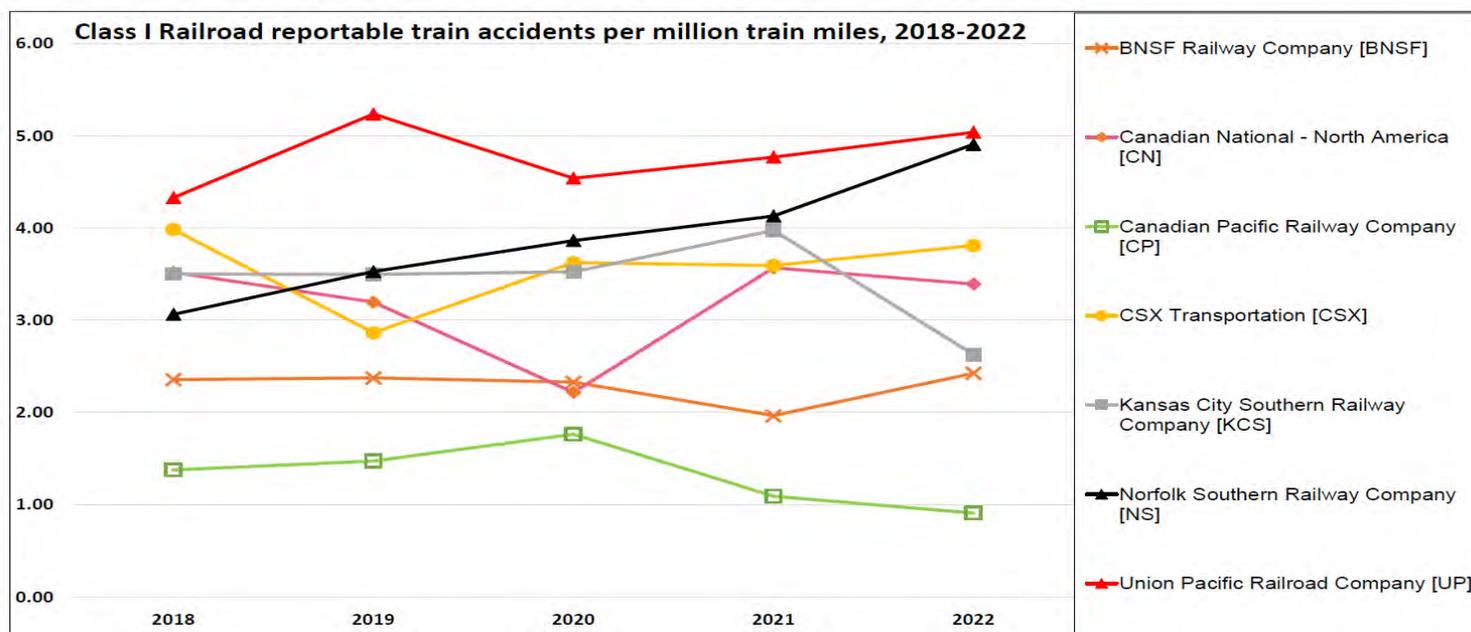


Figure 2: Class I Railroad Reportable Train Accidents Per Million Train Miles, 2018-2022

⁹ Press Release, U.S. Department of Transportation, USDOT's Federal Railroad Administration Announces a Supplemental Safety Assessment of Norfolk Southern Railway's Operations (March 7, 2023) [FRA 02-23.pdf \(dot.gov\)](#).

In 2023, FRA is currently investigating eight additional NS incidents, including one tragic fatality of a conductor trainee.

Safety Culture in General

DOT defines safety culture as the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands.¹⁰ FRA considers the 10 key elements of a strong safety culture to include:

1. Leadership is clearly committed to safety
2. The organization practices continuous learning
3. Decisions demonstrate that safety is prioritized over competing demands
4. The reporting systems and accountability are clearly defined
5. There is a safety conscious work environment
6. Employees feel personally responsible for safety
7. There is open and effective communication across the organization
8. Employees and the organization work to foster mutual trust
9. The organization responds to safety concerns fairly and consistently
10. Safety efforts are supported by training and resources

This NS Safety Assessment focuses on safety culture not only because FRA regulations require the Class I railroads and certain other railroads to promote and support a positive safety culture as part of their required Risk Reduction Programs,¹¹ but also because stronger performance on key safety culture indicators can lead to improved safety outcomes. FRA is using this NS Safety Assessment to measure and document the current state of NS' safety culture, and will compare the results with future safety culture assessments to determine whether NS is maturing in its safety culture. FRA will use this information to make recommendations to improve areas where safety culture is lagging, assess the efficacy of NS' Risk Reduction Program and

¹⁰ Federal Railroad Administration, *Safety Culture, a Significant Influence on Safety in Transportation*, [DOT/FRA/ORD-17/09](#).

¹¹ 49 C.F.R. Part 271.101 (a).

Fatigue Risk Management Program, and follow up with targeted inspection and enforcement efforts in those areas that are identified as posing safety concerns relevant to other FRA safety regulations.

Organization of the Report

Chapter 1 of this report discusses FRA's review of NS' responses to some of FRA's recent safety recommendations that stem from the system-wide special audit of NS, which FRA conducted from January through early May 2022 (2022 NS System Audit); safety advisories issued to the rail industry; and letters issued directly to NS, as well as letters FRA issued to the rail industry, addressing specific safety matters. Chapter 2 addresses FRA's evaluation of NS' critical operational elements, as they relate to the railroad's practices and compliance with federal regulations, as described in FRA's March 7, 2023, press release. These operational elements were evaluated by several divisions within FRA's Office of Railroad Safety, specifically, Operating Practices, Motive Power & Equipment, Signal & Train Control, Track & Structures, Audit Management, and Hazardous Materials divisions. FRA will discuss the specific operational elements related to each of the FRA divisions mentioned, and provide the findings identified during the 60-day assessment, along with recommendations for improvement. Chapter 3 covers the safety culture assessment portion of this NS Safety Assessment. In this section of the report, FRA will explain the definitions, data collection methods, and models used to evaluate NS' safety culture; provide a detailed analysis of the 10 elements of safety culture and identify NS' current level of safety culture maturity; and discuss findings and recommendations. Chapter 4 synthesizes the findings from the previous chapters and summarizes overall findings and recommendations. Specifically, it highlights the four main themes found throughout this NS Safety Assessment and makes recommendations regarding steps NS can take to make significant improvements.

Information collected through this Assessment went beyond the scope of FRA compliance audits, providing a more expansive look at NS' overall safety culture and operations. The information gathered will be used to target specific areas for FRA's oversight and enforcement efforts, and to help NS identify risks beyond the reach of current federal regulations.

CHAPTER 1: NS RESPONSES TO RECENT FRA ACTIONS

Section 1.1 2022 NS System Audit

In the second half of 2021, three Norfolk Southern employees suffered amputations while on duty. Two of these incidents involved conductors who had less than one year of service. This led FRA to begin an evaluation of NS' conductor certification training and qualification program and as a result of deficiencies noted in that program, on October 28, 2021, then-Acting FRA Administrator Amit Bose wrote to NS expressing FRA's concerns regarding the identified deficiencies. NS replied on November 8, 2021, noting that the railroad was reviewing and analyzing the incidents and stating that it would continue to monitor the effectiveness of its conductor training program and its compliance with the applicable federal regulations (49 CFR Part 242). Further, NS stated that it would work on addressing and responding to FRA's review of the program.

To assess the effectiveness of NS' overall safety systems, FRA conducted a system-wide special audit of NS from January through early May 2022. During this 2022 NS System Audit, FRA focused on seven critical aspects of NS' safety program:

- Critical Incident Stress Plans;
- Hazardous Materials;
- Motive Power & Equipment;
- Operating Practices;
- Safety Partnerships;
- Signal & Train Control; and
- Track Safety.

FRA inspectors from each relevant technical division conducted thorough inspections and investigations at strategic locations on NS' system and times.

FRA's audit showed that in many respects, NS' safety program was largely effective and compliant with relevant safety regulations. However, the audit also demonstrated that many opportunities existed for NS to improve employee and manager awareness of and compliance with FRA safety regulations and to improve

NS' safety culture.¹² The audit resulted in more than 20 findings and associated recommendations. FRA shared the draft audit report with NS prior to publication, and FRA considered NS' responses in making final report revisions. On February 1, 2023, NS sent a letter containing written responses to the FRA recommendations. Since the audit report was issued, FRA has continued to monitor NS' implementation of the recommendations. The audit report's findings and recommendations, NS' responses, and the current status of recommendation responses are listed in **Appendix A**.

FRA observes that NS has not promptly or comprehensively responded to FRA's recommendations and significant findings from the 2022 NS System Audit. Specifically, FRA observed inconsistencies in NS' 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 railroad's capacity to correct accident/incident and injury trends. Furthermore, the recordkeeping system should not allow testing officers to record tests that cannot be verified. Without a properly administered program, NS could be hindered in monitoring conditions on the railroad or targeting resources successfully. During this Assessment, FRA observed various actions to address the findings from the 2022 NS System Audit. But given the almost 12 months since FRA first discussed the 2022 NS System Audit findings with NS, it is clear that NS does not place an urgent priority on applying lessons learned from the audit and putting corrective actions in place.

Section 1.2 Safety Advisories (SA)

Between October 2022 and May 2023, FRA issued the following industry-wide SAs, containing recommendations to the entire rail industry designed to address specific safety issues:¹³

- Safety Advisory 2022-01: Use of Portable Derails;
- Safety Advisory 2022-02: Addressing Unintended Train Brake Release;

¹² The full report of the 2022 NS audit report can be found on the FRA eLibrary at the following link: [FRA Audit Report, Norfolk Southern Railway Company | FRA \(dot.gov\)](#).

¹³ *Ibid.*

- Safety Advisory 2023-01: Evaluation of Policies and Procedures Related to the Use and Maintenance of Hot Bearing Wayside Detectors;
- Safety Advisory 2023-02: Train Makeup and Operational Safety Concerns; and
- Safety Advisory 2023-03: Accident Mitigation and Train Length.¹⁴

NS provided FRA responses to the recommendations, and FRA continues to monitor the railroad's related activities. An itemized list of FRA's recommendations in these Safety Advisories, NS' responses, and current status of NS' responses is included in **Appendix B**.

Section 1.3 Correspondence with NS and with the Railroad Industry at Large, 2021-2023

Between October 2021 and June 2023, FRA sent numerous letters regarding important safety issues to the entire rail industry, as well as letters specifically addressed to NS. In many cases, formal responses were not required but encouraged; if NS provided a response, or if FRA is aware of the current status of NS actions in response to a letter, a summary of the response or current status is provided along with a copy of the letter in **Appendix C**.

Section 1.4 Chapter 1 Conclusions

FRA's report on the 2022 NS System Audit, published in July 2022, identifies 21 safety-related findings, and contains 25 recommendations for improvement across all disciplines. On February 1, 2023, NS responded, indicating that where recommendations exceeded the minimum regulatory requirements, they would take no further action, but did promise to engage in corrective action for the majority of the recommendations.

NS had notably prompt and positive responses to 2022 NS System Audit recommendations regarding deficiencies in some of its training programs.

¹⁴ Each of these SAs, including a supplement to SA 2023-01, may be found online in FRA's e-library at (<https://railroads.dot.gov/elibrary-search>).

In response to the 2022 NS System Audit recommendations about NS' Critical Incident Stress Plan (CISP), NS' initial response was negative, stating that the recommendations were beyond the scope of the regulatory requirements. Following continued discussions with FRA, however, NS has decided to take actions to respond positively to these recommendations. Specifically, NS will review training it offers to managers and frontline supervisors regarding the NS CISP including relief and assistance options available to employees after a critical incident. NS has also agreed to explore ways to address how critical incidents are documented and tracked.

In response to audit recommendations related to track safety, NS stated they would take no further action, because the recommendations were beyond the minimum regulatory requirements. FRA has not noted any subsequent change in NS' position and will continue to reiterate those recommendations as FRA believes implementing these recommendations is important for improved safety outcomes.

FRA is continuing to monitor to determine the effectiveness of NS' responses and corresponding actions to SA recommendations. In response to a recommendation to encourage employees to use best practices when building trains, however, NS' response centered on rules compliance rather than using the proactive practices recommended in SA-2023-02.

CHAPTER 2: CRITICAL OPERATIONAL ELEMENTS

Section 2.1 Critical Operational Elements Overview

FRA examined NS' compliance with the operational elements outlined in the FRA's press release on March 7, 2023.¹⁵ These operational elements were evaluated by several divisions within FRA's Office of Railroad Safety, between March 15 and May 15, 2023. The FRA divisions involved included: Operational Practices, Motive Power & Equipment, Signal & Train Control, Track & Structures, Audit Management, and the Hazardous Materials divisions. The following sections will discuss the specific operational elements FRA evaluated and FRA's findings on how NS performed during the Assessment.

Section 2.2 Operating Practices Findings

During the NS Safety Assessment, FRA's Operating Practices Division (OP) performed focused reviews and inspections relating to the following operational elements:

- Operation control center procedures and dispatcher training relating to wayside detectors;
- Evaluating results of operational testing of employees' execution and comprehension of all applicable operating rules and federal regulations; and
- Engineer and conductor training and certification.

Sub-Section 2.2.1 Operation Control Center Procedures and Dispatcher Training Relating to Wayside Detectors

During the week of March 13, 2023, FRA's Operating Practices team conducted a detailed assessment of wayside detection processes at the NS Network Operation Center in Atlanta, GA. The objectives were to evaluate regulatory compliance, identify inefficiencies, and recommend improvements. FRA's Signal &

¹⁵ Press Release, U.S. Department of Transportation, USDOT's Federal Railroad Administration Announces a Supplemental Safety Assessment of Norfolk Southern Railway's Operations (March 7, 2023) [FRA 02-23.pdf \(dot.gov\)](#).

Train Control team’s review of NS procedures involving wayside defect detectors is described in Sub-Sections 2.4.4 and 2.4.5 of this report.

The Advanced Train Control (ATC) Desk is a singular desk located within the Network Operations Center (NOC). The desk operates 24/7 and is continuously staffed by one mechanical employee (a former mechanical supervisor) working 12-hour shifts. The positions are supervisory and are not subject to the hours-of-service law. NS has a system of approximately 1,200 mechanical wayside detectors spread over its 19,500-mile network and staff at the ATC desk are responsible for monitoring wayside detection results, such as, looking for trending data and addressing alarms when they occur. This position is the primary point of contact for Train and Engine Service (T&E) crews who experience mechanical issues, as well as reporting when a wayside detector does not report. The ATC desk answers calls from crew and other wayside employees who may observe something, (e.g., smoke or sparks coming from an overheated journal on a passing train) from the field. Additionally, members of the public can also report sightings of all types of safety issues, including mechanical problems, by calling a designated number on Emergency Notification Signs (ENS) signs or through local authorities. These calls are typically directed to the chief dispatcher, who then contacts the ATC desk for assistance and historical information about the relevant train, once the details have been determined.

Finding 1: NS relies on emails from ATC desk to dispatchers, which slows communication.

Wayside “hot box” detector reports, referred to as “Hotbox reports,” are triggered in the event a wayside detector detects a heat anomaly (i.e., bearing, wheel, or axle that is exceeding safe temperature thresholds or trending toward exceeding the safe temperature). In such instances, the wayside detector transmits a signal to the ATC desk noting that the wayside detector either detected a critical alarm (temperature has exceeded the safety limit) or a trending alert (reporting an elevation in temperature). It should be noted that wayside detectors also broadcast to the train crew via the radio. Each wayside detector broadcasts location, direction of travel, and if there is a critical alarm (or no defect).¹⁶ FRA found the railroad’s process for handling, analyzing, and reacting to the data in the wayside detector reports by the ATC desk at the NOC demonstrated

¹⁶ Wayside detectors do not broadcast trending alerts (i.e., those identifying changes detected from one detector to the next to the crew), this information is only reported to the ATC desk.

a significant lack of standardization and consistency, directly contributing to data not being received by the personnel responsible for addressing the issues identified. Additionally, FRA noted that communication between the ATC desk and dispatchers was primarily via e-mail and as a result, FRA observed communication gaps, potentially allowing for delayed feedback and impeding issue resolution.

Recommendation:

NS should place indicators of detector locations on the dispatcher's board (i.e., tabs specifying the name, type, milepost, and possible health status of the detector), and should cease relying solely on email from the ATC desk for notifications, instead, implementing a more reliable communication channel.

Finding 2: NS' personnel policy poses a risk of delays or disruptions, if a single employee working the ATC desk takes a break or is addressing other issues.

During the Assessment, the OP team learned that NS' ATC desk personnel are eligible for remote work. With this personnel policy, only one employee, working remotely, was assigned to cover all detectors for the entire 19,500-mile network covered by the ATC desk. In addition to monitoring wayside detection results, the person working the ATC desk also has supervisory responsibilities, including being the point of contact for T&E crews experiencing mechanical issues. Besides the risk of delays or disruptions due to having only a single employee working the ATC desk, there is also the issue of lack of redundancy and coverage gaps during employee breaks.

Recommendation:

NS should reconsider the remote work option for ATC desk personnel, if only one remote employee is responsible for covering such a vast territory. NS should consider providing backup for the ATC desk employee responsible for covering all wayside detectors.

Since FRA's Assessment, as of July 10, 2023, NS has rescinded the remote work option for ATC desk personnel. Additionally, NS has added another employee to the ATC desk to lessen the burden of a single employee being responsible for monitoring the entire system, and to increase system reliability by providing redundancy.

Finding 3: NS' processes showed a lack of escalation for unanswered calls to the ATC desk from the dispatch floor.

When a critical alarm is received and after contacting the affected train crew, the ATC desk communicates with the dispatch center primarily via email. The ATC desk also conducts research of records and trending data and determines the steps to follow after a trending alert is received. During the Assessment, FRA witnessed dispatchers who were unfamiliar with detector locations and types, as well as lacking a standardized turnover process. Dispatchers were often the last to know when a train had been stopped, thereby causing potential delays in handling and protection.

Recommendation:

Due to the lack of escalation for unanswered calls, NS should prioritize the inclusion of dispatchers in the communication loop to ensure they are aware of each train's statuses. NS should also implement training and standardized procedures for dispatch turnover to ensure uniformity.

Finding 4: NS' Disaster Recovery Center Dispatcher Training Program should be evaluated for potential improvements.

A separate review of NS' Disaster Recovery Center Dispatcher Training Program was conducted in April 2023. At the time of review, the program consisted of seven weeks of classroom and scenario-based simulator training, followed by 16 to 23 weeks of on-the-job (OJT) and simulator assessments. Although sufficient in content and structure, FRA's review found areas needing improvement.

Recommendation:

NS should upgrade the dispatch system to permit simulator/scenario-based assessments on each territory, create a structured recurrency training program for qualified dispatchers, and establish territory-specific familiarization requirements.

Sub-Section 2.2.2 Evaluating results of operational testing of employees’ execution and comprehension of all applicable operating rules and federal regulations.

FRA’s 2022 NS System Audit included a review of NS’ compliance with 49 CFR § 217.9, Program of Operational Tests and Inspections; Recordkeeping. Overall, FRA observed inconsistencies in NS’ 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. The railroad 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 the FRA and the railroad were unable to verify the accuracy of the test results. This is due to NS’ mandate to formally train or discipline employees for all rule violations. The railroad conceded that testing officials were reluctant to report 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 has continued to work with NS to address the findings of the 2022 NS System Audit, including a review of NS’ most recent RP-1 Supervisor Guidelines for Conducting Efficiency Checks (Program) submission dated June 5, 2023. FRA’s review of the Program identified substantial compliance issues. Despite numerous opportunities to improve the Program, NS has not rectified the significant deficiencies identified in 2022.

The main deficiencies in the Program are as follows:

1. The Program fails to enforce the annual number of required tests and inspections for critical groups such as locomotive engineers, T&E, dispatch, engineering, and mechanical service employees, as mandated by § 217.9(c)(2).
2. The Program does not adequately detail each required operational test and inspection or the procedures for executing them. See 49 CFR § 217.9(c)(3). Specific shortcomings have been observed

in areas such as Handling Switches and Derails, Shoving or Pushing Movements, Securement of Equipment, and Blue Signal Tests.

3. The Program lacks established procedures for testing speed compliance and adherence to restrictive signal indications as required by § 217.9(c)(3). This gap could compromise the qualification and requalification of locomotive engineers under Part 240.
4. The Program does not specify the frequency of each operational test and inspection as required by § 217.9(c)(5).

Due to these persistent non-compliant conditions, on June 30, 2023¹⁷, FRA disapproved NS' Program. Per the applicable regulation, NS had until August 4, 2023, to correct these deficiencies and resubmit the Program for approval or provide a detailed written justification for the Program's current state. On August 4, NS requested an extension on their submittal until August 11, which FRA granted.

Sub-Section 2.2.3 Engineer and Conductor Training and Certification

On June 14, 2023, FRA sent a letter to NS demanding immediate modification of substantial deficiencies identified within its conductor certification program. For the last two years, FRA has highlighted concerns about NS' substandard responses.

FRA's OP Division has been performing an ongoing audit of NS, conducted under the Infrastructure Investment and Jobs Act (IIJA), Section 22410. This section pertains to the training, qualification, and certification of operating crew members, and requires the Secretary to commence audits of the training, qualification, and certification programs employed by railroad carriers for their locomotive engineers and conductors. So far, FRA's Section 22410 audit of NS has exposed shortcomings that NS must address with the utmost urgency, particularly considering the large influx of new hires currently undergoing training.

¹⁷ A copy of FRA's June 30, 2023 letter to NS is in Appendix C of this report.

In its June 14, 2023¹⁸ letter, FRA identified and communicated three specific areas for immediate and significant corrective action, as well as required NS to furnish a comprehensive action plan with a timeline for implementation within 90 days. On July 17, 2023, NS presented FRA with a progress update in response to FRA's direction. Listed below are FRA's findings and recommendations, along with NS' responses.

Finding 1: The current 13-day conductor classroom training window is markedly insufficient, failing to meet the complex demands of Class I freight railroad operations.

Recommendation:

NS should promptly reassess and significantly extend the duration of the program to ensure comprehensive knowledge acquisition, skill development, and practical experience.

NS Response:

NS collaborated with Atkins Nuclear Solutions (ANS) to review and enhance the effectiveness, content, and duration of the conductor training. Initial reviews have been completed and further conversations are in progress to implement ANS' recommendations by September 15, 2023.

Finding 2: NS' OJT field training is deficient in structure, consistency, and oversight, leading to a heightened risk of trainees acquiring unsafe work practices.

Recommendation:

NS should implement objective, measurable standards, record progress, and implement effective training and oversight mechanisms.

¹⁸ A copy of FRA's June 14, 2023 letter to NS is in Appendix C of this report

NS Response:

NS successfully distributed Qualification Books to current trainees and all personnel overseeing trainees. Along with the distribution, NS is implementing monitoring protocols and conducting regular physical reviews of trainees' progress. Further, an On-the-Job (OJT) Knowledge Assessment process has been implemented, and its effectiveness is under continual evaluation. NS is also creating a field orientation checklist, meeting with labor leaders to clarify conductors' roles and responsibilities, and developing a "train the trainer" session for these conductors.

Finding 3: NS has neglected FRA's training regulations by designating "qualified instructors" without seeking concurrence or nonconcurrence from designated employee representatives.

Recommendation:

NS must strictly adhere to the process outlined in 49 CFR § 242.7 for the selection of qualified instructors, ensuring joint selection, or memorialize if nonconcurrence with designated employee representatives occurred.

NS Response:

NS is setting up a bilateral training feedback system for each trainee-conductor pairing, a paper-based version of which will be implemented by August 3, 2023. In tandem, a digital version of the system is under development. Meetings with labor leaders have been held to discuss the expectations and characteristics of an effective trainer. NS is also updating its internal guidelines on conductor and trainee pairing based on these actions, with the project slated to continue through September 15, 2023, and potentially beyond.

FRA is actively monitoring NS' progress and will employ stringent enforcement measures should NS fail to address these concerns satisfactorily. IIA Section 22410 requires FRA to notify Congress of a railroad or any employee representative's refusal to cooperate with the audit and audit findings.

Section 2.3 Motive Power and Equipment Findings

FRA's Motive Power & Equipment Division (MP&E) specifically looked at the following operational elements:

- Communication between staff in the transportation, mechanical, and engineering departments, and
- Rolling stock maintenance, inspection, and repair practices.

FRA's assessment of NS' mechanical department included both regulatory (compliance with FRA regulations) and non-regulatory (issues not covered under FRA regulations, but still pose a risk) inspections and reviews. The Assessment, which covered all NS locations and included conversations with labor and management employees, is supported by the findings identified and documented during the 2022 NS System Audit and FRA's routine compliance inspections. FRA's MP&E Division's objectives during this Assessment were to observe improvements and follow up on corrective actions from the 2022 NS System Audit, specifically regarding brake tests, daily inspections, mechanical inspections, and blue flag protection of mechanical employees and crews designated to inspect freight cars and locomotives. MP&E also reviewed the communication procedures between NS transportation and mechanical employees, as it applies to protection of the employees with the movement of trains in and out of shops and yards inspection points.

While FRA is considering enforcement actions against NS based on the Assessment, FRA did not find egregious violations or incidents that indicated an individual liability or violation was warranted. FRA did not find instances of Blue Signal Protection miscommunication between NS' transportation and mechanical departments. Nor did FRA see instances of the transportation department over-riding the recommendations of mechanical inspectors for removing FRA defective cars from the line of road.

Although FRA did not identify a significant number of defects during this Assessment, NS' level of compliance did not meet the expectations generated by the employees (management and labor), who indicated that significant quality improvements were instituted after the 2022 NS System Audit. For example, during several meetings between the FRA and NS, NS claimed it had made improvements in its mechanical processes, including inspections. FRA's Assessment results indicate that NS has maintained the same level of performance that it had previously. While NS' mechanical department leadership has specific performance goals and quality programs in place, based on FRA observations, compliance has not improved. Therefore, FRA's MP&E Division will continue the focused inspections on all NS properties for an extended period.

Section 2.4 Signal and Train Control Findings

During the NS Safety Assessment, FRA's Signal, Train Control and Crossings Division (S&TC) performed focused reviews and inspections relating to the following operational elements:

- Signal maintenance, inspection, and repair practices;
- Signal training;
- Compliance with federal Hours-of-Service regulations;
- Maintenance, inspection, and calibration policies and procedures for wayside defect detectors; and
- Procedures related to all wayside defect detector alerts.

The S&TC Division also followed-up on the 2022 NS System Audit findings to confirm that the recommendations were addressed.

Sub-Section 2.4.1 Signal Maintenance, Inspection, and Repair Practices

FRA performed field inspections from March 15 through May 15, 2023, encompassing portions of the entire NS system. The field inspections focused on compliance with 49 CFR Parts 234 - Grade Crossing Safety, and 236 - Rules, Standards, and Instructions – Signal & Train Control. The inspections identified over 100 defects across 95 miles of NS territory and FRA is considering enforcement actions based on those defects. Further, reviewing the maintenance and inspection history of the territory identified a failure to prioritize critical safety work necessary to ensure safe operation. Overall, the areas inspected had a high number of defective conditions and a lack of general maintenance.

Finding 1: Frontline supervisors lack general signal knowledge and consistency when applying testing and maintenance procedures.

During the inspections, FRA observed frontline supervisors lacked general signal knowledge, and identified inconsistent application of railroad testing and maintenance procedures. FRA did note a strong understanding and dedication to procedures by mid-level and upper managers. The frontline supervisors, however, perform the direct oversight of the systems the signal department manages and the employees who maintain these systems. Therefore, they need to be better trained to ensure a technical understanding of these systems.

Specifically, frontline supervisors need to understand the company procedures for installing and maintaining these systems, as well as the federal regulations governing these systems. FRA found a high turnover rate and a lack of consistent training among frontline supervisors.

Recommendation:

NS should re-evaluate the training process for frontline supervisors. The training should ensure the supervisors are knowledgeable about the systems the signal department is responsible for maintaining, and about NS policies and procedures and applicable federal regulations for installing, testing, and maintaining these systems.

Finding 2: NS has signal maintainer territories that are often vacant.

FRA also found a number of vacant signal maintainer territories. There are a variety of reasons for territories being vacant. Bargaining agreements are in place to allow signal maintainers the ability to bid for positions. Some territories are filled quickly. However, some are open for extended periods, or they have high turnover rates. These bargaining agreements also allow the railroad to force employees to temporarily cover these vacant territories until they can be filled permanently. When positions are temporarily filled, it is with personnel who already have a regular position and who are often overwhelmed by the amount of additional testing and maintenance responsibilities of the extra territory. This could lead to a lack of general housekeeping and maintenance. Regardless of the territory being permanently or temporarily filled, the railroad shall ensure that all testing required by federal regulations is completed and the territories are properly maintained.

Recommendation:

NS should develop a list of signal maintainer territories proven to be hard to fill and develop a plan to fill these positions permanently. The plan should look for alternative hiring practices to ensure a diverse pool of candidates hired from these locations. This should ensure an adequate pool of candidates desiring to live in the difficult to fill territories. Until a long-term solution can be achieved, NS needs to develop an immediate process to ensure these territories are properly maintained and kept in compliance with federal regulations.

Sub-Section 2.4.2 Signal Training

S&TC worked with FRA's Safety Partnership Division to evaluate NS' compliance with 49 CFR Part 243, particularly NS signal training. NS has a comprehensive training curriculum for its signal employees. It consists of classroom training and OJT field training. NS has signal equipment set up outside its training center so that signal employees can work on and troubleshoot equipment without the consequences of being hooked to the track. This gives participants a real-life scenario in a classroom setting. FRA reviewed training and qualification records for signal. FRA did not identify any non-compliance with federal regulations and FRA note NS' state of the art signal training center.

Sub-Section 2.4.3 Compliance with Federal Hours of Service Regulations

FRA performed a review of Hours-of-Service (HOS) records for covered signal employees¹⁹ during the Assessment. During this review, FRA identified incomplete and missing HOS information. FRA identified 74 defects, and also recommended training for NS signal employees during their next HOS training class. FRA is considering enforcement actions based on these defects and FRA's S&TC Division will follow-up, within the next six months, on the HOS recordkeeping to ensure these deficiencies are corrected.

Sub-Section 2.4.4 Maintenance, Inspection, and Calibration Policies and Procedures for Wayside Defect Detectors

At the NS Training Center, FRA observed NS' training procedures for testing, installing, and maintaining wayside detectors. S&TC also observed NS' compliance with the railroad's own procedures for maintenance, installation, and testing of wayside detectors. Although the NS training procedures are comprehensive, FRA

¹⁹ The HOS law applies to employees engaged in "installing, repairing, or maintaining signal systems." Signal systems include the following: block signal systems, cab signal systems, train control systems, other related or similar systems (including wayside detectors), and highway-rail grade crossing active warning systems. See 49 U.S.C. §§ 21101(4) and 21104. An employee who performs any function that has the potential to affect the proper and safe operation of a signal system is subject to the HOS laws during the particular duty periods in which the function is performed, without regard to the class or craft of the employees or the manner in which the employees is compensated, if at all.

observed inconsistencies in signal employees' skills to perform testing, installation, and maintenance in some locations.

Sub-Section 2.4.5 Procedures Related to all Wayside Defect Detector Alerts

FRA observed NS' ATC desk from a signal and train control perspective, including observing personnel responses to wayside trending alerts, alarms, and malfunctions, as well as NS operating rules for defective equipment detectors. FRA's review of Operation Control Center procedures and dispatcher training relating to wayside detectors is in Sub-Section 2.2.1 of this report. Observations at the ATC desk showed NS has a good process for communicating detector malfunctions to its field forces. This allows the field forces to ensure the detectors are repaired in a timely manner.

Section 2.5 Track and Structures Findings

FRA's Track and Structures Division (Track) performed focused reviews and inspections relating to the following operational elements:

- Track maintenance, inspection, and repair practices;
- Communication between staff in the transportation, mechanical, and engineering (maintenance-of-way) departments; and
- Training and qualification programs available to all railroad employees.

The objectives of FRA's Track Division's assessment were to determine NS' compliance with track maintenance, inspection, and repair practices, as they apply to 49 CFR Parts 213 and 214. Additionally, FRA reviewed Roadway Worker Protection (RWP) for track employees. Finally, FRA assessed the communication between NS' transportation and engineering departments, to ensure they comply with FRA regulations and NS Operating Rules. Based on the coordinated federal and state inspections over 60 days, FRA is considering enforcement actions against NS. Following the 2022 NS System Audit, a notable improvement in track quality and compliance was seen at all inspection locations. This assessment showed much-improved Continuous Welded Rail (CWR) program compliance and engagement by the entire workforce. Training and education all the way to the ballast level was evident during inspection of work

gangs. The attention to detail by track employees indicated an involved workforce. That engagement was evident in the non-regulatory conversations related to positive safety culture as well.

There were no instances of RWP violations or situations where NS' transportation department did not follow the recommendations of the engineering department for the safest course of action.

While there is room for improvement, the Bridge and Track Infrastructure assessment shows a noticeable improvement. For example, FRA has had several productive meetings with NS to bring NS' CWR plan to compliance. The entire engineering labor/management team should continue with the goals and objectives they put forward after the 2022 System Audit.

Section 2.6 Audit Management Findings

FRA's Audit Management Division (AMD) looked at the following operational elements:

- Measures implemented to prevent employee fatigue, including the development and implementation of fatigue management programs, required as part of FRA's Risk Reduction Program (RRP) rule; and
- Current status of the hazard and risk analysis required by the RRP rule.

49 CFR Part 271 requires NS and all other Class I railroads to develop and implement a Risk Reduction Program (RRP) that includes, among other requirements, a systematic approach to identifying hazards, assessing risks associated with identified hazards, and development and implementation of corrective actions for those risks. To support their programs, railroads must submit for FRA approval a plan that, in part, describes the processes and schedule they will use to execute their RRP. FRA approved NS' RRP plan on May 6, 2022. Now, NS must fully implement the program described by its plan by May 6, 2025.

Fully implementing an RRP is a complex process, and NS identified a schedule for implementing various portions of its program, including training the employees who will be executing key program elements, and testing hazard identification and risk assessment processes, beginning in the fall of 2022. During this Assessment, FRA conducted on-site interviews to determine whether NS is adhering to its own implementation schedule. NS stated that it had identified hazards and would shortly use those hazards to test its risk assessment process, but it did not share supporting documentation. FRA continues to follow up with NS in weekly and quarterly calls to ensure it continues to meet its implementation timelines and deliverables.

On July 13, 2022, FRA published an amendment to Part 271 requiring covered railroads, including NS, to also develop a Fatigue Risk Management Program (FRMP) to use RRP processes to address the risks associated with employee fatigue. FRMP plans were due to FRA for review and approval by July 13, 2023. NS submitted its FRMP plan on July 7, 2023, and it is currently under review. FRA will work with NS and its directly affected employees, to ensure that any deficiencies in the FRMP are corrected prior to approval.

Section 2.7 Hazardous Materials Findings

FRA's Hazardous Materials Division (Hazmat) specifically looked at the following operational element:

- Protection for employees working on rail infrastructure, locomotives, and rail cars.

FRA's Hazmat Division participated in this Assessment by focusing on NS' compliance with the hazardous material regulations (HMR) of 49 CFR Part 174 – Carriage by Rail. A railroad's ability to transport hazardous materials safely, and the impact on its safe operations is, in part, contingent upon the actions of the hazardous materials shippers who offer these shipments for rail transportation. The rail carrier's transportation responsibilities for moving shipments are primarily limited to ensuring:

- Shipments appear ready for transportation at time of acceptance;
- Shipments are properly placed into a train;
- Accurate placement-in-train documents are maintained for a train;
- Shipments maintain a compliant condition while in transit; and
- Movement of hazardous material shipments is expedited to the destination.

While there are other carrier responsibilities related to the movement of hazardous materials (i.e., routing analysis, HHFT reporting, training, etc.), those responsibilities occur outside of the responsibilities of the train and yard personnel who assemble and transport trains with hazardous material shipments.

The HMR defects that were identified during the Assessment and have also been observed during FRA's routine compliance inspections, are typically technical in nature, do not contribute to accident causation, and do not indicate a systemic HMR compliance issue. Specifically, during the Assessment, Hazmat inspected approximately 100 train consists and identified defects related to maintaining accurate placement-in-train documents. In the event of a derailment, emergency responders would rely on the accuracy of these

documents to appropriately identify where hazardous materials were so they could safely work around the derailed equipment, and they could monitor the correct cars for changes that might indicate an impending fire or explosion. These defects were primarily the result of a numbering error by the conductor when adjusting the train consist after making pickups and deliveries. Typically, these numbering/counting errors result in the placement-in-train documents being off by one or two positions. In most cases, the conductor corrected the defect immediately. Due to this immediate corrective action, the inspector would record the defective condition but not make a violation recommendation.

Overall, during the 60-day Assessment, Hazmat conducted over 350 focused inspections, and is considering taking a few violations for non-compliance with the HMR against NS. The non-compliance was minor in nature and resulted from the actions of a few individuals across the NS network. However, findings such as documentation showing the location of placarded hazardous materials was not always correct could have a significant impact on decisions being made by first responders. First responders are taught train documentation is critical during an incident and they should be confident that documents supplied by the railroads are accurate.

Section 2.8 Chapter 2 Conclusions

FRA's 60-day NS Safety Assessment conducted by OP, MP&E, Signal, Track, Audit Management, and Hazardous Materials Divisions found varying results. There were some areas where NS has not shown much improvement since the 2022 NS System Audit, but in other areas there were noteworthy improvements.

FRA's OP Division identified seven findings during this Assessment. Those findings are: (1) NS relies on emails from the ATC desk to dispatchers, which could slow down vital communication, such as receiving wayside detector reports; (2) NS' personnel policy poses a risk of delays or disruptions, if a single employee working the ATC desk takes a break or is addressing another issue; (3) NS' processes showed a lack of escalation for unanswered calls to the ATC desk from the dispatch floor; (4) NS' Disaster Recovery Center dispatcher training program should be evaluated for potential improvements; (5) the current 13-day conductor classroom training window is not sufficient, and does not meet the demands of Class I railroad operations; (6) NS OJT field training is deficient in structure, consistency, and oversight; leading to heightened risks of NS trainees acquiring unsafe work practices; and (7) NS has neglected FRA's training

regulations by using the designation of “Qualified Instructors” without seeking concurrence from employee representatives.

FRA’s Signal Division identified two main findings that NS needs to prioritize to address critical safety issues. First, some frontline supervisors seem to lack general signal knowledge and the ability to consistently apply railroad testing and maintenance procedures. Second, NS has signal maintainer territories that are vacant. In addition to the two findings, there are some other areas that NS needs to address. There is an inconsistency in the skill levels of signal employees in testing, installing, and maintaining wayside detectors. FRA’s Signal Division also noticed that NS has an effective process for communicating to field employees when there are problems with wayside detectors. At the same time, as noted previously, ATC desk-dispatcher-crew communication regarding wayside hotbox detectors is deficient.

FRA’s MP&E Division did not identify any major issues during the Assessment. There were no egregious violations or individual liabilities since FRA’s 2022 System Audit, and there was no indication that NS’ transportation department was over-riding recommendations of its mechanical employees during this audit. However, FRA was disappointed that the claimed improvements in quality processes in equipment NS stated that it had made since the audit were not noticeable across all the NS shops. As a follow-up to the 2022 System Audit, MP&E returned in July 2023 for a specific mechanical system-wide assessment.

FRA’s Hazardous Materials Division inspected approximately 100 train consists during the Assessment and found some defects relating to the accuracy of train placement on train documents. FRA found these errors were likely due to numbering errors during pickups and deliveries. Nevertheless, these errors could have a significant impact on first responders. First responders are trained to rely on the accuracy of train documentation during incidents or accidents. If the placement of trains on train documents are incorrect, this could significantly impact a first responder’s ability to identify which trains are carrying hazardous materials.

FRA’s Audit Management Division conducted on-site interviews during the Assessment, to gauge whether or not NS was adhering to its own RRP implementation schedule. NS reported that it had already identified hazards and will begin to test those hazards against its risk assessment process. FRA approved NS’ RRP in May 2022, and NS must fully implement the plan by May 2025. After the Part 271 amendment to develop an FRMP, NS has developed and submitted its FRMP plan to FRA in July 2023. FRA is currently reviewing that plan.

The most significant improvements at NS since the 2022 NS System Audit were seen by FRA's Track Division. Track found notable improvements in NS' track compliance.

CHAPTER 3: SAFETY CULTURE ASSESSMENT

Section 3.1 Safety Culture Elements and Maturity Model

As noted above, the DOT defines safety culture as the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands.²⁰ The 10 key elements of a strong safety culture are condensed from several different safety culture models, all of which share these essential elements:

1. Leadership is clearly committed to safety
Leaders across all layers of an organization model safety-first attitudes and behaviors, and employees learn what the accepted practices are by following examples set by leaders.
2. The organization practices continuous learning
Opportunities to improve safety are continuously sought out and implemented. Organizations are open to learning from accidents when they do happen, and willing to make changes to prevent such incidents in the future.
3. Decisions demonstrate that safety is prioritized over competing demands
The organization uses decision making processes that demonstrate that safety is prioritized over competing demands. The organization will consistently choose safety over performance.
4. The reporting systems and accountability are clearly defined
Reporting systems and lines of accountability are in place so that safety issues can be promptly identified, fully evaluated, and corrected appropriately.
5. There is a safety conscious work environment
The organization exercises constant vigilance and an elevated awareness of the importance of safety. Employees are encouraged and provided opportunities to raise safety concerns using reporting systems and procedures.
6. Employees feel personally responsible for safety
Employees take more ownership in following safety procedures and are likely to speak up when they see other employees behaving in an unsafe manner.

²⁰ Federal Railroad Administration, *Safety Culture, a Significant Influence on Safety in Transportation*, [DOT/FRA/ORD-17/09](#).

7. There is open and effective communication across the organization
Employees feel comfortable communicating with their supervisors about safety issues and communicating with their peers when they see unsafe behaviors. The organization provides safety information in a way that is easy to find and understand.
8. Employees and the organization work to foster mutual trust
An environment of trust exists that facilitates open and honest communication about safety and minimizes fears of reprisal.
9. The organization responds to safety concerns fairly and consistently
The organization responds to safety concerns in a manner that is perceived by employees as fair, just, and consistent.
10. Safety efforts are supported by training and resources
The organization ensures that the personnel, procedures, and other resources needed to ensure safety are available, and that those who manage and operate the system have current knowledge that enables them to perform their jobs in the safest manner possible.

An organization's performance in each of these 10 elements is measured on a common scale; in the case of the NS Safety Assessment, FRA used a scale from 1 (strongly disagree) to 7 (strongly agree). FRA then used the information gathered on each of the 10 elements to develop a maturity model framework of NS safety culture, as described below. As noted above in Chapter 2 of this report, FRA also performed focused inspection efforts into compliance with selected regulations primarily associated with training and operational testing, as well as the status of recommendations from FRA's 2022 NS System Audit. Results of the focused inspection efforts that shed light on aspects of NS' safety culture are also discussed in this chapter.

Safety Culture Maturity Models are tools that help us describe and understand the level of development an organization's safety culture has reached. They use a set of defined criteria and processes to identify the characteristics of milestones associated with different developmental levels and can provide practical insight into steps that could be taken to improve the safety culture. These models can look at safety culture as a whole or examine the maturity of different aspects and elements of an organization's safety culture. There are numerous different maturity models. For the NS Safety Assessment, FRA used the Fleming Safety Culture

Maturity model (FSCMM)²¹ which identifies five levels of organizational safety culture: Emerging, Managing, Involving, Cooperating, and Continuously Improving. As an organization's safety culture becomes more robust and strong, practices that reinforce safety become more ingrained in the organization's operations, and safety culture moves from early levels to a goal state of a dynamic safety culture based on continuous improvement.

The lowest levels of safety culture maturity are focused primarily on minimal compliance with relevant statutes, regulations, and industry standards or reactive efforts to prevent accidents. The highest levels of safety culture maturity focus on continuous learning and improvement. As an organization moves up the ladder to higher maturity levels, the safety culture becomes more robust, and safety improves. At the same time, all levels of the organization become more consistent, and all employees increasingly work together to avoid complacency.

Section 3.2 Objectives, Scope, and Methodology

The objectives of the NS Safety Assessment were to (1) gather baseline railroad information for the 10 safety culture elements, including an assessment into compliance with relevant regulations as examples of safety culture performance, and (2) determine maturity/advancement of the railroad's safety culture using the FSCMM using information from interviews, observations, and focused inspections.

The baseline information provides a "snapshot" of the NS safety culture as it existed at the time of this Assessment. This information is used to determine the maturity of each safety culture element now and can also be used as a benchmark for future safety culture assessments.

To obtain the data needed to develop an initial benchmark of NS' current safety culture, FRA's Office of Safety Audit Management Division (AMD) developed safety culture assessment materials. FRA developed open-ended interview questions for FRA to address to NS leadership and labor leaders in a semi-structured interview format, and structured interview questions to ask in the field by Office of Railroad Safety personnel using surveys. FRA's Safety Management Team (SMT) personnel provided AMD personnel names and

²¹ Fleming, *Safety Culture Maturity Model*, 2001, pp. 4-6.

contact information for NS leadership, as well as several NS union officials throughout NS territories. AMD personnel conducted one-on-one interviews via telephone with identified NS leaders and union officials. FRA deployed inspectors and other FRA personnel to rail yards in every state in which NS operates and asked craft employees and frontline supervisors if they would volunteer to participate in a one-on-one survey interview. The inspectors were integral in visiting numerous yards and administering the surveys. FRA collected survey data in conjunction with other inspection activities, and therefore the interview locations were not chosen at random, creating a “convenience” sample reflecting interviews conducted at locations FRA visited for inspection purposes.

Several inspectors indicated that some NS employees in the field expressed initial hesitancy and apprehension regarding participation in the survey interviews. There were also instances when supervisors indicated they wanted to be present during the interviews of their direct reports or supervisors who requested to be informed if an employee had participated. The SMT staff also reported reluctance to participate on the part of some local union representatives, who are also NS employees. This hesitancy and apprehension were immediately reported to NS leadership, who indicated that they had and would continue to encourage their employees to participate in the data collection process and could do so without management presence. Much of this reluctance, as well as requests from supervisors, occurred during the first week of survey data collection. As data collection continued, many inspectors found little if any reluctance to participate and attributed any early reluctance to miscommunication about the purpose of the data collection effort. However, some NS employees continued to express concern of retaliation for the duration of the data collection period, and some outright refused to participate out of fear that management would be able to identify their responses and later take adverse, punitive action against the employee. This is an example of the limitations of the non-randomized sample: it cannot be known from the available data if this hesitancy was specific to a railroad craft, localized in a yard or geographic area, or if this is an issue system wide. FRA believes these observations are important to note, as the hesitancy or refusal to participate in itself can be an indication of overall safety culture. However, this finding is presented with the caveat regarding the sample and the acknowledgment that throughout data collection NS leadership was cooperative with FRA personnel and encouraged employees to participate in FRA’s data collection efforts.

For this report and all safety culture assessment reports going forward, FRA will not use any individually identifiable information. To ensure confidentiality and to protect anonymity, FRA will not report any names,

titles, union names and officials, or other information or combination of information that could identify any railroad employee, including railroad leadership.

As part of the NS Safety Assessment, FRA conducted structured close-ended interviews (survey interviews) with railroad craft employees and frontline supervisors and semi-structured interviews with NS leadership and labor representatives. FRA also visited the NS Training Center in McDonough, GA, and observed training sessions for newly hired employees across the various railroad crafts. In addition, FRA completed a series of focused regulatory compliance inspections across the NS system. FRA personnel completed a total of 435 survey interviews of various railroad craft employees and frontline supervisors across NS railroad division locations. **Appendix D** reflects aggregated demographic information of the employees who responded to the survey interviews including a breakdown of crafts surveyed, years of experience, and yard locations. A copy of the survey interview questions is in **Appendix E**.

FRA interviewed approximately 20 labor leaders and 10 members of the NS leadership team as part of the NS Safety Assessment. These were semi-structured interviews, and each individual was asked to respond to the same series of open-ended questions based on the 10 safety culture elements, as defined by the USDOT Secretary's Safety Council. A copy of the questions asked in the semi-structured interviews is in **Appendix F**.

Section 3.3 Findings: Current NS Safety Culture

FRA reviewed information from the semi-structured interviews, survey interviews, training center visits, and focused inspections to form an image of the NS safety culture environment as it exists today. Inferences and comparisons between groups are not reported here. This is to ensure that no responses can be traced back in any way that would make identifying the employee who provided the information possible. As previously stated, the survey data were collected in conjunction with other inspection activities. As such, the locations visited were not chosen at random. As inferential analysis cannot be used with "convenience" samples providing a global view of the safety culture of the NS system divided by craft and years of experience is more consistent with the available data. Instances where FRA believes specific information would be useful to NS have been provided under the "Anecdotal Findings" subheading. Information from anecdotal findings

is not included in the general findings nor are any recommendations made based on this anecdotal information.

Overall NS Safety Culture

Information collected as part of this safety culture assessment indicates that recent changes NS has deployed across its system have started to have positive impacts. However, communication about these changes is inconsistent, with some frontline employees and supervisors being well-versed in these new safety changes and improvements and others lacking any such awareness. No trends were observed in the data to indicate that these inconsistencies were specific to any yard or employee craft. Rather it seems employee and supervisor awareness (or lack thereof) may be a reflection of early phase implementation. Initiatives such as Comply365²² and the peer to peer “Making It Right” campaign are generally perceived positively by those who are aware of them. **Appendix G** contains additional information on NS safety initiatives.

One finding of note is the apparent disconnect between frontline supervisors and employees. Supervisors rated all aspects of safety culture at NS higher than did craft employees. The biggest disparity, according to the data collected, between supervisors and craft employees is with regard to whether corrective actions are implemented before taking disciplinary actions. Maintenance of way employees who provided comments indicated that coaching and corrective actions happen before disciplinary action is taken. However, the majority of other craft employees who provided comments on this issue cited that corrective actions or coaching happen after a disciplinary action has been taken.

At the NS Training Center in McDonough, GA, safety rules, such as not talking on the phone while walking, and wearing appropriate personal protective equipment (PPE), were followed by everyone observed at the training center. The center itself is a state-of-the-art facility with instructors who are subject matter experts in their craft. The center would be an ideal platform to introduce NS safety culture initiatives to employees from the start of their employment.

²² <https://comply365.com/norfolk-southern-partners-with-comply365-to-digitally-transform-operations/>

Although the ability and willingness of employees to report potential incidents and “near misses” without fear of punishment is most strongly associated with the 9th element of safety culture (the railroad is fair and consistent when responding to safety concerns), different aspects of this reporting structure can be associated with all 10 safety culture elements. Comments received from both labor and NS leadership as part of the semi-structured interviews were similar in their views of how NS addresses these close call incidents. Both groups indicated that NS has an electronic system to report these close calls, and both groups further indicated that some employees may be hesitant to use the online system out of concern that the report could be traced back to the employee. Likewise, both groups also discussed the “experience box” as a way for employees to write down concerns on paper and submit them anonymously. Those providing interviews indicated that there had been discussions of shifting from paper-based forms to all-electronic reporting, but that NS was evaluating more use of these experience boxes in response to employee preference. For the future, NS has committed to participating in the voluntary Confidential Close Call Reporting System (C³RS). Once the program is established on the NS system, employees can use the system to anonymously report near misses without fear of discipline or enforcement and the railroad industry can benefit from the analysis of trends and develop safety mitigations, as appropriate. **Appendix G** has additional information regarding the NS Close Call Experience Program.

The information gathered as part of the safety culture assessment indicates that NS is currently in the *involving level* of safety culture maturity. Some elements of the NS safety culture, including those clustered around communication and trust, are still in the *emerging level*. Developing a strong safety culture is a time intensive effort. Efforts focused on supervisor interactions with employees were observed to be at the higher end of the *emerging level* as indicated by engagement and cooperation around common safety goals. NS responses to FRA recommendations made as a result of the 2022 System Audit are illustrative of its safety culture maturity. Specifically, many initial responses to FRA recommendations indicated that NS would take no further action as NS believed those recommendations exceeded current regulatory requirements. This is consistent with *emerging level* safety culture maturity where the focus is on meeting minimal statutory and regulatory requirements. However, in the months since the 2022 NS System Audit, FRA and NS have continued to work together on these recommendations and other safety issues. As a result of the collaboration, NS has revised its response to several FRA recommendations and is now exploring ways to implement those recommendations across its system. However, there are still audit recommendations that NS has indicated go beyond regulatory requirements and will not be addressed further. FRA will continue to

reiterate those recommendations where NS has indicated they go beyond regulatory requirement as FRA believes implementing these recommendations is important for improved safety outcomes.

Safety Culture Elements

Results related to the 10 Safety Culture Elements are presented below. Supervisors and employees who participated in the survey interviews were asked to provide their responses on a scale of 1 to 7 where 1 was “strongly disagree”, 2 was “disagree”, 3 was “disagree slightly”, 4 was “neutral”, 5 was “slightly agree”, 6 was “agree”, and 7 was “strongly agree”, with an opportunity to provide ‘free form’ feedback relating to the question.

Figure 3 shows a summary of the survey results for each element, and clearly shows a consistent difference between the perceptions of employees and those of supervisors.

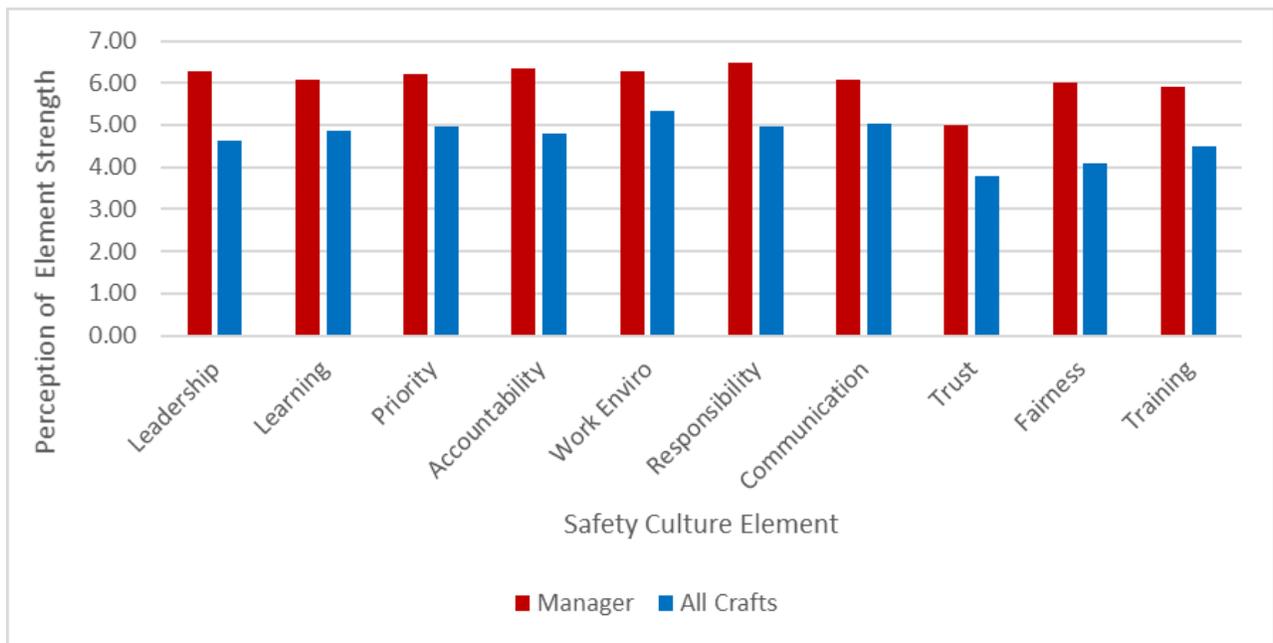


Figure 3: Differences in NS Safety Culture Perceptions Between Managers (frontline supervisors) and All Craft Employees

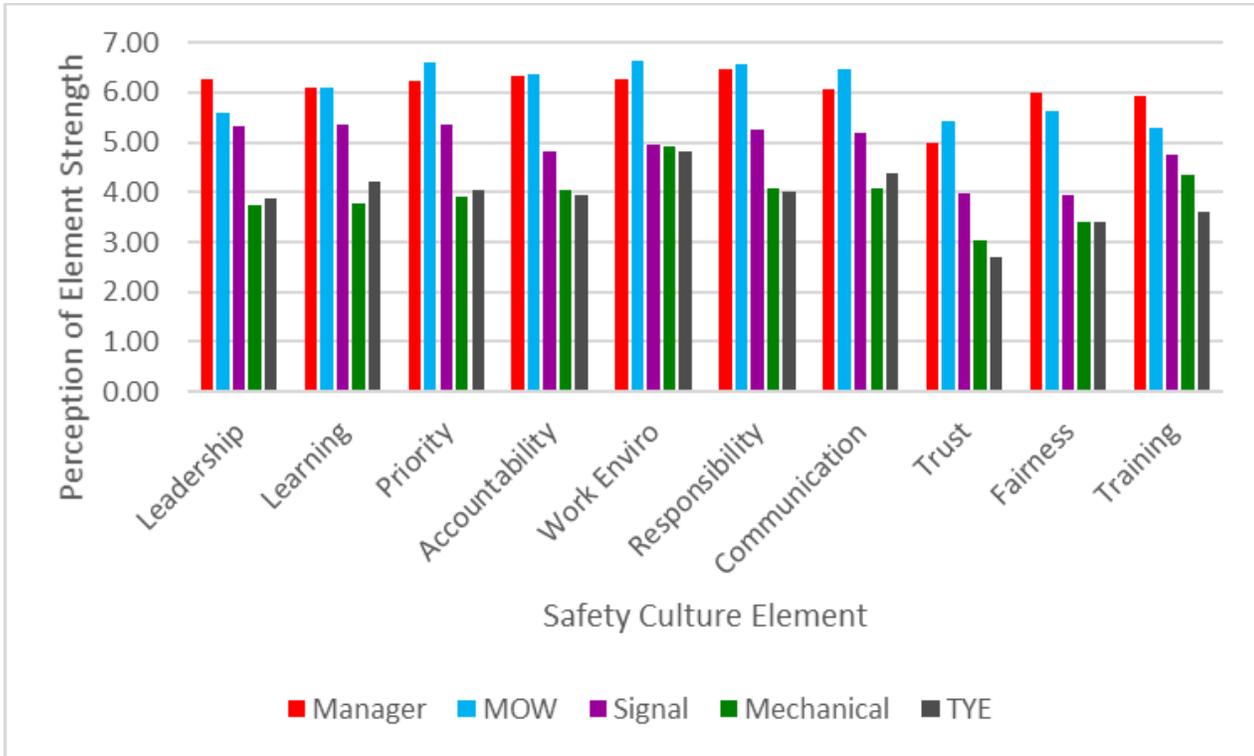


Figure 4: NS Safety Culture Perceptions by Employee Craft

Figure 4 summarizes survey results by craft of employee. Employees of the Train, Yard, and Engine and of Motive Power and Equipment crafts were most likely to report pessimistic perceptions whereas maintenance of way employees’ ratings were more optimistic.

In the subsequent sections, each safety culture element is discussed in terms of rating and general findings, as well as selected examples from FRA’s focused inspection assessments into selected regulatory compliance. For each finding the numerical value reported represents the average rating out of 7 for that element. Note that higher numbers indicate stronger agreement. All available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

Element 1: Leadership is Clearly Committed to Safety

An indicator of railroad leadership's commitment to safety is their response to safety issues that FRA identifies. For nearly two years, FRA has engaged with NS to bring NS' 49 CFR Part 242, Conductor Certification Program, into compliance. FRA first raised concerns regarding deficiencies in NS' conductor certification training program in October 2021 following several serious accidents and incidents, including five involving conductors/brakemen who suffered amputations and other serious injuries between March and October 2021. Two of those accidents involved conductors who had less than one year of service. As noted in Chapter 1, on June 14, 2023, FRA transmitted to NS a letter, re: Mandatory Immediate Action: Grave Deficiencies in Norfolk Southern's Conductor Certification Program, raising substantial issues requiring urgent, immediate attention, and directing NS to update its conductor certification training program in compliance with federal regulations.

Results from the survey interviews revealed an average response of 4.39 to questions related to perceptions of leadership's commitment to safety across all participating NS employees. Supervisors provided the highest rating (6.27) while mechanical employees had the lowest (3.74). Those employees with less than 1 year of experience provided the highest rating (5.81) and those with 21-30 years of experience had the lowest (3.58). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

Responses from throughout the railroad suggest that there is an apparent new commitment to safety from leadership. Results from over 25% of about 450 employees, both in comments during the survey interviews and during semi-structured interviews, indicate that there has been a perceived shift in management attitudes recently that has reprioritized safety. Some commenters observed this shift beginning with a change in NS leadership. Others observed this shift happening in response to concerns raised by FRA. Some reported observing this shift in response to the implementation of new safety programs.

The semi-structured interviews revealed that NS is shifting from a top-down approach to one that is more collaborative. NS leaders indicated new initiatives such as “Team of Teams”²³ and the internal FORGE social media network are based on trust, collaboration, and communication. These are key foundational elements to a strong safety culture. Some labor leaders indicated they were beginning to observe some of these changes. However, this new approach is in its early stages, which is reflected by comments from other labor leaders indicating that there is still a perception that communication from management is one-way and prescriptive. It should also be acknowledged that NS recently engaged an independent safety consultant, Atkins Nuclear Secured, to conduct a comprehensive review of the NS safety culture.

Comments such as “commitment varies based on manager” and “local managers are committed to safety, but middle managers are not” when compared with “management reiterates safety daily” and “safety has been brought back in to focus,” considered along with other available data, indicate this element is currently between the *managing* and *involving* levels of safety culture maturity, as Figure 5 shows. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

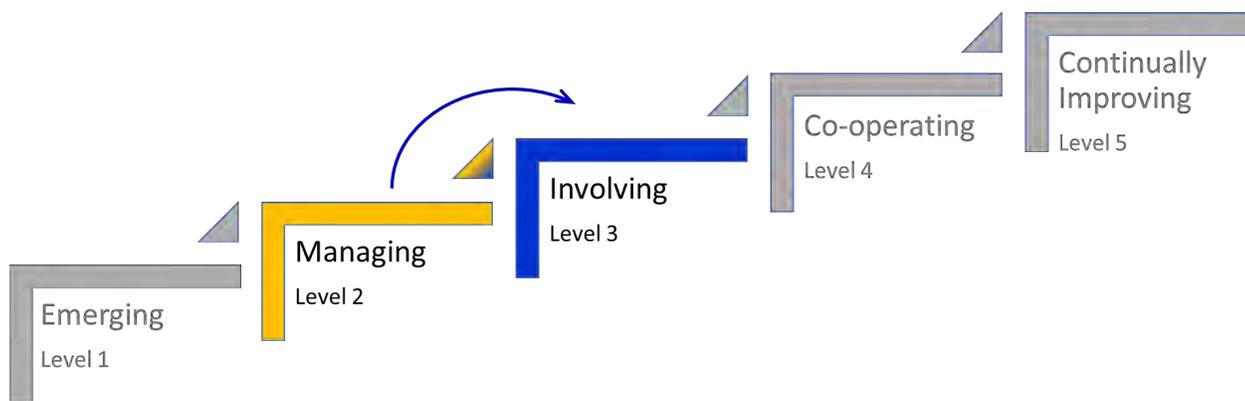


Figure 5: NS maturity level for safety culture Element 1.

²³ NS has developed a 2-day in person curriculum to improve communication. This is based on the Stanley McChrystal Team of Teams model. NS indicates that several hundred frontline leaders have completed the program and an additional 1,400 are scheduled to complete the program this summer.

Element 2: The Railroad Practices Continuous Learning

NS has not responded convincingly to FRA's recommendations and significant findings from the 2022 NS System Audit, such as with NS' operational testing and inspection program. Without a properly administered program, NS could be hindered in monitoring conditions on the railroad or targeting resources successfully.

Results from survey interviews revealed an average response of 4.79 to questions related to perceptions of NS practicing continuous learning across all participating employees. Maintenance of way employees provided the highest rating (6.10) followed by supervisors (6.09) while mechanical employees had the lowest (3.77). Those employees with less than 1 year of experience provided the highest rating (5.32) and those with 21-30 years of experience had the lowest (3.90). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

The semi-structured interviews revealed that newer resources such as Comply365 allow employees to look up any needed information on company-provided devices. Additionally, there is online training available for employees. In both the semi-structured interviews and survey feedback, an overwhelming majority of craft employees (and their labor representatives) cited disappointment in this shift to an online platform for learning and railroad safety related information. The reasons for this varied. Some indicated a preference for face-to-face training and the opportunity to interact and ask questions of an instructor. Others indicated that the online learning platform didn't seem to have as much priority and prominence as classroom trainings. A few employees indicated that while there were many training and educational resources available through the NS online learning platform, there was not enough time allocated for employees to take advantage of these resources. Some employees reported a desire to be informed of safety information such as lessons learned after a near miss during an in-person safety briefing or safety standdown rather than having to locate the information online. Lastly, some employees who responded to the survey indicated that training they received was more focused on rules and regulatory compliance than on general safety best practices.

Comments such as "we rarely go over safety incidents," "very little information is given after an incident," and "safety concerns and accidents used to be discussed at safety briefings, but some locations have done away with these briefings" when considered with other available data, including the deployment of the Comply365 resource, indicate that this element is beginning to move from the *emerging level* to the *managing level* of safety culture maturity as Figure 6 shows. Note that all available data refers to data from

the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

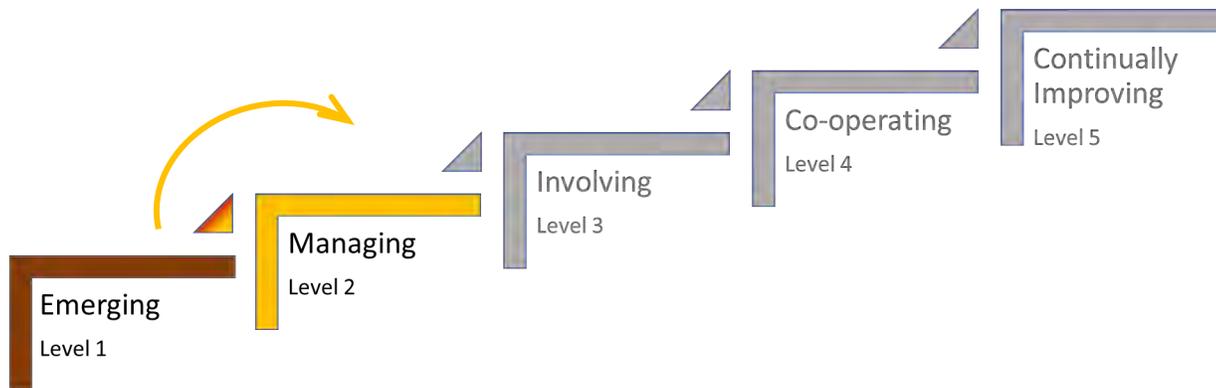


Figure 6: NS maturity level for safety culture element 2

Element 3: Decisions Demonstrate Safety is Prioritized Over Competing Demands

In March and April 2023, FRA performed a focused inspection into NS’ compliance with FRA signal regulations, identifying over 100 defects across 95 miles of NS territory. Further, reviewing the maintenance and inspection history of the territory identified a failure to prioritize critical safety work necessary to ensure safe operation. FRA observed that NS did not have consistent management oversight of the territory nor staff to perform critical repairs, noting many instances when NS maintainers were covering multiple territories and NS had multiple vacancies in its signal management overseeing work in the territory. This observation is inconsistent with this element of safety culture.

FRA’s focused inspection also included a detailed review of NS’ wayside detector program. As part of those efforts, FRA inspected NS’ wayside detectors along multiple hazardous material routes, reviewed the training for wayside detector installation and maintenance, and reviewed in detail the processes, methods, and decision-making performed in the dispatch center to monitor and respond to reported wayside detector alarms (both critical alarms and trending alarms). Clear, documented decision-making to ensure the safety of personnel, equipment, infrastructure, the public, and the environment in response to an alarm is a key

component of prioritizing safety over competing demands. NS' current procedures fall short of this standard. FRA noted NS' method of monitoring and communicating alarms did not reflect the urgency of an alarm event, and the criteria and decision-making process for taking action when either a trending alarm or critical alarm is received is not documented nor consistently actioned.

Results from survey interviews revealed an average response of 4.91 to questions related to perceptions that safety is prioritized over other competing demands across all participating NS employees. Maintenance of way employees provided the highest rating (6.60) followed by supervisors (6.22) while mechanical employees had the lowest (3.90). Those employees with less than 1 year of experience provided the highest rating (5.84) and those with 21 – 30 years of experience had the lowest (3.64). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

As with the responses regarding the railroad leadership's commitment to safety, responses from employees surveyed indicate that there is a perception that there has been a new commitment to reprioritize safety over other competing demands. This was noted in approximately 20% of free form feedback received in relation to this safety culture element. However, an almost equal percentage of employees reported that safety continued to be a lower priority than production and train movement. A handful of employees (approximately 5) indicated that safety was listed as the fourth priority in documents that listed NS' responsibilities. There were also a handful of employees (approximately 4) that indicated their perception that safety had been reprioritized to be the first among competing demands with other citing new initiatives centered around "everything starts with safety."

Comments such as "safety committees are being developed," "we are told to be safe but still feel pressure to work quickly," and "NS has started to move in the right direction" when considered with other available data indicate that this element is at the *managing level* of safety culture maturity, the second of the five levels of progression towards safety culture maturity, as shown in Figure 7. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA's 2022 System Audit of NS, and enforcement efforts over the last 12 months.

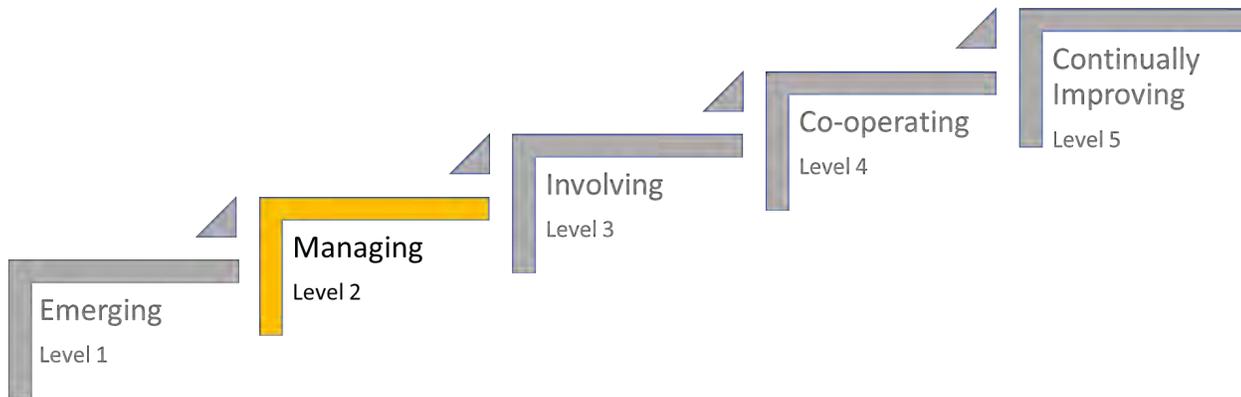


Figure 7: NS maturity level for safety culture element 3.

Element 4: Reporting Systems and Accountability are Clearly Defined

As stated above, FRA’s assessment into NS’ processes and procedures to respond to wayside defect detectors has identified that the roles and responsibilities for the identification and action of wayside detector alarms and alerts is unclear, and the single point of responsibility for decision-making is not fully informed. NS has taken some actions to improve its processes and procedures, including eliminating remote work options for the ATC desk, and stationing at least two employees at the desk, but further improvements are needed to eliminate single points of failure and ensure consistent actions are taken for both alarms and alerts.

Results from survey interviews revealed an average response of 4.76 to questions related to perceptions that reporting systems and accountability are clearly defined across all participating NS employees. Maintenance of way employees provided the highest rating (6.36) followed by supervisors (6.33) while operating craft employees (TY&E) had the lowest (3.94). Those employees with less than 1 year of experience provided the highest rating (5.49) and those with 21 – 30 years of experience had the lowest (3.60). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

Responses from the majority of craft employees who provided free form feedback on this element of safety culture indicated that systems are in place, but that follow-through is often lacking. Specifically, employees who provided free form feedback expressed issues with (1) navigating the online reporting system, (2)

perceived lack of follow up after reporting concerns to the relevant safety committee, (3) perception that upper management does not take action when an issue cannot be handled by a local or middle manager, and (4) perceptions that concerns that would require a significant investment of time or financial resources are ignored. Employees further indicated that communication throughout the lifecycle of a concern – from its initial reporting to a frontline supervisor to the final resolution – is inconsistent. The majority of employees who expressed this opinion indicated they had stopped bringing concerns to management as they felt that it would not result in a corrective action taking place.

More than half of the frontline supervisors who provided free form feedback for this safety culture element indicated that they are frequently reminded by company leaders to follow-up and provide feedback when concerns are raised. This example provides an illustration of a recurring and consistent finding throughout the safety culture assessment: there was frequently a disconnect observed between perceptions of supervisors and craft employees.

Of note are comments provided from labor leaders in semi-structured interviews as well as in about 10% of comments from survey interviews that many employees across the NS system, crafts, and years of experience do not report concerns to management out of fear of retaliation or disciplinary action; these comments when considered with other available data indicate that this element is in the *emerging level* of safety culture maturity as Figure 8 shows. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

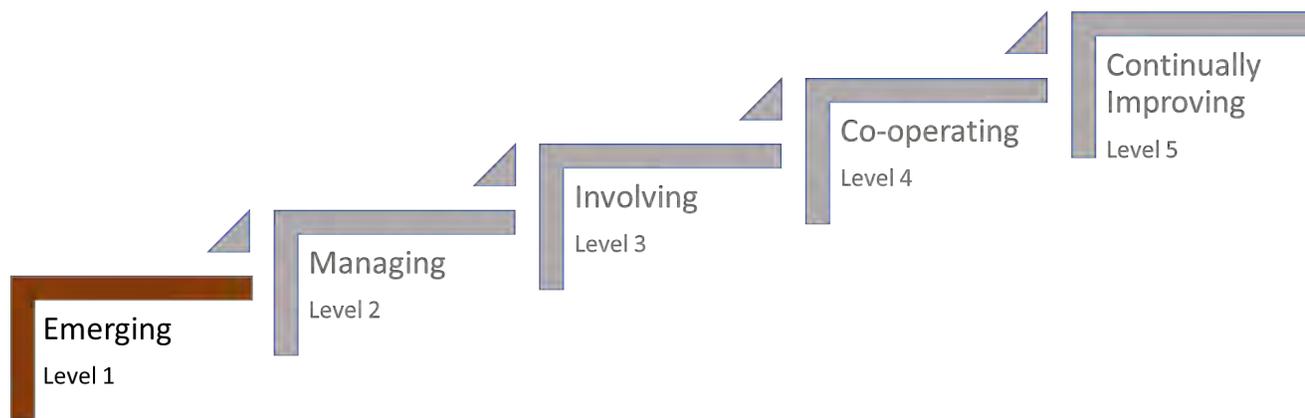


Figure 8: NS maturity level for safety culture element 4

Element 5: There is a Safety Conscious Work Environment

FRA's signal focused inspection of NS' training center identified excellence in the installation of railroad components and signaling solutions to aid training purposes, but FRA's operating practices audit of engineer and conductor training identified significant concerns regarding the duration and quality of training. Further, NS has failed to communicate a clear statement of responsibility for safety. AMD staff noted that in several courses they observed at the NS Training Center in McDonough, GA instructors were "teaching to the test" rather than using these classroom sessions to provide new employees with real-world information that would provide context and ground the rules and regulations of railroading in a foundation of safety. Simply stated, AMD staff observed that instruction was focused more on the memorization and recall of rules rather than on developing context-based foundational knowledge.

Results from survey interviews revealed an average response of 5.25 to questions related to perceptions that there is a safety conscious work environment across all participating NS employees. Maintenance of way employees provided the highest rating (6.64) followed by supervisors (6.27) while operating craft employees (TY&E) had the lowest (4.83). Those employees with less than 1 year of experience provided the highest rating (5.68) and those with 21 – 30 years of experience had the lowest (4.66). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

This element received the highest rating from frontline supervisors and employees who completed survey interviews. Feedback on this element was varied with no clear trends. A few of the more frequently cited comments are presented below in anecdotal findings.

Responses from survey comments as well as the semi-structured interviews indicated that conducting safety briefings before beginning work was universally seen as valuable. Some employees and supervisors indicated that these briefings happen regularly. Interviews with NS leadership also emphasized the regular safety briefings occurring throughout the NS system. However, other employees and supervisors indicated safety briefings were sporadic or had stopped entirely. The comments were evenly split among employees and frontline supervisors, with half indicating these safety briefings happened regularly and half indicating they were sporadic or nonexistent. NS has indicated that Job Safety Briefings are required by Operating Rule 1. The job briefing is not at the discretion of a manager. Job Safety Briefings are required: (1) at the beginning

of each job, (2) when the work changes, (3) when the work becomes confusing or new tasks are started, and (4) anytime a rule violation is observed. Job safety briefings are conducted by employees and are regularly led and/or audited by supervisors.

Comments such as “signs are convenient,” “visual aids are helpful,” “track and mechanical departments diligently work to maintain easy-to-see markers for clearance points on tracks,” and “signs are helpful, but some are faded” when taken in consideration with other available data indicate that this element is moving from the *involving* to *cooperating level* of safety culture maturity, as Figure 9 shows. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

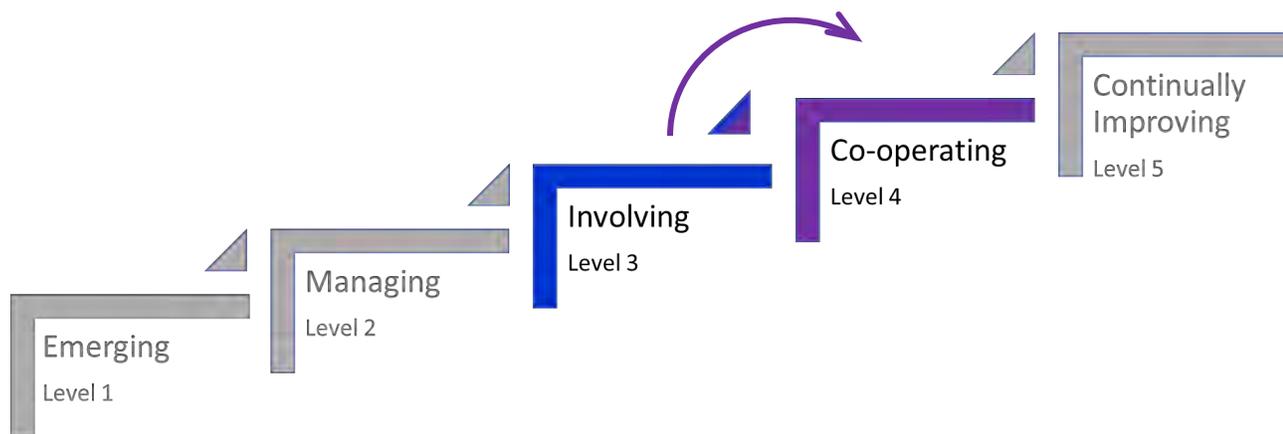


Figure 9: NS maturity for safety culture element 5

Element 6: Employees Feel Personally Responsible for Safety

During FRA’s ongoing IJA audit of NS’ 49 CFR Part 242 Conductor Certification Program, FRA observed that certified conductors who support OJT for conductor trainees showed they individually are committed to safety.

Results from survey interviews revealed an average response of 4.90 to questions related to employees feeling personally responsible for safety across all participating NS employees. Maintenance of way employees provided the highest rating (6.56) followed by supervisors (6.47) while operating craft employees

(TY&E) had the lowest (4.02). Those employees with less than 1 year of experience provided the highest rating (6.00) and those with 21 – 30 years of experience had the lowest (3.82). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

Interviews with NS leadership and labor leaders as well as survey comments from frontline supervisors and craft employees all shared a general agreement that employees feel personally responsible for safety. Several across the NS system and at all levels cited the “I am coming home”²⁴ campaign as an example of this shared responsibility for safety. However, it should be noted that about one-third of labor leaders interviewed, as well as one-third of craft employees responding to the survey, expressed a reluctance to stop an unsafe action. Reasons for this included fear of retaliation, fear of disciplinary action, fear of punitive action taken against an employee if there was a disagreement between labor and management if an action or situation was unsafe, and perception that production must come before safety. When considering these comments along with other available data this element is at the *involving level* of safety culture maturity as shown in Figure 10. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

²⁴ The “I Am Coming Home” campaign was launched several years ago at NS and serves as the foundation of its behavior-based leadership model. It encouraged all employees to “look out” for one another and do the right thing, even when no one was watching. The messaging encouraged everyone to do the right thing, the right way, for the right reasons: so every employee can say to his or her family “I am coming home” at the end of each day.

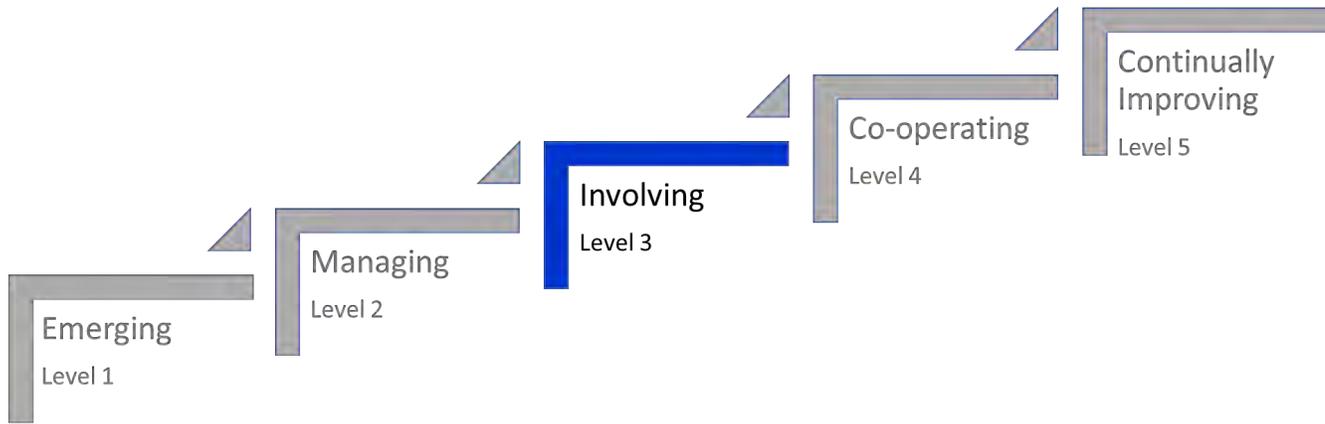


Figure 10: NS maturity for safety culture element 6

Element 7: There is Open and Effective Communication Across the Railroad

During FRA’s recent signal focused inspection detailed above, FRA observed a communication breakdown that allowed the territory to degrade to the levels found in the inspection. Miscommunication at the local level led to work not being completed as required. Specifically, a malfunctioning underground cable was repaired by placing an unprotected temporary cable above ground. This temporary repair was not permanently addressed for several months. Further, FRA notes that clear communication of the staffing challenges in this territory, as well as inconsistent management and leadership, may have led to the significant non-compliance with signal-related federal regulations.

Results from survey interviews revealed an average response of 4.93 to questions related to perceptions that there is open and effective communication across all participating NS employees. Maintenance of way employees provided the highest rating (6.48) followed by supervisors (6.07) while mechanical employees had the lowest (4.09). Those employees with less than 1 year of experience provided the highest rating (5.59) and those with 21 – 30 years of experience had the lowest (3.98). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

Inconsistencies in communication is a key finding in this safety culture assessment. Across all other safety culture elements, there is a common theme that communication needs to be improved. As noted above, there are several safety programs that NS has initiated about which employees were either unaware or

misinformed. Additionally, supervisors following-up on employees’ safety concerns, which promotes trust and encourages ongoing involvement in safety reporting, appears to be location and supervisor specific. The disconnect between management and craft employee opinions on safety culture further underscores this need for improvement. From available data and interviews it appears that messaging is largely effective between senior railroad leaders and frontline supervisors but messaging to craft employees is spotty and inconsistent. The reason for this inconsistency is unclear from the data collected. Comments such as “we need better communication at the local level as well as system wide,” “updates are typically posted on the electronic bulletin board, but employees have to search for them,” and “information is available but at times not easy to locate” when considered with other available data indicate that this element is moving from the *emerging* to *managing* level of safety culture maturity, as shown in Figure 11. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

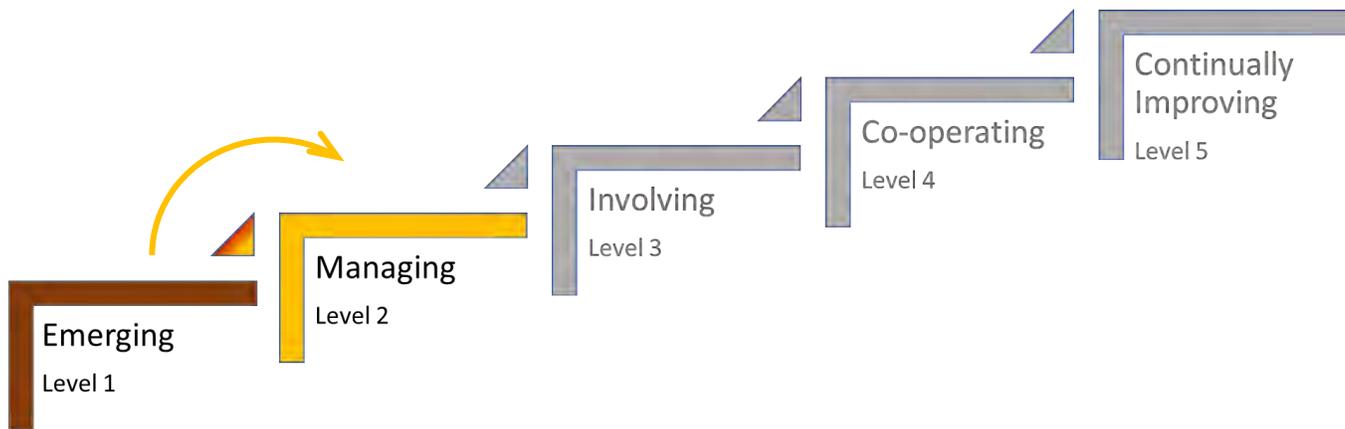


Figure 11: NS maturity for safety culture element 7

Element 8: Mutual Trust is Fostered Between Employees and the Railroad

Overall, a general theme emerged from the focused inspections performed as part of this safety culture assessment: a lack of trust between employees and management. During FRA’s signal focused inspection, FRA observed poor teamwork and leadership in the territories inspected. Specific findings to support this included a territory without consistent frontline supervision for 18 months, and observations of employees

performing maintenance tasks for which they had not received proper training. Further, there is discontent with NS' training program and a general feeling by craft employees that NS is not committed to ensuring employees are trained and prepared to safely perform their tasks. This perception by employees that NS is not providing them with the resources needed to perform their jobs safely is an example of this lack of trust.

Results from survey interviews revealed an average response of 3.58 to questions related to perceptions that there is mutual trust between employees and the railroad across all participating NS employees. Maintenance of way employees provided the highest rating (5.44) followed by supervisors (5.00) while operating craft employees (TY&E) had the lowest (2.71). Those employees with less than 1 year of experience provided the highest rating (4.03) and those with 21 – 30 years of experience had the lowest (2.84). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

This element received the lowest rating of all safety culture elements from frontline supervisors and employees who completed survey interviews. Interviews with NS leaders indicate they believe trust is fostered through listening to employee perspectives, soliciting feedback, and seeking out areas to collaborate. To support this, NS has been engaging employees in new programs designed to foster trust. However, building trust is a time-intensive activity. Currently, interviews with labor leaders indicated there is a lack of trust between craft employees and management. Comments from craft employees and frontline supervisors completing survey interviews also indicated the lack of trust between craft employees and management. When all this information is considered together, this element is at the *emerging level* of safety culture maturity, as shown in Figure 12. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA's 2022 System Audit of NS, and enforcement efforts over the last 12 months.

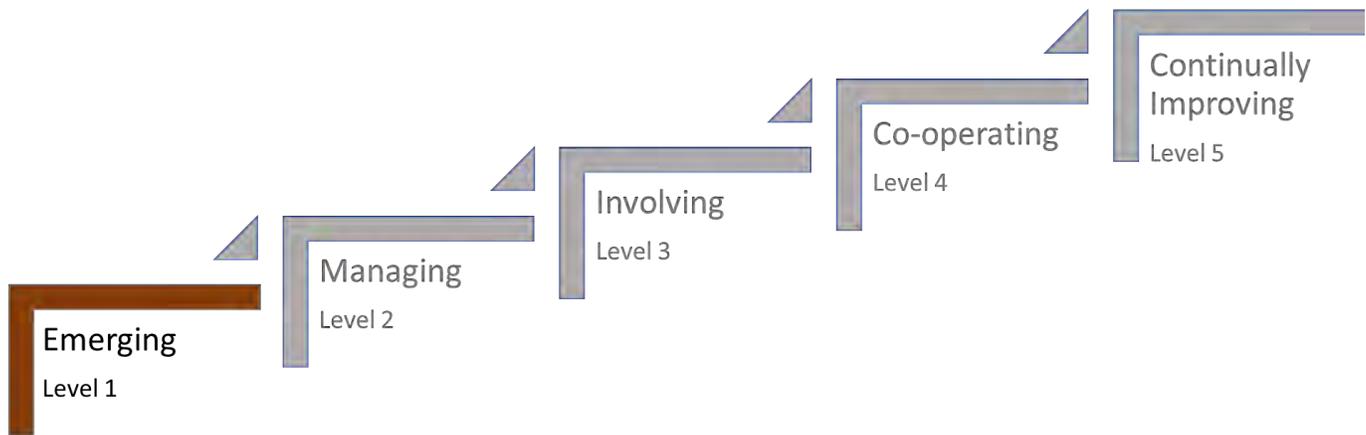


Figure 12: NS maturity for safety culture element 8

Element 9: The Railroad is Fair and Consistent When Responding to Safety Concerns

Results from survey interviews revealed an average response of 4.13 to questions related to perceptions that NS is fair and consistent in responding to safety concerns across all participating NS employees. Supervisors provided the highest rating (6.00) while mechanical employees had the lowest (3.39). Those employees with less than 1 year of experience provided the highest rating (4.95) and those with 21 – 30 years of experience had the lowest (2.83). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

This is another safety culture element that illustrates the disconnect between opinions of supervisors and craft employees. NS leadership interviews indicate that there is a progressive discipline policy, but that training, coaching, and counseling are explored before higher levels of disciplinary action are pursued. Survey comments from frontline supervisors are generally consistent with this view of the NS discipline policy. Maintenance of way employees who provided free-form feedback indicated that discipline policies for their craft were generally applied consistently and as outlined in collective bargaining agreements.

Interview responses from labor leaders and survey comments from craft employees, with the exception of maintenance of way employees, have a different perspective regarding the NS discipline policy. Overall, the discipline policy is perceived as being inconsistently applied. Furthermore, the majority of comments from frontline employees indicated that a punitive disciplinary action is taken before any additional training or

coaching is offered to an employee. Several labor leaders indicated that the current discipline policy is ineffective as it does not result in additional employee learning or improved safety. Some interviews indicated NS’ “Start Program” for discipline is not being followed and that disciplinary action received depends on subjective factors. Although discipline policies are established and agreed to through collective bargaining agreements, the concern seems to be that these policies are not being followed as agreed. When all this information is considered together, this element is at the *emerging level* of safety culture maturity as shown in Figure 13. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA’s 2022 System Audit of NS, and enforcement efforts over the last 12 months.

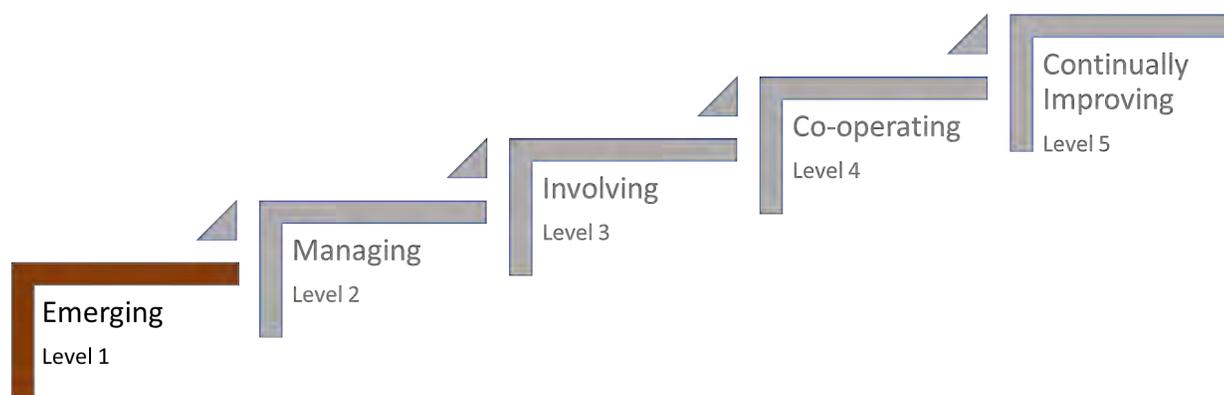


Figure 13: NS maturity level for safety culture element 9.

Element 10: Training and Resources are Available to Support Safety

FRA focused inspections of NS’ training program identified inconsistencies in compliance with FRA’s regulations. Although the content of training for many craft employees (other than conductors and engineers) appeared comprehensive, many employees complained that opportunities for taking the training were not given. In addition, training of engineers and conductors was observed to be of limited duration and poor quality. As described above, FRA worked with NS for nearly two years to bring its Part 242 Conductor Certification Program into compliance. FRA sent NS a letter on June 14, 2023, identifying grave concerns requiring the railroad’s immediate attention. For example, FRA raised concerns with the duration and content of the conductor training program. In the June 2023 letter, FRA directed NS to immediately increase the

duration of its training program for new conductors, re-train employees who were trained under the non-compliant program, and address the other findings discussed in the letter. On June 19, 2023, NS provided a written response outlining actions in response to the FRA's concerns. NS provided timelines that address the three issues mentioned above and outlined its plan to resolve them. FRA is currently reviewing NS' response.

Results from survey interviews revealed an average response of 4.42 to questions related to perceptions that training and resources are available to support safety across all participating NS employees. Supervisors provided the highest rating (5.92) while operating craft employees (TY&E) had the lowest (3.61). Those employees with less than 1 year of experience provided the highest rating (5.14) and those with 21 – 30 years of experience had the lowest (3.69). All values reported are out of 7 where 7 is strongly agree and 1 is strongly disagree. Higher values reflect stronger opinions of positive safety culture.

Consistent with the feedback received regarding the safety culture element “Railroad Practices Continuous Learning,” the majority of survey comments discussed the reliance on online training. Again, craft employees indicated a preference for more classroom learning than was currently available to them.

Leadership interviews highlighted recertification, annual training, job aids, and resource guides as training resources to support safety. There was also discussion in these interviews of having annual classes to address safety concerns observed in the field. These in-person classes are still in the planning stage.

Labor leader interviews indicated, consistent with survey comments, that the majority of training is required rules training. There are additional training courses available through the NS online portal, but the perception is those trainings would have to be done on the employee's own time.

Comments including “information is available on the computer but there is no in person training,” “training is quite good but is infrequent,” “I would advocate for a return to open classroom settings for training,” and “information is available online, but regular workload limits the time to complete” when taken in consideration with other available data indicate that this element is at the *involving level* of safety culture maturity, as shown in Figure 14. Note that all available data refers to data from the semi-structured interviews, surveys, focused inspections, Training Center in McDonough, GA observations, status of recommendations from FRA's 2022 System Audit of NS, and enforcement efforts over the last 12 months.

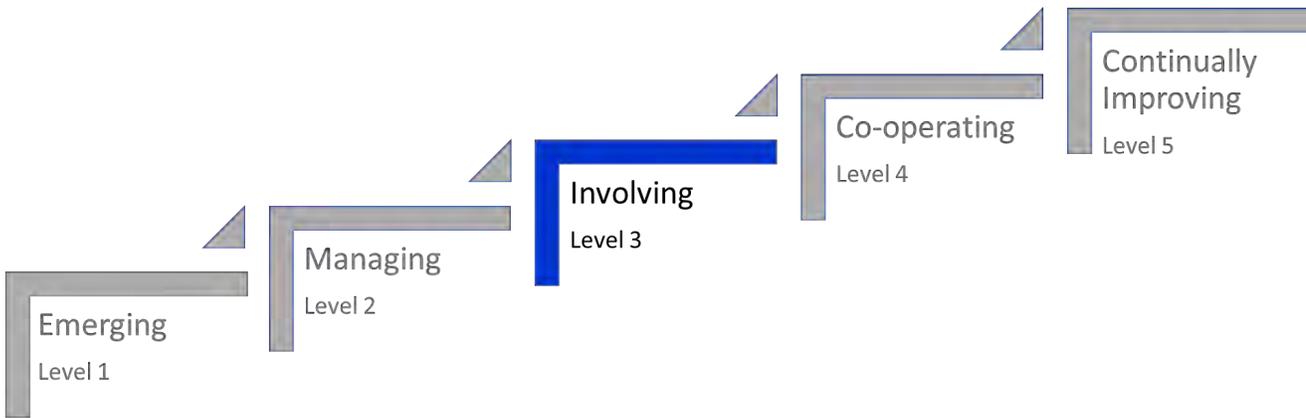


Figure 14: NS maturity level for safety culture element 10

Anecdotal Findings

As indicated above, NS having a safety conscious work environment was the highest rated safety culture element across all employees interviewed. Comments related to this element were too varied to include with other findings related to this safety culture element, but some comments are reported here to provide insight into the current state of the work environment. Although it was generally agreed that the overall NS work environment was safety conscious,

- Some comments indicated that signs and markings have become faded and hard to read over time. One commentor specifically requested that there be an annual plan to repaint these markings because of this issue.
- A few comments indicated that some markings are difficult to see in areas where there is significant snowfall.
- A handful of comments indicated that there are some areas where signs or markings provide information that is inconsistent or conflicting. In these instances, employees are unable to discern which information is correct and which should be ignored.
- Commenters observed better lighting has been provided for critical areas, especially during shove operations.
- Several comments specifically called out the issue of a safety conscious work environment, as it relates to signs, markings, and other visual aids, as something NS does well.

Managers perceived morale was high prior to the COVID-19 pandemic. Additionally, management noted that the engineering craft employee numbers were approaching pre-pandemic staffing levels.

Management's perception is that the communication channel within the engineering department (maintenance of way) is "pretty transparent." In contrast, many MP&E craft employees expressed a feeling that communication with frontline management was almost non-existent. Likewise, frontline MP&E managers reported communication with mid-level management as nearly non-existent.

Comments from mechanical employees indicated a feeling that frontline supervisors provide oversight only when FRA personnel are on the property.

Employees from several crafts expressed a concern that, although there were a great deal of online training and continuing education resources available for employees, there was no time to take advantage of these opportunities during duty hours. Some craft employees indicated that beyond "rules class," which provide training required by law or NS policy, any other supplemental safety or enrichment training had to be completed on an employee's own time. NS leadership has indicated that no employee is required to complete training while off duty and employees are able to take training during work hours when the opportunity exists. Training is accessible to employees off duty, but it is not an expectation that training be completed during off duty hours.

FRA staff observed limited safety signage or safety promotional materials in the NS Training Center in McDonough, GA. This is one example of a missed opportunity for NS as having this information prominently throughout the training center could communicate the importance of safety and the NS safety initiatives from the start of an employee's career with the railroad. Such materials could also be a visual reminder to reinforce the information learned in the classrooms and set expectations for how safety promotional materials are presented in the field.

Section 3.4 Conclusions

Positive safety culture is focused on continuous improvement and requires commitment and engagement from leaders, supervisors, and frontline employees. Fostering and maintaining a positive safety culture is an on-going activity that is evidenced by gradual change over time. FRA found the overall safety culture

maturity at NS to be in the *involving level*, although individual NS safety culture elements may be leading or lagging in maturity. This middle level of safety culture maturity reflects both the positive changes and renewed commitment shown by NS' leadership to improve safety as well as the areas where NS continues to operate in a manner that is reactive and based on compliance with minimum safety requirements of federal regulations and industry standards. For example, FRA assessed NS' progress in implementing corrective actions and found inconsistent progress. NS has completed some corrective actions but has not even initiated others. Likewise, when considering recommendations made as a result of the 2022 NS System Audit, NS has implemented some changes that are responsive to FRA recommendations but has indicated it will take no action on others when the recommendation exceeds minimal requirements set by regulation. Committing to corrective actions, providing realistic deadlines, and making progress in addressing the issues FRA identified would send a clear message that NS leadership is committed to safety.

The NS Safety Assessment indicates that some aspects of NS' safety culture are showing signs of increasing maturity. For example, recent changes NS' leadership made are apparent, as data suggest NS is moving from the managing to involving level of safety culture maturity in element one. Additionally, NS' partnership with Atkins Nuclear Secured to evaluate the NS safety culture further underscores this commitment. FRA urges NS to leverage its partnership with Atkins Nuclear Secured to review and act on the findings and recommendations in this report. FRA encourages NS to continue to foster the policies and actions that have led to these positive results, determine how these successes can be improved upon, and how this information can be leveraged in other areas of the NS safety culture.

In other safety culture elements, however, NS has considerable room for improvement. For example, data indicate there is a divide between NS leadership's commitment to fostering trust throughout the railroad and the perceptions of the state of trust that exists today between employees and frontline supervisors, as well as within the railroad as a whole. Interviews with NS leadership show a consistent commitment to fostering trust between senior leaders, middle and frontline managers, and craft employees. However, lack of trust was a recurring issue among employees and may be in some ways exacerbated by the perception of employees of some crafts that discipline is not consistently or fairly applied. FRA understands that developing trust is a time intensive effort and appreciates that NS leadership recognizes the importance of trust in its operations. NS should ensure that middle and frontline managers as well as craft employees are aware of leadership's commitment to fostering trust. However, trust is neither a top down nor a bottom-up process. It can only

grow and thrive where there is equal participation from all involved. With that in mind, FRA recommends that NS solicit feedback from its employees on their perceptions of the current state of trust at NS and how that could be improved. Engaging employees in the process demonstrates not only leadership's commitment but also its trust in employees. Furthermore, the commitment from leadership to solicit feedback and then act on suggestions can work to motivate employees throughout the process and create an open and approachable collaborative environment.

Training is another area where FRA saw room for improvement. The NS Safety Assessment suggests that although training of craft employees is comprehensive, training of conductors was gravely inadequate and non-compliant with FRA regulations. NS has provided a written response outlining actions in response to FRA's concerns that includes a resolution plan and timeline. Data from the surveys indicate that some employees, regardless of craft, do not believe there is sufficient on duty time to complete continuing training and education, other than that which is required by regulation. NS reaffirmed with FRA that employees are not required to complete mandatory training during off duty times. NS also indicated that training could be taken during on duty periods as the opportunities arise. This also speaks to the disconnect between perceptions of craft employees and leadership. While NS leaders permit trainings (not just "rules class" training) to be completed on duty, it seems to be the experience of craft employees that, with other job demands, there are seldom, if any, opportunities to take advantage of additional trainings.

As NS considers ways to provide additional opportunities for employees to complete trainings, NS should also consider the methods that are used to administer training. NS should consider offering more than one delivery method for trainings to account for the differences in learning styles and preferences of adult learners. In the absence of alternatives to online training, NS should work to present these trainings in such a way as to engage with as many different types of learners as possible. For example, online trainings can incorporate text, narration, video segments, interactive features, and the ability to apply what has been learned.

Finally, a pervasive thread running through comments in each safety culture element as well as observations during inspections and the 2022 NS System Audit related to weaknesses and inconsistencies in NS' communications about safety. Given the way communications affected so many other safety culture elements, making improvements to this one element could have positive ramifications for many of the other elements. It is possible that this communication disconnect is a result of employees being unaware of where

to find the most recent, relevant information. It is also possible that as NS moves to more reliance on the electronic distribution of information, like other railroads and other industries more generally have done, employees are continuing to look at older communication systems out of habit or preference. NS should work with employees to create more awareness about where to find relevant information as well as to keep employees apprised of what former information distribution systems are being gradually retired or removed completely.

CHAPTER 4: OVERALL FINDINGS AND RECOMMENDATIONS

The demands of railroad operations continue to require adaptation and innovation. However, with change comes risk, and adaptation and innovation cannot be allowed to degrade fundamental aspects of railroad safety. Risks need to be managed and mitigated through people, processes, and training. Key to all of this is safety culture, a commitment to continuous improvement, and a focus on leading indicators of safety.

When information from NS responses to prior FRA recommendations, inspections, and safety culture assessment are considered together, several common themes emerge. Regardless of the source of the finding, the areas where NS has the greatest opportunities to improve are rooted in the following fundamental safety culture elements:

- Element 7: There is open and effective communication across the organization
- Element 8: Employees and the organization work to foster mutual trust
- Element 10: Safety efforts are supported by training and resources

Taken as a whole, this safety assessment also shows numerous examples where NS seems more concerned with compliance with minimum safety requirements of federal regulations and industry standards rather than understanding and seeking to address safety concerns that fall outside the boundaries of existing rules and regulations.

FRA notes NS is working to take appropriate actions in many of these areas as demonstrated by factors such as the partnership with Atkins Nuclear Secured to assess safety culture, and the maturity of safety culture element 7 moving from the emerging level to the managing level.

Inadequate or inconsistently applied resources and support for frontline supervisors is common to all findings. Each finding from this Assessment has an element that relates to leadership skills and empowerment of frontline supervisors. Frontline supervisors represent the pivotal link where leaders' policies and directives are translated into the actions that drive railroad operations. Frontline supervisors' daily interactions with employees are intended to ensure that work is compliant with all rules and regulations, but also to ensure the work is done safely. Their ability to communicate clearly determines whether employees have a clear understanding of what is expected of them, and what railroad policies require. The consistency with which frontline supervisors apply discipline and the tenor of their routine communications

affect the trust between management and labor. For all frontline supervisors to manage operations consistently, efficiently, fairly, and safely, they must be equipped with sufficient skills and resources. In turn, not equipping frontline supervisors with the skills and resources to put safety first has a direct impact on the safety of NS' operations as well as safety culture.

Finding 1: NS Communications are not always open and effective and require improvement.

In its review of critical operational elements, FRA identified important instances where weaknesses or lapses in communications led to employees and frontline supervisors acting on incomplete information; in some instances, the lack of procedures led to either delay in action, or failure to take appropriate action. For example, NS relies on emails from the ATC desk to dispatchers, which could slow communications, particularly if the single employee working the desk took a break or was addressing other issues. FRA also noted that NS lacked procedures for escalating unanswered calls from the dispatch floor to the wayside desk. In addition, FRA noted that the documentation showing the location of placarded hazardous materials cars, which is information that could be extremely valuable to emergency responders in the event of a derailment, was not always correct.

Survey data from both employees and frontline managers indicated there is a perceived lack of communication from senior and middle managers to frontline managers and employees. Comments indicated this communication breakdown was particularly apparent in obtaining follow up information relating to safety concerns raised by employees and frontline supervisors that required action from middle or senior leaders. When frontline supervisors are unaware of the status of outstanding concerns, new initiatives, or changes in policy, this impacts their ability to be effective and perform optimally and safely.

Recommendations:

1. Evaluate the communications processes surrounding responses to wayside detector alerts and alarms to identify and eliminate gaps and delays.
2. Develop a new (or refine existing) policy that outlines how information will flow throughout the organization.
3. Review NS' communication policy and update it, as appropriate.

4. Inform all levels of management as well as employees about the communication methods and protocols NS will use to disseminate information.
5. Clarify where specific information can be located and what (if any) information is available via more than one method.
6. If older communications systems (e.g., oral briefings, posted signage) are being phased out or eliminated in favor of electronic communications, ensure all employees are aware of this change and able to access the electronic systems.

Finding 2: NS employees and the organization do not always work to foster mutual trust.

While conducting the safety culture assessment, FRA encountered multiple instances of lapses in trust between employees and their frontline supervisors. Comments from employees included assertions that agreed-upon discipline procedures are not applied uniformly or fairly. In some instances, employees refused to participate in a structured interview because of concerns that doing so might lead to some sort of punitive actions from their supervisors. In other instances, frontline supervisors indicated they believed they should be present when employees were interviewed by FRA, although this may have been due more to their lack of trust in FRA. During the critical operational elements assessment, FRA found that NS has designated “qualified instructors” without seeking concurrence or non-concurrence from designated employee representatives. Although this is primarily an instance of a deficiency in NS’ training programs, it also serves as an example where NS does not include employee representatives in certain safety programs, even when required to do so by regulation.

Recommendations:

1. Participate in the Confidential Close Call Reporting System (C³RS) to allow employees to anonymously report safety close calls without fear of discipline or enforcement.
2. Continue to explore ways to increase trust.
3. Review existing discipline programs and ensure their application is consistent across locations and managers.
4. Develop and implement a policy for responding promptly and as publicly as possible to complaints.

5. Engage with employees and solicit feedback on their perceptions of the current state of trust at NS and how that could be improved and use that feedback to create action items designed to foster trust.
6. Include employees, and their representatives, in as many processes as possible including when required by regulation to consult with directly affected employees such as with 49 CFR Part 271: Risk Reduction Programs and Fatigue Risk Management Program.

Finding 3: NS Training and resources are not always effective at supporting safety efforts.

FRA’s findings in the 2022 NS System Audit often illustrated a need for improved training. For example, NS frontline supervisors were not aware of the requirements of the NS Critical Incident Stress Plan, resulting in inconsistent application of the provisions for offering relief to employees. In addition, frontline supervisors and employees were not complying with requirements of their CWR plan at the time of the 2022 audit. Interviews during the safety culture assessment also suggested that for some employees, the increasingly digital, online presentation of training materials was not as effective, and employees raised concerns that training for important safety topics, if they were elective, had to be undertaken during off-duty time

In its critical operational elements review, FRA noted that NS’ Disaster Recovery Center training did not adequately cover all necessary materials. FRA also found that the time allotted to in-class training for conductor trainees is insufficient, and the OJT training is deficient in structure, consistency, and oversight. All of these factors have led to an increased risk of trainees acquiring unsafe work practices. In addition, NS has designated “qualified instructors” without seeking concurrence or non-concurrence from designated employee representatives. The ongoing deficiencies with NS’ Conductor Certification program can be linked to multiple tragic events, suggesting that NS’ evaluation of training is not leading to effective program improvements.

During the critical operational elements review, FRA also noted that frontline supervisors seem to lack general signal knowledge and the ability to consistently apply railroad signal testing and maintenance procedures. FRA observed inconsistencies in the skill levels of signal employees in testing, installing, and maintaining wayside detectors. The lack of consistency strongly suggests inadequacy in either training materials or opportunities to take the training.

Recommendations:

1. Create additional opportunities for employees to complete both required “rules class” trainings as well as supplemental safety training courses offered by NS during on duty hours. Consider taking concrete steps to set aside specific duty time for employees to participate in safety training opportunities.
2. Explore additional methods for evaluating the effectiveness of training, and develop and implement corrective actions in response to any findings.
3. Consider the methods that are used to administer training and explore the feasibility of offering more than one delivery method for trainings to account for the differences in learning styles and preferences of adult learners. In the absence of alternatives to online training, utilize a variety of instructional methods, such as text, narration, video segments, interactive features, and the ability to apply what has been learned to engage with as many different types of learners as possible.
4. Review the training offered to frontline supervisors and make changes, as needed, to ensure that frontline supervisors are trained in leadership skills and understand how they are empowered to do their jobs. Ensure that frontline supervisor training is of sufficient length, quality, and content to enable supervisors to lead their teams effectively and safely.

Finding 4: NS frequently focused solely on compliance with minimum safety standards.

FRA consistently found during this Assessment that despite the areas where NS is working to make improvements to address risks throughout its system, there are still several areas where NS is still focused on compliance with minimal regulatory standards.

Positive safety culture is focused on continuous improvement and requires commitment and engagement from leaders, supervisors, and frontline employees. Fostering and maintaining a positive safety culture is an on-going activity that is evidenced by gradual change over time. FRA recognizes the positive changes and renewed commitment shown by NS’ leadership to improve safety. However, FRA continued to observe areas where NS continues to operate in a manner that is reactive and based on compliance with minimum safety requirements of federal regulations and industry standards. FRA assessed NS’ progress in implementing corrective actions and found inconsistent progress. NS has completed some corrective actions but has not initiated others. NS has implemented some changes that are responsive to FRA recommendations from the

2022 NS System Audit but has indicated it will take no action on others when the recommendation exceeds minimal requirements set by regulation.

Recommendations:

1. Leverage partnerships with recently engaged safety culture consultants to review and act on the findings and recommendations in this report. Identify the policies and actions that have led to the observed positive results and determine how these successes can be improved upon, and how this information can be leveraged in other areas of the NS safety culture.
2. Explore ways, including developing corrective actions for previous safety recommendations which may go beyond minimal regulatory standards, to move from systems that are reactive and focused on lagging safety indicators to those which are proactive and focus on leading safety indicators.
3. Consider FRA’s findings when conducting hazard identification and risk analysis as well as in the implementation of NS’ Risk Reduction Program and Fatigue Risk Management Program.

General Conclusion

Results from the NS Safety Assessment demonstrate that the NS safety culture is in the *involving level* of maturity. While FRA recognizes the efforts that NS has taken to be responsive to FRA recommendations and take proactive safety measures, there are still areas where NS continues to use minimum standards set by regulations as a benchmark for efficacy. FRA recommends NS work to advance its safety culture maturity by setting policies and procedures that look to proactive measures and continuous improvement goals.

FRA will continue to work in partnership with NS and is committed to assisting NS in reaching its goals to improve safety for the benefit of its operations, employees, and the communities where it operates. To assist NS in its safety goals, as part of the FRA Safety Management Team weekly meetings with NS leadership, FRA will follow up with the recommendations made as part of this Assessment. Additionally, FRA will continue to follow up with NS regarding the implementation status of programs, policies, and procedures that were proposed to address previous FRA recommendations. FRA will continue to reiterate those recommendations that have previously been made to NS where NS has indicated they go beyond regulatory requirement as FRA believes implementing these recommendations is important for improved safety

outcomes. Lastly, FRA will continue to work with NS, including its workers, as a safety partner and seek out ways to work collaboratively to strengthen NS safety culture and improve overall railroad safety.

APPENDIX A: 2022 NS SYSTEM AUDIT RECOMMENDATIONS AND NS RESPONSES

2022 NS System Audit Recommendations		
FRA Recommendation	NS Response	Current Status
Critical Incident Stress Plans (CISP)		
Ensure covered employees understand NS CISP program requirements, what to expect from the program following a critical incident, and what relief options are available after a critical incident.	Although NS employees may not know the technical regulatory citations associated with the program, our employees are familiar with the relief options available to them after a critical incident.	NS originally indicated that they disagreed with FRA’s findings and would take no further action related to Part 272/CISP. However, in March 2023, NS reported that they are now working to establish policies, procedures, and trainings that are responsive to the recommendations in the audit report. FRA will follow up with NS and update the status of each item once there are more specific details available.
Develop and implement a program to increase awareness across the NS system regarding Part 272 requirements and the NS CISP plan.	NS is implementing an awareness campaign for the CISP, including incorporating the topic as one of the focus items for the January local safety and service committees and discussions on operating department safety calls. An awareness article was posted to FORGE in December 2022, and the plan has been posted to MyNS along with the Operations Web Portal. FORGE is an internal NS social media app. It’s a tool for “Forging a tighter NS community” across our decentralized 22 state system.	
Ensure that managers comply with the requirements of the NS CISP.	NS managers comply with the requirements of the CISP, and our craft employees are empowered to	

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
	<p>speaking up to seek relief, and also if they believe they are not offered appropriate relief</p>	
<p>Create a training program for managers:</p> <ul style="list-style-type: none"> • Include specific sections on Part 272 plan requirements, definitions of key terms including critical incident, directly involved employee, and covered employee, and penalties for non-compliance. • Include information on how to determine if an incident is a critical incident and what to do if unsure. • Provide information and examples of the steps that need to happen, according to the NS CISP plan, after a critical incident. • Provide information on the roles and responsibilities of those involved in a critical incident including not only the managers, dispatchers, and directly involved employees, but also any Peer Support and Employee Assistance Program (EAP) resources. • Include information on relief options available to covered employees. 	<p>The regulations do not require such a training program. NS includes the requirements of the CISP on its Operations Web Portal available to all employees.</p>	
<p>Document the basic information (e.g., name, date of incident, type of incident, etc.) for each employee</p>	<p>The regulations do not require such documentation. The program is available on the Operations Web</p>	

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
involved in a critical incident regardless of whether that employee sought relief from the remainder of the duty tour or additional assistance.	Portal for review by our employees and relief is provided as warranted and in accordance with the regulations and the NS program.	
Document relief options and additional assistance provided for those employees in need of these resources, as indicated in Part 272.	The regulations do not require such documentation. The program is available on the Operations Web Portal for review by our employees and relief is provided as warranted and in accordance with the regulations and the NS program.	
Provide EAP personnel with access to information on accidents/incidents reportable under 49 CFR Part 225, so personnel can ensure both NS internal policies and Part 272 requirements are being correctly implemented.	The regulations do not require such documentation. EAP personnel are aware of information as employees seek assistance from them.	

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
Hazardous Materials		
Ensure that rail cars carrying either a load or residue of hazardous material are inspected and are properly placarded prior to departure from the location where they are accepted or placed into trains.	NS has rules and training in place to ensure proper inspections and placarding prior to departure. It is important to note that railcars endure harsh environments and sometimes placards may be displaced during transportation at no fault of the railroad.	NS is emphasizing through training and management interaction its requirements to conduct safety and security inspections to comply with all parts of 49 CFR Part 174. FRA's Hazardous Materials Division (Hazmat) is monitoring NS' compliance efforts through routine oversight inspections.
Ensure that train crews have and maintain documentation to reflect the location of hazardous materials shipments within the train.	NS has rules and training in place to ensure proper consist management. NS development of electronic train consist documentation should further improve performance in this area.	
Ensure that hazardous materials shipments are properly segregated within a train in accordance with § 174.85, and that crews ensure segregation compliance is maintained within a train when making changes to the consist.	NS has rules and training in place to ensure proper consist management and hazardous materials segregation. NS also has checks built into TYES (Thoroughbred Yard Enterprise System) to assist with proper placement of cars.	
Ensure trains utilizing SP 20996 adhere to all specified operational conditions established in the SP.	NS has reinforced the requirements of SP 20996 with involved employees. NS has posted the SP 20996 waiver on Comply365, which is available on crews' mobile devices, as well as on our	NS continues to emphasize through training and management interaction its requirements to maintain compliance with the operational conditions established in SP-20996 for buffer car relief when utilizing unoccupied

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
	Operations Web Portal, which is available to all employees.	distributed power units (UDPUs). Hazmat is monitoring NS' SP-20996 compliance efforts through routine oversight inspections.
Ensure that train crews adhere to the requirements to maintain an accurate placement-in-train document per § 174.26 and SP 21110. If a train crew is utilizing both an electronic document and a paper document, both documents must be maintained to reflect accurate position-in-train information of hazardous materials shipments.	NS has rules and training in place to ensure proper position in train documentation. NS has reinforced the requirements of SP 21110 with involved employees. NS has posted the SP 21110 waiver on Comply365, which is available on the crews' mobile devices, as well as on our Operations Web Portal, which is available to all employees.	NS is emphasizing through training and management interaction its requirements to maintain compliance with the operational conditions established in SP-21110 for the use of electronic train placement documents on areas of NS' network that haven't been fully approved for use, or where train crews are not fully trained on the SP requirements. Hazmat is monitoring NS' SP-21110 compliance efforts through routine oversight inspections and. has seen improvement in those areas where both electronic and paper train placement documents are required to be maintained.

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
Motive Power & Equipment		
<p>Ensure effective and timely communication between the transportation department and the mechanical department of defective conditions identified by members of the transportation department.</p>	<p>NS has procedures in place to ensure communication and has enhanced those processes, as a result of the audit recommendation. The enhanced processes include changes to departmental reports to increase the visibility of and include equipment status updates from both departments.</p>	<p>Reports from NS managers indicate no formal process has been implemented since the audit. However, follow-up inspections show better communication between the transportation and mechanical departments. Both departments are using a Microsoft Teams channel to communicate reporting of defective conditions and the progress of inbound and outbound trains. FRA will continue to monitor the issue of communication between NS' transportation and mechanical departments.</p>

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
Operating Practices		
<p>Ensure railroad testing officers understand all requirements of the Operational Testing and Inspections program and maintain accurate records of qualifications.</p>	<p>NS has procedures in place to ensure railroad testing officers understand all requirements of the Operational Testing and Inspections program, and NS has reinforced these requirements with supervisors. NS has enhanced its recordkeeping by centralizing the database of qualified testing officers. The recently issued program changes have been reviewed with supervisors on department and division safety calls.</p>	<p>On June 30, 2023, FRA’s Associate Administrator for Safety disapproved NS’ 49 CFR Part 217 Program of Operational Tests and Inspections for noncompliance. NS provided a written response to FRA on July 17, 2023; FRA is currently reviewing this response.</p>
<p>Ensure and amend, where necessary, the Operational Testing and Inspections program to ensure compliance with all requirements of 49 CFR Part 217, including both the administration of the program, recordkeeping requirements, and the requirement that operational testing and inspections prioritize rules that prevent accidents.</p>	<p>As of August 2022, NS enhanced its recordkeeping for rules checks to allow for inputting and electronic tracking of informal handlings, including automated emails for documentation, to be consistent with the manner of documentation that already existed for formal handlings. NS is also implementing other process changes, such as recording operational tests and inspections for compliance into our rules database at the individual rule level instead of the rule category level, in accordance with FRA recommendations. NS issued a revised Program, effective</p>	

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
	<p>June 5, 2023, that addresses the 2022 NS System Audit findings. The Program contains various changes to the Program made with updates to the prior Program as well as revisions to supervisor testing requirements.</p>	
<p>Ensure that testing officers understand procedures for administering and recording tests.</p>	<p>NS has procedures in place to ensure railroad testing officers understand all requirements of the Operational Testing and Inspections program and is reinforcing and enforcing those requirements. Supervisors were required to provide a digital signature for their review of the June 5, 2023, Program, and an accompanying refresher training document. The Program changes have been reviewed with supervisors on department and division safety calls.</p>	

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
Safety Partnerships		
<p>Create and provide the required checklists together in one document (digital or hardcopy), for each new employee prior to beginning OJT exercises.</p>	<p>OJT checklists were available and have been provided in one single document for each new employee. NS has developed a new employee portal with this and other documentation to facilitate training. Task checklists (aka Standard Operating Practices and SOP's) were compiled and uploaded to the CT SharePoint site which is accessible on and off network from all devices. On the same site are a series of videos that demonstrate how to perform many of those tasks.</p>	<p>This recommendation was completed by NS in 2022. The NS training staff in McDonough, GA were extremely responsive to this issue. The issue was resolved within days of bringing this finding to their attention.</p>
<p>Conduct an annual review of safety data and performance metrics within 30 days of this report.</p>	<p>NS conducted a review of safety data and performance metrics and made appropriate modifications to the program within the first 30 days after the audit concluded. They will continue with annual reviews, and follow-up with any changes specifically from those reviews. NS used recent trends to shape our recurrent OJT classroom training for Conductor Trainees (routes and train inspection most recently).</p>	<p>This recommendation was completed by NS. NS completed its delinquent annual review and provided a copy of its 2022 review to FRA.</p>

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
<p>Review all active NS courses relating to federal laws, regulations, or orders and consider revisions based on data gathered from the annual review.</p>	<p>NS conducts periodic evaluations of its training program and adjusts as appropriate, including using data gathered from those ongoing reviews and feedback from the operating departments. An annual review was completed in 2022, and NS recently started the Transportation review for 2023, with the inclusion of Transportation and Safety stakeholders.</p>	<p>This recommendation was completed by NS in 2022. However, this task does require annual adjustments, if necessary.</p>
<p>Complete all ongoing revisions to the LMS to clearly document the qualification designation(s) of all occupational category and subcategory of NS employees.</p>	<p>The revisions to the NS Learning Management System (LMS) to incorporate qualification designations of occupational categories and subcategories were completed within 30 days after conclusion of the audit.</p>	<p>The recommendation was completed by NS. NS training staff in McDonough, GA, were very responsive when FRA identified this finding. FRA worked closely with NS to ensure the proper terms were used in its LMS, to clearly identify qualifications of each safety-related railroad employee.</p>

2022 NS System Audit Recommendations

2022 NS System Audit Recommendations		
FRA Recommendation	NS Response	Current Status
Signal & Train Control		
<p>Develop and implement a process for ensuring that changes to warning systems at Highway Rail Grade Crossings (HRGC) are recorded in applicable circuit plans in a timely fashion.</p>	<p>NS has enhanced its processes to incorporate additional checks and balances and to further incorporate technology to ensure compliance and quickly find non-compliance. NS put in place new processes and is currently enforcing quicker turnaround time on plan revisions from our Atlanta office to vendors. The goal for turnaround is 60 days, which is a significant improvement.</p>	<p>NS is currently in the testing phase of a new software program that will result in a quicker turnaround time. NS has a target implementation date for this new software program of August 1, 2023. Their goal for turnaround time, once the software is implemented, is 60 days. FRA will continue to monitor this issue until the new software program has been fully implemented.</p>

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
Track		
<p>Resubmit a revised CWR plan for FRA approval that:</p> <ul style="list-style-type: none"> • Includes proper reporting requirements for rail plug cut-ins that establishes control and proper monitoring by NS management for the proper adjustment of RNT in accordance with §§ 213.118 & 119. • Includes written procedures which address: the installation, adjustment, maintenance, and inspection of CWR; inspection of CWR joints; and an updated training program for the application of those procedures. • Retrain § 213.7(c) personnel who are qualified to inspect CWR or supervise the installation, adjustment, and maintenance of CWR track in the proper FRA reporting requirements for initial remedial action for rail record retention. • Clearly define initial remedial actions associated with field activities taken to replace, repair, or protect defective rails listed in accordance with the table of § 213.113(c). 	<p>NS believes that the revised CWR plan it submitted to FRA in 2021 meets applicable regulatory requirements and is more robust than the approved plan it has had in place since 2010. NS has met with the FRA track safety staff and is working toward resolution on a mutually agreeable CWR plan.</p>	<p>NS did submit a draft CWR plan, which FRA did not accept. FRA sent the plan back to NS for revision on July 12, 2023. NS is currently working on correcting and updating its CWR plan. FRA expects to receive a response by August 12, 2023.</p>

2022 NS System Audit Recommendations

FRA Recommendation	NS Response	Current Status
<p>Develop and implement an approach to address defects in turnout areas that:</p> <ul style="list-style-type: none"> • Improves oversight of track inspection reporting in critical component areas of turnouts. • Improves support for follow-up maintenance activities once component issues are identified with a focus on quality repairs. • Addresses severely deficient frog conditions. 	<p>NS has processes and rules in place to address defects in turnout areas that are in compliance with applicable rules. In fact, in many higher risk areas such as high-use turnout areas, NS has higher standards for walking inspections and follow-up maintenance than the regulations require.</p>	<p>NS has not agreed to implement this recommendation because they state they have been in compliance with the minimum FRA requirements.</p>
<p>Increase periodic walking inspections in main tracks at joints at ends of curves and CWR rail cut-ins.</p>	<p>NS conducts walking inspections in main tracks at joints at ends of curves and CWR rail cut-ins consistent with applicable rules. In fact, in many areas, NS has higher standards for walking inspections and follow-up maintenance than the regulations require.</p>	<p>NS has not agreed to implement these recommendations because they state they have been in compliance with the minimum FRA requirements.</p>
<p>Increase periodic walking inspections in yards for improved joint bar defect identification.</p>	<p>NS conducts walking inspections in yards for joint bar defect identification consistent with applicable rules. In fact, in many areas, NS has higher standards for walking inspections and follow-up maintenance than the regulations require.</p>	

APPENDIX B: FRA SAFETY ADVISORIES, NS RESPONSES, AND FRA FOLLOW-UP

Safety Advisory 2022-01: Use of Portable Derails

FRA published Safety Advisory 2022-01 on October 28, 2022, to emphasize the importance of 1) ensuring that portable derails are clearly visible to traincrews and operators of other on-track equipment, and 2) having processes in place to ensure portable derails are removed when not necessary for on-track safety. This safety advisory recommended that railroads and railroad contractors review and revise their on-track safety manuals, as necessary, to ensure they include procedures and rules for the use of portable derails. A summary of the recommendations, and NS' responses to those recommendations, are below.

Recommendations & Responses

Recommendation 1.

Review with their employees the circumstances of the fatal accident described in this Safety Advisory.

Response to Recommendation 1:

NS issued a systemwide operations bulletin (OB-13) on Nov. 13, 2022, that reviewed both the incident and the use of portable derails on non-controlled track, to render the track inaccessible for roadway worker protection.

Recommendation 2.

Review and revise, as necessary, their on-track safety manuals to ensure the use of portable derails is adequately addressed and, at a minimum, that these manuals:

- a. Provide that portable derails be equipped with a functioning light or a reflectorized flag when used at night or under other conditions of limited visibility; and
- b. Include procedures to ensure that portable derails are removed when no longer necessary, such as procedures to track the location and use of portable derails.

Response to Recommendation 2:

Engineering Department (primary users of portable derails) actions:

- *Issued a focused communication on subject matter*
- *Updated Yard Permission form to provide a location to note your placement of portable derails*

C&S²⁵ Actions

- *ATC reviewed and updated standards and procedures.*
- *C&S revised Standards & Procedures 1810 which covers Roadway Worker Protection*
- *Requirements mimicking Engineering standards for derail color, placement, notification, and tracking, as well as use of cones were added.*

Mechanical Department Actions

- *Mechanical, while already well covered by Blue Signal Rules (NS OR 213, OR 660(b) and (c)), did take this as an opportunity to clarify that derails for Mechanical use should be painted blue. This helps clearly identify them and differentiate them from RWP use. Mechanical Department Instruction MDI-0035 was issued.*

FRA Follow-up:

FRA is monitoring NS' measures and their effectiveness in addressing FRA's recommendations.

Safety Advisory 2022-02: Addressing Unintended Train Brake Release

FRA published SA 2022-02 on December 29, 2022, to make the rail industry aware of an issue encountered by a train crew that had an unintended brake release of a train's automatic air brakes while stopped at a signal, and to recommend steps to address that issue. Recommendations and NS' responses are summarized below.

²⁵ C&S is NS' term for the discipline which in this report is called Signal & Train Control.

Recommendations & Responses

Recommendation 1.

Train crews should not expect a service rate or emergency brake application to indefinitely maintain application of a train's air brakes.

Recommendation 2.

If a train is stopped with air brakes set, and the train begins moving, the crew should immediately apply the emergency brake. After the train is stopped, the crew should set a sufficient number of handbrakes, to secure the train from further unintended movement before releasing the brakes and recharging the train's air brake system.

Recommendation 3.

Each railroad should adopt and implement an air brake procedure consistent with Recommendations 1 and 2 that addresses unintended brake releases.

Response to Recommendations 1, 2, and 3:

NS issued Operations Division Bulletin (ODB) #1 on February 10, 2023, that revised, among other rules, NS-1 rule L-245, Use of Train Air Brake. This was revised to add paragraph (h), to prescribe requirements that if an unintentional brake release occurs while the automatic brakes are applied, an additional brake pipe reduction of at least five pounds per square inch (PSI) must be made beyond the last effective brake pipe reduction. If not effective, the train's brakes must be placed in emergency. Additionally, NS-1 rule L-245 paragraph (g) addresses our instructions when train air brakes are required to safely control movement. Any unintentional brake release must be reported immediately to the Chief Dispatcher. We began reviewing L-245 for revision following the incident described in the safety advisory since it occurred on NS. We benchmarked other railroads for unintentional release of brakes, and had communications with FRA about the rule change.

Recommendation 4.

Each railroad should have an operating supervisor conduct a face-to-face meeting with each locomotive engineer and conductor to explain and reinforce the contents of this advisory.

Response to Recommendations 1, 2, and 4:

System Operations Bulletins require employees to read/acknowledge rule changes. The Road Foreman of Engines (RFE) e-Blast was provided as an additional resource to clarify and support the rule changes.

FRA Follow-up:

FRA is monitoring NS' measures and their effectiveness in addressing FRA's recommendations.

Safety Advisory 2023-01 & Safety Advisory 2023-01.02: Evaluation of Policies and Procedures Relating to the Use and Maintenance of Hot Bearing Wayside Detectors

On March 3, 2023, after several accidents in which burnt journal bearings were likely causal or contributing factors, FRA published SA 2023-01 to make recommendations to enhance the mechanical reliability of rolling stock and the safety of railroad operations. This SA contained four recommendations for evaluation, analysis, inspection of hot bearing detectors (HBD), as well as training and qualification of certain personnel. FRA published a supplement to this SA June 14, 2023, adding a recommendation that railroads evaluate the resiliency and accuracy of the overall process used to monitor and measure bearing health. The recommendations and NS responses are summarized below.

Recommendations & Responses

Recommendation 1.

Review existing HBD system inspection and maintenance policies and procedures for compliance with existing industry standards and manufacturer recommendations for HBDs.

Response to Recommendation 1:

Internal inspection and maintenance policies and procedures reviewed. Revisions made to Test & Maintenance Instructions Section 404 - Hot Bearing/Wheel Temperature Detector Systems.

Recommendation 2.

Review existing procedures to train and qualify personnel responsible for installing, inspecting, and maintaining HBDs to ensure they have the appropriate knowledge and skills. Railroads should also develop and implement appropriate training on the inspection and maintenance requirements for HBDs and provide that training at appropriate intervals, to ensure the required knowledge and skills of the inspection maintenance personnel. Further, railroads should evaluate their training content and training frequency, to ensure any employee who may be called upon to evaluate a suspect bearing has the necessary training, experience, and qualifications. FRA also encourages railroads to ensure these individuals are available at all hours of operations across the railroad's network.

Response to Recommendation 2:

- a. All maintainers were assigned and completed training on the inspection and maintenance requirements for HBDs.*
- b. Additional training enhancements are currently in development that include a new instructional video to ensure standards are fully understood using visual representation.*

Recommendation 3.

Review current HBD detector thresholds in light of recent derailments, and all other relevant available data (including data from any close calls or near misses), to determine the adequacy of the railroad's current thresholds. Thresholds should be established for single measurement, as well as multiple measurements of individual bearings to enable temperature trend analysis.

Response to Recommendation 3:

- a. *NS worked in collaboration with industry partners as part of the Equipment Health Monitoring Committee (EHMC) to align on AAR Rule 36, specifically the critical alarm threshold, which was reduced from 200 degrees, down to 170 degrees.*
- b. *EHMC continued collaboration on the creation of industry visible trending roller bearing rule that will have unified response by all Class 1 railroads and be restricted at interchange.*
- c. *NS internal investigations into HBD trending analysis are being performed to expand predictive analytics capabilities.*

Recommendation 4.

Review current procedures governing actions responding to HBD alerts to ensure required actions are commensurate with the risk of the operations involved. With regard to trains transporting any quantity of hazardous material, FRA recommends railroads adopt the procedure outlined in AAR's (Association of American Railroads) OT-55 (Operating Transportation Circular) for key trains and initial measurements.

Response to Recommendation 4:

- a. *Alignment of train crew inspection devices implemented at the industry level as well as training materials distributed internally regarding best inspection practices.*
- b. *Internal review of thermal handheld devices for train crews to enhance the decision-making process using observed temperature readings.*
- c. *Internal review of OT -55 for key trains.*

Recommendation 5.

Rigorously evaluate the resiliency and accuracy of the overall process used to monitor and act upon information from wayside detectors, with specific focus on steps and tasks that, if not performed or performed incorrectly, could mislead decision makers. The process of monitoring, reporting, inspecting, analyzing, and acting on information from detectors includes tasks that, if incorrectly executed, could introduce risk. Railroads should also evaluate each step and task performed by railroad personnel to pinpoint any HBD reporting failures and implementing appropriate safeguards to minimize the impact of those failures when monitoring, analyzing, and responding to detector information.

Response to Recommendation 5:

- a. *Staffing levels at the Wayside Detector Help Desk were increased from a single person per shift to two.*
- b. *Automated Wayside alert notifications to train crews and dispatchers to increase awareness to all stakeholders is currently in development for 2023.*
- c. *Wayside Help Desk monitors no cause found (NCF) inspection results and opens detector trouble tickets as needed.*
- d. *Wayside alert, Standard Operating Procedures (SOP) are continually revised as processes are changed or enhanced to provide better coverage and understanding.*

FRA Follow-up:

FRA is monitoring NS' measures and their effectiveness in addressing FRA's recommendations.

Safety Advisory 2023-02: Train Makeup and Operational Safety Concerns

Recommendations & Responses

Recommendation 1.

Review and update train makeup policies, procedures, and guidelines to ensure they are comprehensive, effective, and current.

Response to Recommendation 1:

Initiated a complete review of our train handling guidelines and developed a set of train makeup rules focused on weight distribution and the mitigation of in-train forces. Additionally, hired two independent firms to review those changes and provide comprehensive review, feedback, and

recommendations of NS train marshalling instructions. We took these actions prior to the issuance of the safety advisory since the subject incident occurred on NS.

Recommendation 2.

Ensure that all personnel involved in train makeup decisions and operations receive appropriate training, guidance, and supervision to effectively execute train makeup policies, procedures, and guidelines to ensure safe operations.

Response to Recommendation 2:

Provided training to those making train make up decisions in the form of instructor led training, job aids and video education. T&E employees as well as managers have been provided with four separate training videos on train makeup. Twenty-four-hour assistance has been provided by CRFE desk. Ongoing development and delivery of training will continue with more specific training targeted at train handling. Development of automated system (Train Marshalling Container) to encompass all train marshalling rules for interaction of other applications within NS.

Recommendation 3.

Establish a system to regularly monitor and assess train makeup practices, with a focus on identifying and addressing potential safety risks.

Response to Recommendation 3:

Independent firm is building an automated system (Train Marshalling Container) to house and manage train marshalling rules for all NS applications; Thoroughbred Yard Enterprise System (TYES), an inventory management system, Train Build Optimizer (TBO), and Mobile Train Reporting (MTR) used by train service employees to record in real time car moves and placement to interact with.

Recommendation 4.

Encourage open communication and collaboration among all stakeholders, including train crews, dispatchers, yardmasters, and maintenance personnel, to ensure a comprehensive understanding of train makeup factors and their potential impact on safety. Personnel should be encouraged and empowered to adhere to train makeup policies, procedures, and guidelines, even if it delays a train.

Response to Recommendation 4:

Effort began with training of all employees on basics of train build, and train handling (in-train forces) fundamentals, to ensure employees have necessary knowledge to engage in collaborative communication. Compliance with issued instructions is required. Trains found not in compliance have operational restrictions until corrected. All employees are not only encouraged, but they are also required to ensure compliance with these policies, procedures, and guidelines.

Recommendation 5.

Develop and implement strategies to mitigate the risks associated with train build factors, such as the proper use of distributed power, train length limitations, and other operational train handling practices.

Response to Recommendation 5:

See answer 1 above.

Recommendation 6.

Enhance incident investigation procedures to specifically address train makeup factors and their potential contribution to the cause of the incident.

Response to Recommendation 6:

Norfolk Southern currently uses Train Operation & Energy Simulator (TOES™), Vampire®, and other simulation software suites to investigate train makeup factors. Additionally, NS Safety Department now leads major accident and injury investigations, which includes a thorough fact-finding mission, followed by root-cause analysis, and ultimately identification and implementation

of corrective actions. Additionally, NS has brought in an independent contractor to perform incident investigation training.

FRA Follow-up:

FRA is monitoring NS' measures and their effectiveness in addressing FRA's recommendations.

Safety Advisory 2023-03: Accident Mitigation and Train Length

On May 2, 2023, FRA published SA 2023-03 to ensure that railroads and railroad employees are aware of the potential complexities associated with operating longer trains, and to ensure they take appropriate measures to address those complexities, in order to safely operate such trains. The recommendations made in this SA and NS' responses are summarized below.

Recommendations & Responses

Recommendation 1.

Review ABTH (Air Brake and Train Handling) rules, or supplements, to ensure those rules adequately address the complexities associated with the railroad's operation of longer trains.

Response to Recommendation 1:

Initiated a complete review of our train handling guidelines and implemented changes designed to require the use of DP for trains based on train type, tonnage, footage, and car characteristics (EOCC). Developed a set of train makeup rules focused on weight distribution and the mitigation of in-train forces. Additionally, hired two independent firms to review those changes and provide comprehensive review, feedback, and recommendations of NS train marshalling instructions.

Recommendation 2.

Implement technologies, policies, procedures, and/or any necessary hardware enhancements to ensure two-way EOT (end-of-train) devices maintain uninterrupted communications to and from the headend and rear-end units. Develop, implement, and maintain clear policies, procedures, and rules that address instances of the loss of communications between EOT devices.

Response to Recommendation 2:

NS currently has operations rules in place to address EOT communication loss. NS is investing in technology, which includes EOT repeater functionality to reduce instances of communication loss.

Recommendation 3.

Adopt enhanced technologies and/or procedures for maintaining radio voice communications with a contingency plan if voice communications are lost between operating employees.

Response to Recommendation 3:

NS has evaluated a higher gain antenna for use on the handheld radios. NS has collaborated with vendors to begin production and procurement of enhanced radios. Additionally, NS has invested in repeater technology in areas where communication is challenged.

Recommendation 4.

Identify changes to crew training, train handling procedures, train makeup, DPU requirements, limitations to length or tonnage, speed restrictions, track, mechanical, and brake inspection and maintenance requirements necessary to ensure safe operations of longer trains.

Response to Recommendation 4:

Initiated a complete review of our train handling guidelines and implemented changes designed to require the use of DP for trains based on train type, tonnage, footage, and car characteristics (EOCC). Regarding training, NS engineers have all received training on the handling of distributed power trains at lengths consistent with NS operating practices. NS engineers are

monitored and coached on actual train operations through the 24/7 CRFE desk. CRFE provides real-time feedback to locomotive engineers on train handling situations. Automated alerts are used to monitor engineer performance and compliance with train handling instructions. Coaching and feedback are provided, as necessary.

Recommendation 5.

Review, and update as necessary, each railroad's current 49 CFR Part 240 locomotive engineer certification program, to ensure the program addresses all levels of operations, including the operation of longer trains.

Response to Recommendation 5:

NS provides training on the handling of trains at lengths consistent with NS operating practices.

Recommendation 6.

Review and evaluate existing operational testing data as required by 49 CFR Part 217.9(e), relevant to the operation of longer trains. If longer train operations are conducted, or if any potential training or compliance issues are identified, consider increasing the frequency of operational testing and/or modifying the types of operational testing performed to address those deficiencies.

Response to Recommendation 6:

At this point, NS rules and special instructions were recently issued to prescribe new train marshalling rules that address all trains, especially longer trains. The current level of oversight for building trains as prescribed by rules and instructions, as well as the system level review and approval of consists before a train departs, provides mitigation for rule violations. From a train handling perspective, the rules for how an engineer operates/handles their train do not differ based on train length. We monitor for compliance on all train types and lengths, generally and our existing tests for compliance have not been revised to account for longer trains at this time. We will continue to monitor operations to determine if changes are needed to operational testing relevant to longer trains.

Recommendation 7.

Identify geographic areas that could be impacted by longer trains at highway-rail grade crossings, take action to minimize blocked crossings by considering train length when taking any action that causes any part of a train to occupy a crossing, and work with local communities and emergency responders to prevent or at least mitigate the impacts of blocked crossings should they occur.

Response to Recommendation 7:

The NOC maintains a list of geographic areas in which crossing and the distance between crossings is identified to use for train meets or staging trains. These are referenced and used by the dispatchers to determine train meets, when locations have been identified as high priority areas. When locations have been identified as high priority, bulletins and instructions are issued to dispatchers and train crews to avoid blocking these crossings to the greatest extent possible.

FRA Follow-up:

FRA is monitoring the NS' measures and their effectiveness in addressing FRA's recommendations.

Recommendation 8.

Conduct post-accident simulator evaluations and assign accurate primary and contributing cause codes for reportable and accountable accidents and incidents. A detailed narrative is basic to an understanding of the factors leading to, and the consequences arising from, an accident.

Response to Recommendation 8:

NS currently uses TOES™, VAMPIRE®, and other simulation suites to investigate train makeup factors. Additionally, NS Safety Department now leads major accident and injury investigations, which includes a thorough fact-finding mission, followed by root-cause analysis, and ultimately identification and implementation of corrective actions. Additionally, NS has brought in an independent contractor to perform incident investigation training.

FRA Follow-up:

FRA will continue to monitor reportable accident reports submitted by NS on a monthly basis. Report narratives will be reviewed and compared to reported cause codes for accuracy. Issues and discrepancies will be brought to the attention of NS for revision.

APPENDIX C: LETTERS FROM FRA TO NS AND TO THE RAIL INDUSTRY AT LARGE

October 28, 2021, Letter to NS:



U. S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

October 28, 2021

Mr. James Squires
Chief Executive Officer
Norfolk Southern Railway Company
3 Commercial Place
Norfolk, VA 23510

Dear Mr. Squires:

I am writing you this letter due to the two recent employee injuries that the Norfolk Southern Railway Company (NS) had on October 20 and 26, 2021. In both of those incidents, your employees, who were certified conductors with less than a year of service, were struck by moving railroad equipment and suffered serious injuries. As I am sure you would agree, having two such serious injuries occur in such a short time raises serious concern. NS has had five conductors/brakemen suffer amputations and crushing injuries in the past seven (7) months.

In response to these injuries, the Federal Railroad Administration (FRA) expects NS to take appropriate action to mitigate the likelihood of such injuries occurring in the future. FRA expects that the root causes of these injuries will be discussed broadly across your railroad to raise awareness of the contributing factors that led to the injuries. FRA also expects NS to incorporate any lessons-learned regarding the causations of these injuries into your conductor training program and into any other training program for your employees who are exposed to similar hazards. Further, FRA expects NS to evaluate its conductor training program, in line with our letter of September 9, 2021, which identified significant deficiencies in NS' May 22, 2018, conductor certification program, to ensure that it is sufficient to prepare and protect individuals in performing duties as a certified conductor. Particularly, NS should consider any potential relationship between recent changes to the duration of its conductor training, and the frequency and severity of conductor incidents and injuries. NS' revised conductor certification program is due November 12, 2021.

Should you have any questions regarding this letter, please contact Mr. Karl Alexy, Associate Administrator for Safety and Chief Safety Officer at john.alexey@dot.gov or (202) 493-6282. A copy of this letter has been provided to the president of each major labor organization that represents NS employees.

Sincerely,

A handwritten signature in blue ink, appearing to read "Amit Bose".

Amit Bose
Deputy Administrator

cc:

Mr. Jeremy Ferguson, President, SMART-Transportation Division
Mr. Dennis Pierce, President, BLET

NS Response:

NS conducts periodic evaluations of its training program and adjusts as appropriate, including using data gathered from those ongoing reviews and feedback from the operating departments. An annual review was completed in 2022, and NS recently started the Transportation review for 2023, with the inclusion of Transportation and Safety stakeholders.”

FRA Follow-up:

FRA is conducting investigations into both injuries.

March 28, 2022, Letter to Industry (NS Copy):



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

March 28, 2022

Mr. James A. Squires
President & Chief Executive Officer
Norfolk Southern Railway
Three Commercial Place
Norfolk, VA 23510

Re: Hours of Service and Fatigue Implications from Railroad Attendance Policies

Dear Mr. Squires:

America's railroads and their employees play a vital role in the supply chain and the overall economic strength of the United States. A safe and efficient rail operation relies on many factors, including well-maintained equipment and infrastructure, through both human interaction and the use of new technology. Over the last two years, the freight and passenger rail industry has overcome external challenges posed by the COVID-19 pandemic, global supply chain disruptions, and the recent increase in fuel prices. Railroad employees worked tirelessly during the COVID-19 pandemic, moving freight and passengers to keep our economy strong, and to overcome the supply chain disruptions in all modes of transportation. Over the past five years (Jan 2017 – Jan 2022), Class I railroad employment has fallen from 148,427 to 111,754, a reduction of about 25 percent. This reduction in employee numbers can be attributed to many factors: increased use of technology, effects of the COVID-19 pandemic, and the implementation of Precision Scheduled Railroading, which focuses on scheduling, equipment utilization, and minimizing costs to improve earnings and operating ratio.

All industries, and especially railroads, are faced with staffing shortages, and issues with ensuring employees reliably show up for work at the scheduled location and time. Compounding this challenge, railroad schedules and "line-ups" can change unexpectedly due to weather, service interruptions, increases or decreases in traffic volumes, and employee availability. For decades, railroads have developed various attendance policies designed to ensure employee accountability to operate trains on time. Balancing employee attendance, ensuring compliance with Federal Hours of Service (HOS) laws and regulations, and preventing fatigue should all be part of a well-reasoned and scientifically-validated attendance policy. FRA recently distributed a fatigue survey we hope will provide valuable information concerning fatigue and work-rest cycles. FRA is also finalizing a rule on the management of fatigue risk.

As you know, FRA enforces the Federal HOS laws under 49 U.S.C. chapter 211. These statutory requirements include maximum time on duty, minimum periods of undisturbed rest, and cumulative limitations for freight transportation employees regarding consecutive on-duty days and maximum hours in a calendar month. FRA takes seriously all HOS violations, and FRA closely monitors railroad compliance with the statutory requirements, taking enforcement action as appropriate.

Recognizing that fatigue is a longstanding concern as a contributing cause to human factor accidents in the railroad industry, we are reviewing railroad attendance policies, each policy's compliance with Federal law and regulations, and the potential impacts of these policies on rail safety and employee fatigue. Given my concerns over the potential for attendance policies to have a negative effect on employee rest, and thus safe railroad operations, I have directed FRA to study the impacts of a recent freight railroad practice of holding employees off-duty at an Away From Home Terminal (AFHT) for more than 24 hours. This off-duty period generates a break in consecutive days initiating an on-duty period.

FRA is investigating whether freight railroads are intentionally resetting consecutive on duty periods at AFHT to prevent freight transportation employees from initiating on-duty periods on six or seven consecutive days, which would trigger a requirement under the HOS laws, for extended rest at the employee's home terminal. FRA is reviewing work histories of freight transportation employees working in pool turn service for the months of January and February of this year. The goal of the study is to understand the prevalence of restarting an individuals' consecutive on duty periods, at AFHT. FRA will use these work histories to evaluate the potential for crew member fatigue as a result of these practices. FRA investigates railroad accidents and injuries to determine root causes and make recommendations to prevent further occurrences. For accidents suspected of being human factor caused, FRA routinely performs fatigue analyses using tools such as the Fatigue Audit InterDyne (FAID) program. The FAID program is an analytical tool, used to identify, quantify, and predict the likelihood of fatigue exposure associated with different work hours. In addition to this type of scientific analysis, during FRA's future accident and incident investigations, FRA will collect and analyze information related to the involved railroads' attendance policies and train lineup procedures as applied to the involved railroad employees.

Using all the information detailed above, FRA will partner with railroad leadership and labor to discuss the means to identify potential methods of addressing fatigue in the railroad industry.

Sincerely,



Amit Bose
Administrator

cc:

Mr. Ian Jeffries, President & Chief Executive Officer, Association of American Railroads

NS Response:

No response required from railroads.

FRA Follow-up:

FRA's Operating Practices (OP) Hours-of-Service (HOS) team has been focused on AFHT handling of covered service employees during audits of Class 1 railroads. FRA has not seen any patterns substantiating railroads have been holding crews for 24-hours at AFHT to reset the individuals consecutive on duty periods. The OP HOS subject matter expert (SME) has worked to ensure any delays in lodging have been properly annotated, and covered service employees rest times have been properly amended. The OP HOS team is engaged with labor concerning NS' practice of AFHT crews reporting on their rest and monitoring for any allegations of holding employees off-duty at an AFHT for more than 24-hours.

June 10, 2022, Letter to Industry:



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

June 10, 2022

Dear Fellow Rail Safety Stakeholders:

As previously outlined in my letter dated March 28, 2022, to the Association of American Railroads (AAR) and its member railroads, the Federal Railroad Administration (FRA) is concerned with the industry practice of having rail transportation employees spend extended periods of time at away-from-home-terminal (AFHT) locations. An FRA study found that surveyed employees reported sleep at a AFHT is shorter and of worse quality than home sleep,¹ which may increase fatigue. FRA recognizes that fatigue of railroad employees is a longstanding concern and challenge for the railroad industry.

When rail transportation employees are required to stay at AFHT lodging for extended periods, environmental factors (such as loud ambient noise due to other guests or lodging staff) create challenges for obtaining quality rest. Further, the variability of train lineups at AFHT locations can cause longer than normal stays at AFHT lodging, potentially further exacerbating the level of fatigue.

FRA looks forward to partnering with railroad and rail labor leadership at the upcoming meeting of the Railroad Safety Advisory Committee (RSAC) to discuss and identify potential ways of addressing fatigue in the railroad industry. The proposed RSAC task statement seeks to engage rail industry leaders to design and conduct one or more pilot programs to analyze practices that could reduce fatigue and maximize alertness for train and engine crews and other railroad employees.

I urge railroads to consider the potential for increasing fatigue when employees have extended stays at AFHT locations. I look forward to AAR's and its member railroads' support and participation in the proposed RSAC task.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Amit Bose'.

Amit Bose
Administrator

¹ Gertler, J., & DiFiore, A. (2009). *Work schedules and sleep patterns of railroad train and engine service workers* (DOT/FRA/ORD-09/22). Federal Railroad Administration. <https://railroads.dot.gov/elibrary/work-schedules-and-sleep-patterns-railroad-train-and-engine-service-workers>

NS Response:

No response required from railroads, asks for RSAC discussion.

FRA Follow-up:

FRA's OP HOS team has been focused on AFHT handling of covered service employees during audits of Class 1 railroads. FRA has not seen any patterns substantiating railroads have been holding crews for 24-hours at AFHT to reset the individuals consecutive on duty periods. The OP HOS SME has worked to ensure any delays in lodging have been properly annotated and covered service employees rest times have been properly amended. The OP HOS team is engaged with labor concerning NS' practice of AFHT crews reporting on their rest and monitoring for any allegations of holding employees off-duty at an AFHT for more than 24 hours.

September 26, 2022, Letter to Industry (NS Copy):



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

September 26, 2022

Mr. Alan Shaw
President & Chief Executive Officer
Norfolk Southern Railway
Three Commercial Place
Norfolk, VA 23510

Dear Mr. Shaw:

The Federal Railroad Administration (FRA) sees evidence that railroads are curtailing mechanical and brake safety inspections by maintenance-of-equipment personnel, specifically carmen, while increasing reliance on inspections by railroad workers from other crafts (e.g., train and yard crews). Although, under certain circumstances, FRA's regulations allow for train and yard crews to be assigned to complete tasks customarily handled by maintenance-of-equipment personnel,¹ a central premise of the inspection requirements in FRA's Motive Power & Equipment regulations is to ensure rail equipment periodically undergoes comprehensive inspection by individuals specially trained in the maintenance and repair of the equipment (i.e., maintenance-of-equipment personnel), who can properly determine whether the equipment is safe to operate.

In particular, FRA is concerned that railroads have instituted certain practices that are inconsistent with the intent of FRA's freight car and brake system safety standards (49 CFR Parts 215 and 232). For example, FRA is aware that railroads may be intentionally holding trains outside of yards to have operating crews perform required mechanical inspections when maintenance-of-equipment employees are otherwise assigned to do so at yard locations. FRA is also aware of trains being held in "lost" or "ghost" tracks, where trains are physically on tracks within a yard, but not recorded in terminal data systems. Trains held on these "lost" or "ghost" tracks are treated essentially the same as trains held outside of a yard, because they are inspected by other than maintenance-of-equipment personnel stationed within the yard. In the event maintenance-of-equipment employees do inspect the equipment, as the equipment is not properly recorded as being in the yard, they may not have access to relevant electronic safety data and tracking information, which can result in non-compliant equipment continuing beyond the location designated for mechanical inspection or repair. Moreover, the use of train crews to conduct inspections even when qualified maintenance-of-equipment personnel are available in a yard may violate FRA rules concerning the qualifications for performing required mechanical tests and

¹ FRA's Technical Bulletin MP&E 21-02, dated August 20, 2021, identified several concerns about using workers from other crafts, who generally perform work not subject to blue signal protection (BSP), to complete tasks customarily handled by maintenance-of-equipment employees, specifically carmen, who perform work subject to BSP. Technical Bulletin MP&E 21-02 is available at <https://railroads.dot.gov/e-library/technical-bulletin-mpe-21-02-failure-comply-blue-signal-protections-title-49-code-federal>.

inspections, notably the Class I brake test and inspection requirements (see 49 CFR 232.205(d)), and may add to the fatigue experienced by the train crews, by adding the burden of completing the trains' mechanical inspections, given crew shortages and longer hours, subject to the hours-of-service limits.

Further, yarding trains allow mechanical teams, when given appropriate time to inspect trains, to identify alerts and warnings, and shop cars for inspection or repair due to previous identification by UMLER data, wayside detector input, or other means.

FRA understands that the size of receiving yards can constrain the ability to yard trains for required inspections, but it should not be used to minimize proper train maintenance and inspection or manage terminal dwell data.

The repeated performance of inspections, by employees or contractors who do not possess the same specialized training and experience as maintenance-of-equipment employees, raises concerns about the adequacy of the inspections and the potential impact on the safety of the equipment across the national rail network. FRA Motive Power & Equipment Inspectors will, therefore, redouble their focus on compliance with mechanical safety requirements, review mechanical inspection records, and pursue enforcement action as necessary.

Accordingly, I ask for your cooperation in ensuring that rail equipment receives proper attention from maintenance-of-equipment employees to perform mechanical inspections. This will not only help promote the safety of the equipment, but also the safety of those employees who maintain and operate it—for the benefit of all who depend on the safety and reliability of the national rail network. An identical letter has been sent to each of the Class I Railroads.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Amit Bose', with a stylized flourish at the end.

Amit Bose
Administrator

NS Response:

No response required from railroads. However, in a letter dated November 11, 2022, NS stated they have long standing processes and rules in place for mechanical and brake safety inspections that comply with applicable federal rules, and they employ the appropriate personnel to conduct those inspections. They indicated that in this manner, they ensure that rail equipment receives proper attention and mechanical inspections are conducted appropriately.

FRA Follow-up:

In recent inspections of NS, FRA has not identified incidents of trains being held out of the yard or on ghost tracks for inspection by NS personnel. However, FRA has identified a related practice in District 3 that was intended to address the issue in the letter dated September 26, 2022. This practice is block swapping and NS' execution does not appear to be in compliance with the regulations. In fact, since the September 26th letter FRA has found several instances in which FRA is considering violations. FRA will continue to closely monitor this issue.

January 5, 2023, Letter to Industry:



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

January 5, 2023

Ms. Katie Farmer
President & Chief Executive Officer
BNSF Railway
2650 Lou Menk Drive
Fort Worth, TX 76131

Ms. Tracy Robinson
President & Chief Executive Officer
Canadian National Railway
935 de La Gauchetiere Street
West Montreal, Quebec H3B 2M9

Mr. Keith Creel
President & Chief Executive Officer
Canadian Pacific Railway
7550 Ogden Dale Road SE
Calgary, AB T2C 4X9

Mr. Ian Jefferies
President & Chief Executive Officer
425 Third Street SW, Suite 1000
Washington, DC 20024

Mr. Joseph Hinrichs
President & Chief Executive Officer
CSX Transportation, Inc.
500 Water Street
Jacksonville, FL 32202

Mr. Patrick Ottensmeyer
President & Chief Executive Officer
Kansas City Southern Railway
427 West 12th Street
Kansas City, MO 64105

Mr. Alan Shaw
President & Chief Executive Officer
Norfolk Southern Railway
650 West Peachtree Street NW
Atlanta, GA 30308

Mr. Lance M. Fritz
Chairman, President, & Chief Executive Officer
Union Pacific Railroad
1400 Douglas Street
Omaha, NE 68179

Dear Mses. Farmer and Robinson, and Messrs. Jefferies, Creel, Hinrich, Ottensmeyer, Shaw, and Fritz:

The Bipartisan Infrastructure Law requires the Federal Railroad Administration (FRA) to initiate audits of the training, qualification, and certification programs of locomotive engineers and conductors, as required by 49 CFR Parts 240 and 242. These audits will include a focus on determining whether such programs provide locomotive engineers and conductors the knowledge, skill, and ability to discharge their responsibilities safely—a cornerstone for the safety of rail operations.

Over the last year and a half, FRA has reviewed several programs submitted by railroads. FRA has taken a collaborative approach to these program reviews, providing specific, detailed comments regarding compliance with the regulation. Some programs have been reviewed by

FRA several times, and in some cases, the revisions to a program barely made incremental progress toward correcting the deficiencies that FRA took great care detailing in successive letters to the railroad.

To encourage full compliance, please be advised that FRA is committed to pursuing enforcement action if a railroad's resubmitted certification program continues to fail to address the deficiencies identified by FRA. Accordingly, whenever FRA conducts its audit of your railroad, FRA will take into account those opportunities FRA has already provided your railroad to correct or address previously identified deficiencies.

I want to remind industry that the quality and adequacy of these certification programs are fundamental to ensuring that your operating crews are properly trained to safely perform their assigned duties. This starts with certification programs that clearly meet the minimum training and qualification standards.

Should you have any questions, please contact Mr. Christian B. Holt, Staff Director, Operating Practices Division, at Christian.Holt@dot.gov or 202-366-0978. In addition, a copy of this letter is being sent to the president of each labor organization representing your affected employees.

Sincerely,



Amit Bose
Administrator

cc:

Mr. Jeremy Ferguson, President, SMART-Transportation Division

Mr. Eddie Hall, National President, BLET

NS Response:

No response required from railroads.

FRA Follow-up:

On June 14, 2023, FRA sent NS a follow-up letter informing NS that it must take immediate action to address grave deficiencies in its conductor certification program.

NS replied in a letter dated June 19, 2023. NS stated it takes this issue seriously and will partner with FRA to achieve safety. NS also indicated it has contracted with Atkins Nuclear Solutions to work on improving its safety culture and evaluating its training program.

March 3, 2023, Letter to NS Alan Shaw:



U.S. Department of Transportation
Federal Railroad Administration



U.S. Department of Labor
Occupational Safety and Health Administration

March 3, 2023

Mr. Alan H. Shaw
President and Chief Executive Officer
Norfolk Southern Railway
650 W. Peachtree Street, NE
Atlanta, GA 30308

Dear Mr. Shaw:

The U.S. Department of Transportation (Department) and the Occupational Safety and Health Administration (OSHA) were recently contacted by representatives of Norfolk Southern (NS) employees regarding the safety of clean-up practices near the NS remediation site in East Palestine, Ohio. According to the letter dated March 1, 2023, addressed to Secretary of Transportation Pete Buttigieg from the American Rail System Federation, approximately 40 workers state that they were not provided adequate personal protective equipment (PPE) appropriate for the clean-up tasks they were assigned, and the union is concerned about the workers' safety and well-being. We understand this letter was also sent to Governor DeWine and East Palestine Mayor Conaway.

The Department, FRA, and OSHA are coordinating with their interagency partners to address this evolving situation and are prepared to take actions where employers are not protecting clean-up workers as required by applicable Federal law. In particular, OSHA covers workers who are working night and day to clean up the remediation site and has opened an inspection in this matter. These workers' employers must provide PPE as necessary to protect them against hazards at the site.

All involved Federal agencies expect NS to do the utmost to protect the safety and well-being of the people affected by this incident and its aftermath.

Sincerely,

A handwritten signature in blue ink, appearing to read "Amit Bose".

Amit Bose
Administrator
Federal Railroad Administration

A handwritten signature in blue ink, appearing to read "Douglas L. Parker".

Douglas L. Parker
Assistant Secretary of Labor
Occupational Safety and Health
Administration

NS Response:

NS ensured that employees were provided proper PPE for their job tasks.

CTEH contractors – Industrial hygiene and toxicology experts – were immediately deployed by NS and arrived at the site overnight on February 4, 2023. CTEH began conducting air monitoring around the site and the community at approximately 2:00 am on February 4th. CTEH conducted air monitoring at all work areas prior to workers entering the area. This real-time, work area-specific air monitoring, along with job safety analysis (JSAs) developed by CTEH prior to the derailment for potential vinyl chloride and butyl acrylate exposure, supported decisions regarding the level of PPE required for specific job tasks in particular worksite areas.

NS BMWED Engineering employees were required to wear OSHA Level D PPE only, while working at the site (e.g., boots, hard hat, safety glasses, hearing protection). NS BMWED Engineering employees did not work in areas requiring respiratory protection, as ensured by multiple layers of CTEH air monitoring: real-time handheld air monitoring, analytical stationary air monitors, and personal air monitoring badges for employees upon request.

As the incident response advanced, NS continued to work diligently to ensure the safety of employees onsite, including by taking the following actions:

Since Day 1, NS (supported by CTEH) has worked closely with Incident Command and the EPA Safety Officer in ensuring workplace safety at the Site. NS also meets regularly (nearly weekly) with OSHA representatives on site, to review workplace safety at the site on a regular basis.

NS conducted job briefings with NS Engineering employees each day that employees were on site, beginning on February 4th – the first date that NS BMWED employees were deployed to the site. During the job briefings, NS supervisors explained the employees' job duties and work area, and identified the regulated area where NS Engineering employees were permitted to safely work, which was informed by CTEH air monitoring. CTEH was present for many of these briefings, and was available to answer questions.

NS supervisors also explained that NS BMWED Engineering employees were not permitted nor assigned to work in areas requiring respiratory protection.

NS also provided face masks for voluntary use, which were not required to be worn based on CTEH's air monitoring data. NS provided N95 respirators for all employees.

NS further offered personal air monitoring, or badging, for any employee that requested it. For any employees that requested personal air monitoring, NS provided air monitoring results within the regulatory timeframe. The personal air monitoring results, to date, show no action level exceedances for analysts being monitored, including VOCs, and further confirm that NS BMWED employees were not working in areas requiring respiratory protection.

NS and CTEH, in coordination with BMWED union representatives, scheduled several meetings for BMWED employees, and set up a telephone hotline for employees to ask CTEH any questions or express concerns. As of June 21, 2023, CTEH received no calls from NS employees.

On March 2, 2023, the CDC/National Institute for Occupational Safety and Health facilitated a meeting with BMWED, NS management, and CTEH. The primary purpose of this meeting was to address concerns about exposures to employees working at the site and associated health risks.

On March 8, NS management team, including our Vice President Engineering hosted a meeting with CTEH, BMWED officers, and about 100 craft personnel in Niles, Ohio to discuss employee health concerns. That meeting lasted over four hours (including lunch), until all employee questions were answered.

On March 21, NS held another virtual meeting, via Teams, for employees who weren't able to attend the Niles meeting in person. APPENDIX A: AGGREGATED DEMOGRAPHIC INFORMATION OF SURVEY RESPONDENTS

On March 28, we provided a Frequently Asked Questions document prepared by CTEH and an air monitoring map to BMWED leadership. The FAQ document was targeted at questions that came up during the in-person and Teams meetings including health effects associated with short-term exposure to chemicals present during the initial phases of the response, cancer risks, testing for exposure to chemicals, and the timeline and results of air monitoring. The FAQ document also provided a telephone number for a CTEH hotline where employees with additional questions could be connected to a toxicologist.

Air monitoring continues to this day for all site activities (both work site monitoring and community monitoring), and all employees at the site are provided a written copy of air monitoring results.

FRA Follow-up:

This issue is now closed.

March 9, 2023, Letter to Industry (NS copy):



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

March 9, 2023

Mr. Alan Shaw
President & Chief Executive Officer
Norfolk Southern Railway
650 West Peachtree Street, NE
Atlanta, GA 30308

Dear Mr. Shaw:

I am writing in response to your letter to Secretary Buttigieg in which your railroad agreed to join the Confidential Close Call Reporting System (C³RS). The Federal Railroad Administration (FRA) welcomes your commitment to participating in the program, which research shows works to reduce collisions, injuries, and deaths because it encourages corrective action.

As part of this commitment, FRA looks forward to Norfolk Southern Railway's attendance at the Tuesday, March 14th meeting of the RSAC C³RS Working Group. Because RSAC brings together all segments of the rail community to work collaboratively on railroad safety issues, I believe it will be an effective forum for discussing how to expand stakeholder involvement in C³RS. FRA looks forward to robust participation by all Working Group partners next week and at future Working Group meetings.

If you have any additional questions about C³RS or upcoming RSAC C³RS Working Group meetings, please contact Mr. Robert Castiglione, Staff Director, Safety Partnerships Division, at 817-247-3707 or robert.castiglione@dot.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Amit Bose".

Amit Bose
Administrator

NS Response:

NS agreed, along with all Class I railroads to join the C³RS RSAC working group. FRA participated in several meetings with NS leadership discussing C³RS, presenting the program and answering questions. NS held a meeting with SMART General Chairman in June this year to discuss FRA's C³RS program to get labor's feedback and overall thoughts of the program.

FRA Follow-up:

All Class I railroads, AAR, American Short Line and Regional Railroad Association (ASLRRA) and labor organizations are participating in the C³RS RSAC working group.

June 14, 2023, Letter to NS:



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

June 14, 2023

Ms. Nabanita Nag
Executive Vice President & Chief Legal Officer
Norfolk Southern Corporation
650 West Peachtree Street NW
Atlanta, GA 30308

Re: Mandatory Immediate Action: Grave Deficiencies in Norfolk Southern's Conductor Certification Program.

Dear Ms. Nag:

This correspondence urgently raises substantial issues that require your immediate attention.

The Federal Railroad Administration (FRA) has engaged with Norfolk Southern Railway (NS) for nearly two years to correct shortcomings in NS's conductor certification program, required by 49 C.F.R. part 242. FRA first raised concerns regarding deficiencies in NS's conductor certification training program in October 2021 following several serious accidents and incidents, including five involving conductors/brakemen who suffered amputations and other serious injuries between March and October 2021. Two of those accidents involved conductors who had less than one year of service. Despite these incidents, FRA's assessment is that NS has not developed an adequate conductor certification training program.

FRA's ongoing audit of the NS's conductor certification program, per section 22410 of the Infrastructure Investments and Jobs Act (IIJA) Pub. L. 117-58, 135 Stat. 432, has laid bare grave deficiencies that NS must rectify immediately. The magnitude and significance of these shortcomings, especially in the context of the large number of new hires currently undergoing training, necessitate swift and decisive action on NS's part.

During the audit, FRA has observed new hires grappling to comprehend, internalize, and retain the critical safety information presented in training. New hires 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 audit, the FRA has identified three pressing concerns, each mandating immediate and substantial corrective action. As stipulated by section 22410(c) of the IIJA, NS is obliged to address these deficiencies promptly and restructure its program with the utmost urgency. FRA requires that NS respond swiftly to each critical inadequacy and present a detailed action plan addressing each of the elements below to the FRA within seven (7) calendar days of

the date of this letter along with a timeline for completing implementation of the plan that does not exceed ninety (90) calendar days of the date of this letter. The implementation plan must include a schedule for re-training those conductors who were trained under the non-compliant program.

Finding 1: The 13-day window for training in NS's conductor training program is grossly inadequate, allowing certification in an unacceptably brief period. This is incompatible with the demands of a Class I freight railroad operation.

Corrective Measure: *Extend the training program duration to provide adequate time to gain adequate knowledge, experience, and skills to trainees:* NS must immediately expand the training program duration to ensure comprehensive knowledge acquisition, skill development, and practical experience. An immediate reevaluation and substantial extension of the current 13-day training cycle are non-negotiable.

Finding 2: NS's current conductor On-the-job (OJT) field training lacks consistency, structure, and proper oversight, and therefore fails to ensure new hires are acquiring the necessary skills for performing safety-related duties. For example, when conductor trainees were first brought to an assigned terminal, the local terminal managers were not provided a defined process to follow, and FRA found NS failed to have training coordinators on site to assist with the transition from classroom training to OJT, and OJT evaluation forms were significantly less comprehensive than those used by the training center, i.e., checking approximately 19 elements as opposed to 40. Without a properly implemented OJT field training program, there is a heightened risk that trainees may develop incorrect or unsafe work practices that may compromise safety.

Corrective Measure: *Implement objective standards, track measurable progress, and properly train those managers, coordinators, and mentors who perform any oversight duties in OJT field training:* At a minimum, on a system-wide basis, NS must promote uniform skill acquisition through objectively measured standards, record that progress, and disseminate that information to those employees, training coordinators, mentors, and managers who have active roles in the effectiveness of the training program. Further, the oversight must provide early detection and correction of unsafe work habits among trainees.

Finding 3: NS has failed to comply with FRA's training 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 addition, this systemic violation appears to have contributed to problems with field training described in "Finding 2," by failing to ensure that only appropriately experienced conductors, capable of quality instruction and training, are selected.

Corrective Measure: *Strictly follow the concurrence process set forth at 49 CFR 242.7 in the selection of qualified instructors, ensuring joint selection by a designated railroad officer and a designated employee representative.* In situations where concurrence is not obtained, the selected instructor must demonstrate at least 12 months of service as a train service employee.

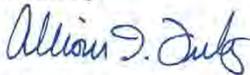
Given the gravity of these concerns, NS's responsibility to comply with Federal rail safety requirements and ensure comprehensive training for newly hired individuals cannot be overstated.

NS must take immediate steps to complete the required corrective measures described above.

Additionally, FRA will consider enforcement action based on NS response to and mitigation of these issues. Should NS fail to satisfactorily address these urgent concerns, FRA will not hesitate to enforce its regulations or to invoke the provisions outlined in IIJA Section 22410(d)(3), which requires FRA to notify Congress if a railroad is not cooperating with an audit. FRA will report non-compliance and refusal to cooperate to the relevant Senate and House Committees, indicating that NS's program is deficient and will disapprove NS's proposed training regimen.

Forward any queries to Christian Holt, Staff Director, Operating Practices: christian.holt@dot.gov; (202) 366-0978. FRA will also provide a copy of this letter to the president of each labor organization representing NS's affected employees.

Sincerely,



Allison Ishihara Fultz
Chief Counsel

cc:

Mr. Jeremy Ferguson, President, SMART-Transportation Division
Mr. Eddie Hall, President, BLET

NS Response:

NS replied in a letter dated June 19, 2023. NS stated they take this issue seriously and will partner with FRA to achieve safety. NS provided an overview of the training program, and stated they have contracted with Atkins Nuclear Solutions to work on improving their safety culture and evaluating the training program.

FRA Follow-up:

On July 17, 2023, NS provided an update on the status of its action plan addressing its Conductor Certification Program.

June 30, 2023, Letter to NS:



U. S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

June 30, 2023

John Fleps
VP Safety & Environmental
Norfolk Southern Railway Company
650 W Peachtree Street NE
Atlanta, GA 30308

Re: Disapproval of Part 217 Program of Operational Tests and Inspections

Dear Mr. Fleps:

Pursuant to my authority under 49 CFR § 217.9(h), I am disapproving the Norfolk Southern Railway Company (NS) RP-1 Supervisor Guidelines for Conducting Efficiency Checks ("Program"), dated June 5, 2023, which NS identified as the program of operational tests and inspections required by section 217.9(c). My decision to disapprove the Program, which is effective on the date of this letter, is based on the Program's noncompliance with the following requirements:

- § 217.9(c)(2): The Program fails to require a minimum number of tests and inspections per year covering the requirements of part 218, subpart F for certain workers, including engineers, train and engine service employees, and other groups subject to testing under part 217.
- § 217.9(c)(3): For all operational tests and inspections, the Program fails to describe each type of operational test and inspection required, including the means and procedures used to carry out such tests and inspections. The noncompliant descriptions of means and procedures for tests and inspections include those for tests related to Handling Switches and Derails; Shoving or Pushing movements, Securement of equipment, Blue Signal Tests; Utility Employee, Mechanical Department Reporting Categories for Equipment Operation; Engineering Department Reporting Categories; and On-Track Equipment, Switches, Derails, & Electronic Devices, as identified in the Program.
- § 217.9(c)(3): The railroad specifically failed to describe the procedures for testing for speed compliance and adherence to restrictive signal indications required under Part 240 for the qualification of locomotive engineers. The lack of described procedures could invalidate the qualification and requalification of locomotive engineers under the railroad's Part 240 program.

Page 2

- § 217.9(c)(5): For all of the required tests and inspections, the Program fails to state the frequency with which each type of operational test and inspection is to be conducted.

Under 49 CFR section 217.9(h)(1), you have 35 days from the date of this letter to either amend the Program and submit it to me for approval, or to provide a written response in support of the Program, or both.

Please contact Christian Holt, Staff Director, Operating Practices at (610) 858-3312 or christian.holt@dot.gov if you have any questions regarding the issues raised in this letter.

Respectfully,



Karl Alexy
Associate Administrator for Safety

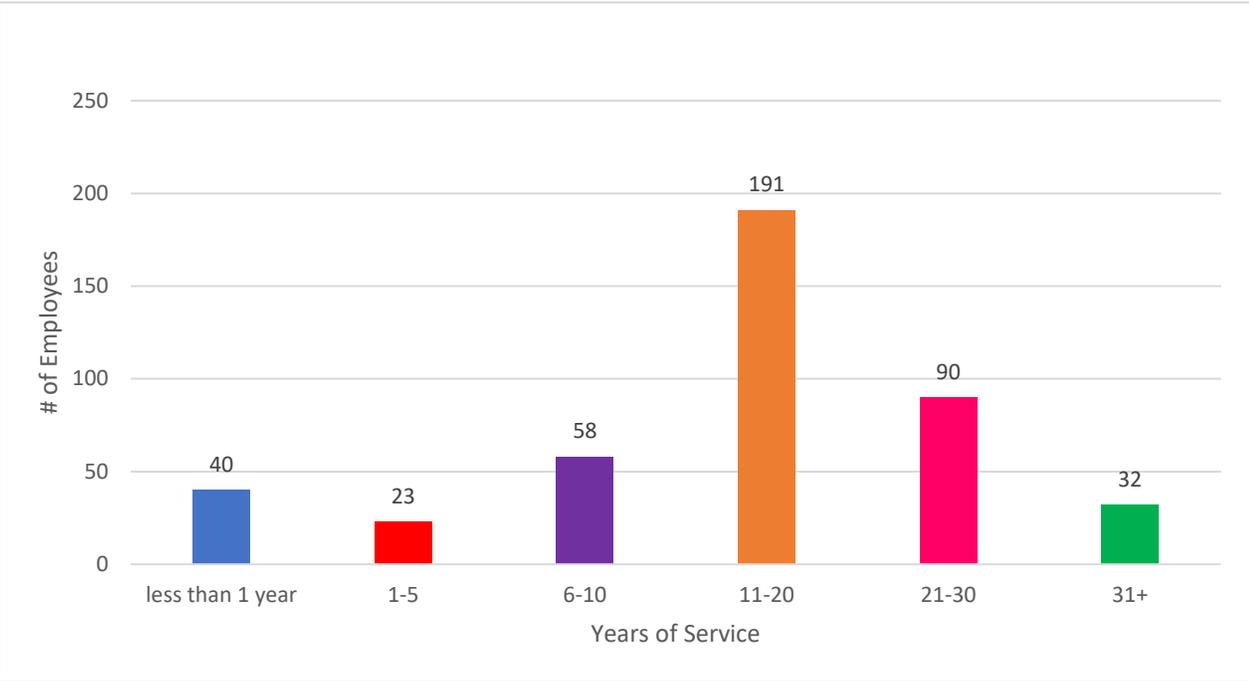
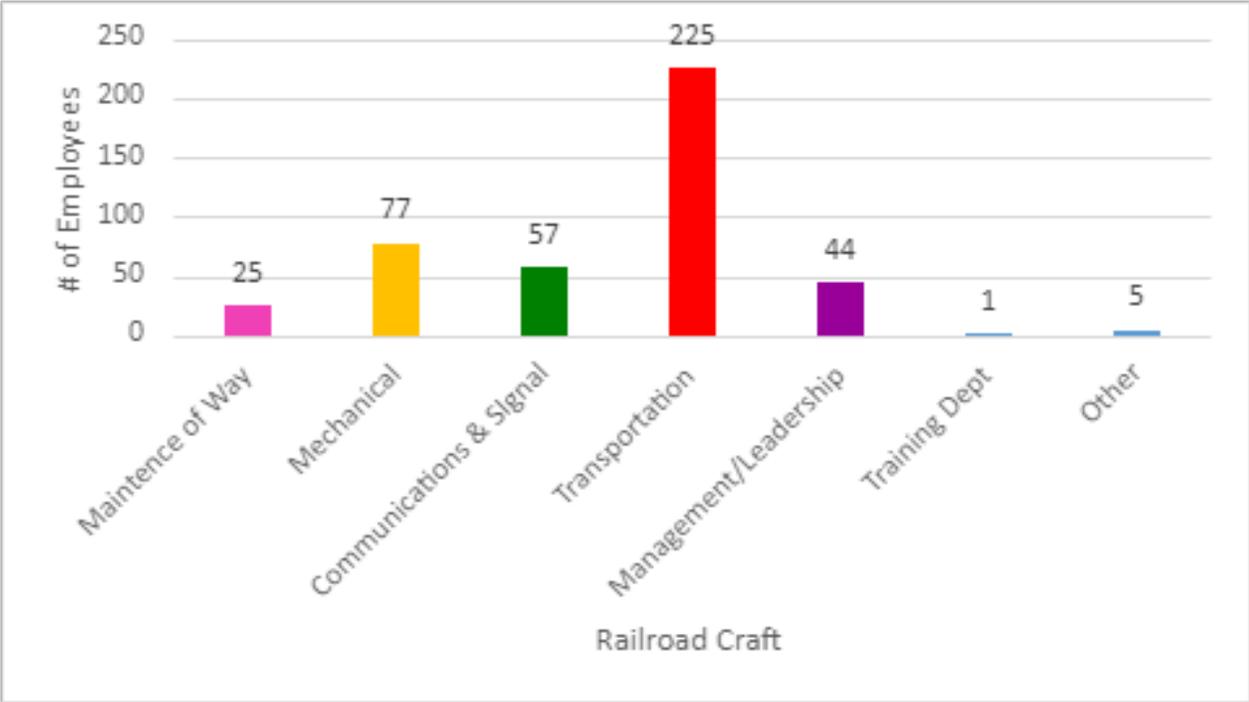
NS Response:

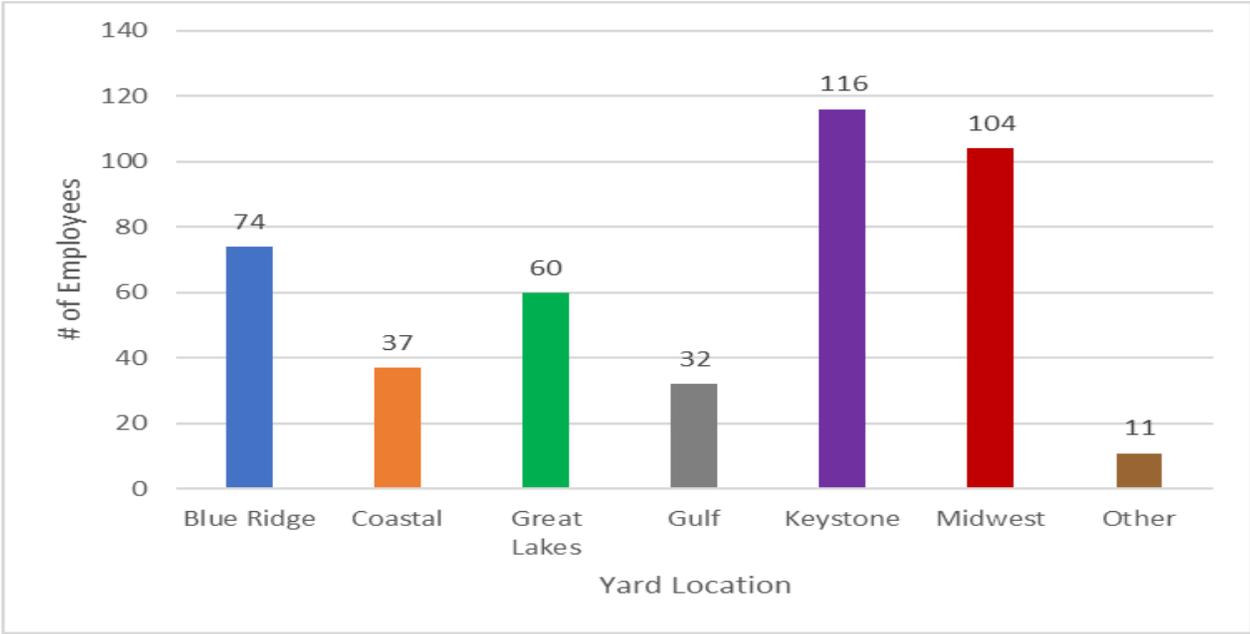
NS requested an internal call with FRA for July 17th to urgently address the deficiencies identified in FRA's disapproval letter.

FRA Follow-up:

NS provided a written response to FRA on July 17, 2023; FRA is currently reviewing this response.

APPENDIX D: AGGREGATED DEMOGRAPHIC INFORMATION FROM NS RESPONDENTS





APPENDIX E: SAFETY CULTURE QUESTIONNAIRE NORFOLK SOUTHERN

Use this questionnaire while performing an assessment on NS safety culture. These questions mirror the link below. Please ensure that if you use the paper copy you will still be **required** to enter the results on the link (through Forms).

Examples and Rationale if applicable is listed in blue under the question.

General Information

A strong safety culture is defined as “the shared values, actions, and behaviors that demonstrate a commitment to safety over competing goals and demands.”

1. Date questionnaire was completed:
2. Your workgroup (Example: GXTO, OP, SMT):
3. State (Example: OH, PA, MD, two letter code):
4. City (Example: Canton, Columbus):
5. Norfolk Southern’s Division Name:
6. Norfolk Southern’s Yard Name or Subdivision (Example: Queensgate Yard, Collinwood Yard, Buffalo Line, Headquarters, etc.):
7. Craft of the employee surveyed:
8. Years of service:

Leadership Is Clearly Committed to Safety

The importance of leadership in fostering a strong safety culture is indicated by the fact that almost all safety culture models explicitly mention leadership’s commitment to safety. Leaders across all layers of a railroad must model safety-first attitudes and behaviors. Employees learn what the accepted practices are in a railroad by following the examples set by its leaders.

9. Norfolk Southern Senior leaders empower frontline supervisors and employees to prioritize safety.
10. Any additional comments regarding Leadership’s Commitment to Safety?

The Railroad Practices Continuous Learning

Maintaining a strong safety culture necessitates a learning environment where opportunities to improve safety are continuously sought out and implemented. Railroads must be open to learning from accidents when they do happen and willing to make changes to prevent incidents in the future.

11. Norfolk Southern reports lessons learned after accidents, incidents, near misses, inspections, and test results to managers and employees.
12. Norfolk Southern has developed and implemented a Safety Action Plan (SAP).

SAP will: identify safety performance history; outline obstacles to a safe operation; specify risk mitigation techniques; and assign responsibilities for implementation of each component.

13. Any additional comments regarding Norfolk Southern's Continuous Learning practices.

Decisions Demonstrate that Safety Is Prioritized Over Competing Demands

An organization with a strong safety culture uses decision-making processes demonstrating that safety is prioritized over competing demands. Railroads with a strong safety culture will consistently choose safety over performance when faced with the choice of cutting corners to increase performance.

14. Norfolk Southern has us conduct a Job Safety Analysis (JSA) at daily job briefings.

In a JSA, each basic step of the job is analyzed to identify potential hazards and to recommend the safest way to do the job.

15. Any additional comments regarding Norfolk Southern's Prioritization of Safety over Competing Demands.

Reporting Systems and Accountability Are Clearly Defined

Organizations must ensure that reporting systems and lines of accountability are in place so that safety issues can be promptly identified, fully evaluated, and addressed and corrected commensurate with their significance.

16. Norfolk Southern has a program or policy that ensures safety concerns are noted and the appropriate follow up actions are taken.

Employees should be able to easily report safety concerns to management. When an issue is important enough for an employee to bring to management's attention, give the employee and the safety concern full attention.

Respectful listening is essential and dealing with employee problems and concerns is not a work interruption. It is part of a manager or supervisor's responsibilities. Concerns reported by employees should be investigated and resolved promptly. Dealing with reported concerns consistently and transparently will help increase trust, which will further encourage employees identify their safety concerns.

17. Any additional comments regarding Norfolk Southern's Reporting Systems.

There Is a Safety-Conscious Work Environment

Maintaining a strong safety culture requires constant vigilance and an elevated awareness of the importance of safety. Employees should be encouraged to raise safety concerns and provided opportunities to raise concerns through reporting systems and procedures.

18. Norfolk Southern uses visual clearance aids, signs, and markers.

Utilization of visual aids removes guess work out of backing or shoving movements and may help to standardize car count and distance measurements across the workforce. These items and methods can be used to clearly mark fouling points and line of sight clearance points for placement or storage of rolling stock on tracks adjacent to mainlines at public grade crossings. Include Mechanical, MOW understanding.

19. Any additional comments regarding Norfolk Southern's Safety-Conscious Work Environment.

Employees Feel Personally Responsible for Safety

Employees who feel personally responsible for safety take more ownership in following safety procedures and are also more likely to speak up when they see other employees behaving in an unsafe manner. Personal responsibility empowers employees and helps the entire organization identify and correct risks proactively. For the SLSI, empowerment means ensuring employees have the skills, knowledge, resources, and authority to make safe choices within an acceptable range of options.

20. Norfolk Southern empowers employees to make safe decisions. Norfolk Southern employees feel able to stop or refuse to perform an unsafe action by issuing a good faith challenge or other safety challenge.

21. Any additional comments regarding how Employees feel Personally Responsible for Safety.

There is open and effective communication across the Railroad

Employees must feel comfortable communicating with their supervisors about safety issues and communicating with their peers when they see unsafe behaviors. If the railroad is not communicating the importance of safety and encouraging employees to speak up about safety, safety risks are more likely to develop and less likely to be addressed before an accident occurs.

22. Norfolk Southern routinely communicates safety information in a way that is easy to find and understand.

Easy to find can be it's always in the same place or it's always distributed in multiple ways. Easy to understand is just that – I know how this info can help me be safer at my job.

23. Any additional comments regarding Norfolk Southern's Communication and its Effectiveness across the Railroad.

Mutual Trust Is Fostered between Employees and the Railroad

One of the cornerstones of any positive organizational culture is trust. Trust between all railroad employees, from craft employees to senior leaders, can go a long way in supporting safety by facilitating open and honest communication and minimizing fears of reprisal. Employees who have developed a relationship of trust with their supervisors may feel more willing to raise safety concerns in novel situations when they are unsure of how the railroad might respond.

24. Norfolk Southern encourages its managers to have employees accompany managers during operational testing.

Employees can accompany a manager during normal routine operational testing. This will allow employees to better understand the purpose of the testing program and the meaning of the rules being tested.

25. Any additional comments regarding Mutual Trust between Employees and the Railroad.

The Railroad Is Fair and Consistent in Responding to Safety Concerns

Above and beyond having effective reporting procedures and processes in place, the railroad must respond to safety concerns in a manner that employees perceive as fair, just, and consistent. Employees should feel free to raise safety concerns without fear of retaliation.

26. Norfolk Southern notifies employees of unacceptable behaviors and implements corrective actions before making a disciplinary action.

27. Any additional comments regarding the railroad being fair and consistent in responding to safety concerns.

Training and Resources Are Available to Support Safety

Those who manage and operate the system must have current knowledge of all human, technical, organizational, and environmental factors affecting the safety of the whole system, and have tools and equipment available to perform their job duties in the safest manner possible. In addition, the organization must ensure that the personnel, procedures, and other resources needed to ensure safety are available. Understaffing safety-critical positions or not having formal, written procedures for ensuring safety can be just as detrimental as a lack of physical equipment.

28. Norfolk Southern provides its employees with the appropriate, specialized training needed to safely perform their job duties.

For example, employees handling hazardous materials have active planning and participation in emergency response exercises involving railroad managers and employees and local emergency responders can improve regulation knowledge and operations preparedness.

29. Norfolk Southern offers frequent refresher trainings so employees can stay up to date with their skills and information.

30. Any additional comments on Norfolk Southern's Training & Resources & the availability of the training to support Safety.

APPENDIX F: SEMI-STRUCTURED INTERVIEW QUESTIONS (GENERIC)

XXX Railroad Safety Culture Railroad Leader Interview Summary

FRA Audit Number:

Auditee (Railroad): Railroad (XXX)

FRA Attendee Names: *Name, Audit Management Div. (Interviewer)*

Audit Interviewee Name:

Date & Time of Interview:

Location of Interview: *Virtually over Microsoft Teams*

Purpose of Interview:

FRA and XXX Railroad Leader Interview to discuss XXX's Safety Culture.

Summary of Interview:

Interview started with a brief introduction of XXX Interviewee and FRA staff.

FRA explained that the Safety Culture Interviews were to determine how XXX leaders feel about the current culture, and there are no incorrect answers. FRA plans to gather data using the following methods:

1. Asking a series of questions during the interview.
2. Accepting any information Railroad Leaders want to provide that FRA does not ask.
3. FRA Auditors/Inspectors will ask the same questions to all XXX interviewees.

Below are the questions FRA asked and XXX Railroad Leaders answers provided.

1. Does NS have a safety mission statement?
2. How are NS' safety values communicated to your frontline managers?
3. How are your safety values communicated to frontline employees?
4. Describe the field presence and contact managers have with the workforce?

5. What are some safety initiatives you deployed?
6. Do you have any initiatives that encourage employees and managers to feel personally responsible and connected to safety at the railroad?
7. Do you have any initiatives that foster trust between employees and the railroad?
8. Are employees empowered to stop unsafe actions or refuse to work in an unsafe condition without retaliation?
9. Is there a method in place for employees to report close-calls incidents?
10. Briefly describe your discipline policy.
11. Does railroad have any recognition programs that encourages activities that build your safety culture?
12. What training and resources are available to support safety?

Additional Notes:

XXX Railroad Safety Culture Labor Leader Interview Summary

FRA Audit Number:

Auditee (Railroad): Railroad (XXX)

FRA Attendee Names: *Name, Audit Management Div. (Interviewer)*

Audit Interviewee Name:

Date & Time of Interview:

Location of Interview: *Virtually over Microsoft Teams*

Purpose of Interview:

FRA and XXX Labor Leader Interview to discuss XXX's Safety Culture.

Summary of Interview:

Interview started with a brief introduction of XXX Interviewee and FRA staff.

FRA explained that the Safety Culture Interviews were to determine how XXX labor leaders feel about the current culture, and there are no incorrect answers. FRA plans to gather data using the following methods:

1. Asking a series of questions during the interview.
2. Accepting any information labor Leaders want to provide that FRA does not ask.
3. FRA Auditors/Inspectors will ask the same questions to all XXX interviewees.

Below are the questions FRA asked and XXX labor Leaders answers provided.

1. Do you know if XXX has a safety mission statement?
2. How does XXX's management/supervisors communicated safety values to you?
3. How do you communicate your safety concern to frontline managers/supervisor?

4. Describe the field presence and contact managers have with you and XXX's labor force?
5. Does XXX have any safety initiatives you are aware of?
6. Do you feel the current XXX initiatives encourage employees and managers to feel personally responsible and connected to safety at the railroad?
7. Do you feel that XXX initiatives foster trust between management and employees at the railroad?
8. Are employees empowered to stop unsafe actions or refuse to work in an unsafe condition without retaliation?
9. Is there a method in place for employees to report close-calls incidents?
10. What is your understanding about XXX's discipline policy?
11. Does railroad have any recognition programs that encourages activities that build your safety culture?
12. What training and resources are available for employee that help support safety?

Additional Notes:

APPENDIX G: NS SAFETY INITIATIVES SUPPLEMENTAL INFORMATION

Close Call Experience

Introduction

Have you experienced a situation where something could have gone wrong or where you, a co-worker, or anyone in the surrounding area could have been hurt but were not? Have you ever nearly just missed being involved in an accident? Have you ever



lost focus and missed an event that occurred right in front of you? All of these situations are close calls and they could have had a tragic outcome. The **Close Call Experience** provides an opportunity for all Norfolk Southern employees to share these types of events without the fear of discipline or retribution. Sharing your experiences provides you and your co-workers with an opportunity to discuss, evaluate, and learn from each other's close call experiences.

CCE History and Project Elements

After examining close call programs on other railroads, Norfolk Southern's leadership was convinced that sharing these types of events with all employees would promote safety through peer-to-peer conversations that open the lines of communication. NS believed that having agreement employees own and run the process through a diverse subcommittee of the Local Safety and Service Committee would provide the leadership and expert knowledge needed to address the underlying causes of close calls. Since subcommittee members performed the work, they would be in the best position to understand how a close call occurred and take action or recommend solutions to safeguard our work environment.

In 2014, the **Close Call Experience** started as a pilot

project through the Local Safety and Service Committee of the Chicago Terminal. NS Safety and Environmental, Operating Rules, and operations managers met with local labor leaders to develop a program where employees could report close calls without fear of discipline or retribution. Labor and management worked together to develop a process where close calls could

be submitted anonymously. Labor and management agreed that the CCE's would only be viewed and reviewed by an agreement employee subcommittee. A process was developed where the subcommittee removed any employee identifying information from the CCE's and shared them with the entire workforce to heighten awareness and stimulate critical safety discussions. The subcommittee was responsible for collecting, analyzing, removing identifying information, and publishing a CCE report for the LSSC and co-workers. The LSSC was tasked with taking or recommending corrective or educational actions to safeguard against future occurrences. Management's role was limited to reviewing the published CCE report with the subcommittee and the LSSC, and assisting with implementing needed training or corrective action. Managers were also tasked with providing support and resources to the subcommittee and the LSSC.

Following the success of the Chicago Pilot Project, CCE programs have been implemented or are in the development stages across the entire NS system.

What is a Close Call Experience?

A "Close Call Experience" is not an accident or incident. Rather, a Close Call Experience is any rule violation or unsafe practice that places employees or the public at risk. A close call can be as simple as unintentionally fouling a track when walking through a rail yard, or as serious as realizing you are going too fast when you are operating equipment. In both situations, nothing bad occurred, but the potential was there for an accident or injury.

Will I be disciplined for sharing a Close Call Experience?

No disciplinary action has been or will be taken for close calls submitted. The information will only be used by the LSSC and subcommittee to make recommendations for training, education, or other means of improving the safety of our employees. Your anonymity in making a close call report is serious business and is protected by your Local Safety and Service Committee, CCE subcommittee, and the Safety and Environmental Department.



What is not considered a Close Call Experience?

FRA reportable accidents or incidents, all injuries, stop signal or track authority violations, Rule G violations, excessive speeding as defined by FRA, or any other FRA de-certifiable rule violations are excluded from the Close Call Experience Program. Also CCE's submitted after the knowledge or discovery of the incident/rule violation by supervision are excluded from the program.

How does it work?

Local Safety and Service Committees will be responsible for promoting and administering the CCE program. Your close calls can be submitted electronically or on a paper form. To submit your close call electronically, go to www.closecall.nscorp.com from a computer on the company network. You can also find the close call site from links located on the Operations, Transportation, Mechanical, Engineering, Safety, or Local Safety and Service Committee web portals. The CCE database is accessible by all NS employees and submitted CCE's can be viewed and shared by all.

To submit a close call by paper form, obtain the form at your local reporting location, fill it out, and drop in any close call box located throughout the system.

The LSSC subcommittee will collect and analyze CCE's from the boxes and electronic submissions. They will enter the CCE's from the paper forms in to the CCE database. The subcommittee will make recommendations to the LSSC for enhancing safety. CCE forms will be provided to each location and are available through the SAP – materials ordering system.



Structure for LSSC

1. Each CCE location will establish a 2-3 person (up to five at our larger locations) CCE subcommittee from their LSSC members.
2. The CCE subcommittee will collect all paper forms submitted and remove identifying information before entering them in to the database.
3. CCEs requiring prompt corrective action will be immediately referred to the local sponsor or other applicable supervisor.

4. The CCE's will be reviewed at each LSSC meeting as a standing agenda item.
 - a. The CCE subcommittee will report on each new local CCE from the prior month.
 - b. The LSSC members (including the CCE subcommittee) and supervisor sponsor will evaluate each new CCE for:
 - i. Closure (no action required or issue already resolved)
 - ii. Local action (sponsor, LSSC and subcommittee to resolve)
 - iii. Divisional action (issue with impact beyond local area) – LSSC refers to Division Safety and Service Committee
 - iv. System issue to be referred to Safety and Environmental Department
 - c. Older CCEs with open corrective action will also be reviewed for status and closure
 - d. The monthly CCE report for the system will be printed from the close call site www.closecall.nscorp.com and posted throughout the LSSC's areas of responsibility.

Structure for Departmental CCE Committees

Some groups work on department or regional assigned positions. To include these employees, CCE subcommittees can be set up to meet the needs of these work groups or gangs.

1. The Department will have a 2-3 person CCE committee at each location that reports to a supervisor sponsor. Field reps will be selected to collect CCE information and forward them to the CCE committee
2. The CCE committee will collect all submitted CCEs and remove identifying information. The remaining information will be entered in to the CCE database.
3. CCEs requiring prompt corrective action will be immediately referred to the supervisor sponsor or other applicable supervisor
4. New and existing CCE's will be reviewed monthly with the supervisor sponsor for:
 - i. Closure (no action required or issue already resolved)

- ii. Local action (sponsor, LSSC and subcommittee to resolve)
- iii. Divisional action (issue with impact beyond local area) – LSSC refers to Division Safety and Service Committee
- iv. System issue to be referred to Safety and Environmental Department

5. The monthly CCE report for the system will be printed from the close call site www.closecall.nscorp.com and posted throughout the LSSC's areas of responsibility.

Ground Rules

- Close Call Experiences (CCE's) may be submitted electronically or by placing the paper form in a CCE drop box. Drop boxes may be installed by the LSSC or departmental/regional work groups. Only subcommittee members or agreement employees authorized by the subcommittee will have access to forms in the drop boxes.
- All CCE's will be accepted. Employees will be encouraged, but not required, to provide all available information so that the LSSC subcommittee can analyze what happened and provide recommended actions to prevent similar events.
- The CCE electronic or paper forms will record the department and experience. Providing additional information such as the **approximate** time of day and the day of the week is optional but helps by providing additional information that can be used by the LSSC for safety recommendations. Information submitted on the electronic or paper CCE form is "CONFIDENTIAL" *Employees may elect to give identifying information if they wish to be contacted by the CCE subcommittee.*
- At the employee's request the subcommittee will meet with the employee submitting the CCE. The meeting is to gather additional information and to develop lessons learned that improve peer to peer contacts and enhance safety.



SAFETY CONNECTION

EVERYTHING STARTS WITH SAFETY

July 2023

Equipment Securement

Properly securing equipment supports our injury and accident prevention focus.

- ✓ Equipment left standing must be properly secured with a sufficient number of effective handbrakes.
- ✓ Locomotives and cars must be properly tested for operative brakes.
- ✓ Do not couple to equipment unless known to be secured.
- ✓ On-Track equipment on or off rail must be secured, locked, and left clear of all in service tracks.
- ✓ Timetables, bulletins and special instructions should be reviewed for specific district and equipment securement instructions.

Rules for Review:

- ✓ OR: 1, 224 – 228, 819
- ✓ NS-1: C-102, L-203, L-236, L-243
- ✓ SGR: 1100 – 1106, 1193



TC #40153

SAFETY CONNECTION
EVERYTHING STARTS WITH SAFETY June 2023

Close Clearance, Close Track Centers, and Equipment in the Clear

Situational awareness, job safety briefings, and timetable/bulletin review are key to injury and accident prevention.

- ✓ During Job Safety Briefings, review timetables, bulletins, and special instructions to identify close clearances and close track centers.
- ✓ Identify close clearance signs while working in terminals, yards, and customer facilities.
- ✓ When riding/mounting/dismounting equipment, be alert to avoid any close clearance locations.
- ✓ Do not create close clearances for yourself or team members by leaving equipment fouling other tracks.
- ✓ Promptly report any equipment left in the foul to the proper authority.

Rules for Review:

- ✓ OR 20(a. 4-7)
- ✓ OR 27
- ✓ OR 223
- ✓ SGCR 1070

EVERYTHING STARTS WITH SAFETY
DRIVE DOWN
the
SUMMER SPIKE
NS

TC #40152

<http://www.closecall.nscorp.com/>