



U.S. Department of Transportation  
**Federal Railroad Administration**

# **FRA AUDIT REPORT**

**Union Pacific (UP) Railroad**

**FRA Audit Number: 2021-UP Special Audit-06-1**

**Report Date: November 8, 2021**

## Preface

*The Federal Railroad Administration (FRA) is not solely an auditing organization. Therefore, this performance audit does not strictly adhere to generally accepted government auditing standards (GAGAS). However, this performance audit was planned and performed to obtain sufficient and appropriate evidence, and to provide a reasonable basis for our findings and conclusions based on our audit objectives.*

## Executive Summary

The Federal Railroad Administration (FRA) has been monitoring the concerning high number of safety incidents and accidents at Union Pacific (UP). In addition, FRA inspectors have been alerting management to growing concerns they have regarding UP's safety performance throughout the UP operation. FRA has made many attempts to work with UP to reiterate the importance of complying with FRA regulatory standards in the Code of Federal Regulations (CFR); however, these attempts have been unsuccessful at producing systemic changes to enhance railroad safety.

Recent data indicates UP has been responsible for a significant number of reportable derailments, making them an outlier in the railroad industry for Class I railroads. Between 2018 and 2020 (the latest year for which a full year's data are available), UP reported train miles that represented a decreasing percentage of the total train miles reported by all Class I railroads, from 26% in 2018 to 24% in 2020 (Table 1).

During the same period, UP's total number of derailments reported to FRA represented 35% of all Class I reportable derailments in 2018, 40% in 2019, and 37% in 2020. UP's derailment data, therefore, comprises a disproportionate share of the overall Class I railroad derailments in the past few years.

**Table 1. UP operational data as a percentage of all Class I operational data reported to FRA between 2018 and 2020.**

	<i>Calendar Year 2018</i>	<i>Calendar Year 2019</i>	<i>Calendar Year 2020</i>
<b>Yard Switching Miles</b>	31%	31%	31%
<b>Total Train Miles</b>	26%	25%	24%

Since there has been no decline in reportable derailments commensurate with the decrease in train miles, FRA believes the causes are more complex and merit a broader examination than would occur with its normal inspection processes. As a result, FRA decided to conduct a special audit covering multiple disciplines from late July through early September 2021.

## Significant Findings

During this special audit in the summer of 2021, FRA focused on seven discipline areas. The seven disciplines audited were: Critical Incident Stress Plans, Grade Crossings, Hazardous Materials, Motive Power & Equipment, Operating Practices, Signal & Train Control and Track. Overall, FRA identified several findings that UP needs to address. This section highlights the most significant findings in each of the disciplines.

Interviews with UP's managers, Peer Support Team (PST) members, and union and regular employees resulted in several findings in the Critical Incident Stress Plans (CISP) area. FRA found there was confusion from all levels within UP around the CISP requirements and CISP applicability. Because some UP staff are unaware that UP's CISP is a required policy under 49 CFR Part 272, and not just a voluntary program, the implementation of UP's CISP is inconsistent. This may lead to some employees not being offered the required support and relief when they are involved in a critical incident. Therefore, UP should take steps to improve understanding at all levels of the CISP requirements and appropriate implementation of the UP CISP program to ensure success.

The Grade Crossing discipline identified 13 highway-railroad grade crossings in Houston, TX, that had two or more collisions between 2016-2020. While visiting the Winkler Drive crossing, FRA noticed flashing lights and gates activated, yet no train approaching. Soon after, FRA witnessed a near head-on collision between a tractor trailer and a motor vehicle, both of whom were attempting to go around the lowered gates. FRA discovered that approximately 0.5 miles from the crossing, a UP Maintenance-of-Way (MOW) group was working. After speaking with the MOW group, FRA learned that they had not followed procedure to notify UP Signal Maintenance of their activity. This failure to follow safety rules could have resulted in a serious accident. Therefore, UP should take steps to ensure employees are aware of the importance of complying with rules and regulations associated with active highway-railroad grade crossings.

When FRA reviewed train consists for compliance with hazardous materials (Hazmat) regulations, they found ten instances of inaccurate train consists. The majority of the defects reflected an improper location of the Hazmat shipment within the train. However, in three of these instances, Hazmat shipments were not listed on the train consists at all. Failure to accurately document the presence and location of Hazmat in the consist can lead to delays in effective emergency response in the event of a serious train derailment and increased safety risks to the lives and health of emergency responders. Therefore, UP should take steps to ensure employees have access to accurate information about the presence and location of Hazmat in all consists.

FRA noted that in the last four and a half years (January 2017 to July 2021), UP's average defect ratio for Blue Signal Protection for Workers (49 CFR Part 218, Subpart B) was 2.6%. However, during FRA's brief audit period from late July to early September 2021, UP's defect ratio was 4.5%, which is almost 2% higher than their four and a half year average. This is troubling due to the potential for injury of UP employees working around rolling equipment. Therefore, UP should take steps to ensure that all employees are aware of, and compliant with, the requirements of Blue Signal Protection for Workers.

Operating Practices inspectors noted that, although UP's testing officers focused their evaluations on switching-related rules that historically show an important correlation to employee injuries, there was a noticeable lack of testing for radio use, remote control operations and remote control zones, utility employees (where applicable), and restricted speed, all of which have been shown to play a role in causing accidents, incidents, and injuries on railroad property. Therefore, UP should take steps to ensure that operational tests include all regulatory requirements that correlate to human factors accident causation.

Signal & Train Control inspectors noted instances of UP employees not complying with 49 CFR § 234.209 - *Grade Crossing Interference*, which establishes that employees working in the roadway approaches to grade crossings must take the proper steps to ensure that adequate protections are in place or provide an alternative method to maintain safety. This noncompliance led to false activations of the grade crossing warning systems. Therefore, UP should take steps to ensure that all employees are aware of, and compliant with, the requirements for ensuring that adequate protections are in place when they work near grade crossings.

Finally, the Track discipline found a high number of defects related to loose joint bars and loose adjustable rail braces, as well as lost or missing frog bolts in main tracks. In fact, in 466 units of main track walking inspections, FRA identified 972 defects. Each of these types of defects increases the likelihood of track-caused derailments. Therefore, UP should take steps to ensure that their track inspection program includes effective methods of detecting all track defects.

## **I. Audit Objective, Scope, and Methodology**

The objective of this broad special audit was to look at UP's operations to determine whether UP is complying with FRA regulations and to determine whether there are changes to existing processes or policies needed to improve overall compliance and safety performance.

To achieve the objective, for several weeks from late July through early September 2021, FRA inspectors, specialists, and other staff conducted targeted inspections, interviews, and observations in 20 states where UP operates. More than 100 FRA leaders and staff were involved in this joint effort.

## **II. Audit Findings/Results by Discipline**

### **A. Critical Incident Stress Plans (CISP)/49 CFR Part 272**

Criteria: 49 CFR Part 272 requires UP to develop and implement a CISP, specifically:

[T]o promote the safety of railroad operations and the health and safety of railroad employees, especially those who are directly involved in a critical incident by requiring that the employing railroad offers and provides appropriate support services, including appropriate relief, to the directly-involved employees following that critical incident.

FRA approved UP's CISP submitted December 5, 2015. FRA's audit focused on whether UP complies with its own CISP, and also sought to identify either issues that were not well addressed by the plan, or problems with effective implementation of the program.

At UP, the CISP program is led by managers in charge of its Employee Assistance Program (EAP), and implementation is supported by a network of Peer Support Team (PST) members. On August 19, 2021, FRA met with EAP and PST leaders and subsequently conducted interviews with UP front line managers, members of the PST and representatives of labor organizations. FRA made findings and recommendations for improvement in four areas.

- 1. Practical knowledge of UP's CISP throughout the railroad can be improved.*

Interviews revealed there may be some underlying confusion among employees regarding what is required under 49 CFR Part 272. Although employees and managers were generally aware that UP policies included a CISP, some were unaware that it was required under 49 CFR Part 272 and not a voluntary UP program. In addition, interviews revealed inconsistent application of the UP CISP policy due to a lack of clarity regarding when implementation of CISP is required. Some managers reached out to the PST after most incidents for clarification, but others used their own criteria to determine if an incident qualified as a critical incident under UP's CISP. Finally, although employees not closely involved in the Peer Support program seemed to know about

both the Peer Support and the EAP offered at UP, they were unsure what was required following a critical incident. This lack of clarity and consistency may lead to employees not receiving relief and support, even though such relief and support should be available under the terms of UP's CISP.

Interviews with UP managers, employees, and union representatives revealed that one of the most valuable aspects of UP's CISP was the PST. However, some PST members reported resistance to their implementation of UP's CISP program and general critical incident policy by managers with inadequate knowledge of UP's policy and 49 CFR Part 272 requirements. Furthermore, some of those interviewed expressed concern that there were not enough PST members to provide services to all employees involved in a critical incident.

FRA reviewed the contents of UP's current CISP training for managers. It covers elements relating to critical incidents and providing psychological first aid in the immediate aftermath of an incident. FRA notes that while the training program included excellent practical exercises for appropriately and effectively interacting with incident-involved employees, as well as an overview of UP's CISP policy, the training lacks any discussion of the requirements of 49 CFR Part 272. Interviews from managers, employees, and union representatives all agreed that UP's CISP and EAP work well when followed, but the interviews also revealed a great disparity in understanding among managers on a manager's duties following a critical incident, UP's policy, and 49 CFR Part 272 requirements. Both the training itself and interview reports revealed the following weaknesses related to training:

- a. Some managers are still not sure what is and is not a critical incident;
- b. Some managers are unsure when UP's CISP applies; and
- c. Some managers may not be following UP's criteria (and the definition found in 49 CFR § 272.9) and use other criteria to make determinations of when an incident should be classified as critical.

FRA reviewed materials used in training PST members and interviewed team members regarding their training. Overall, PST members reported being satisfied with the training they received. However, they noted a few areas for improvement. Specifically:

- a. Some PST members indicated that refresher training has not been offered for PST members and that their initial training was over two years ago; and
- b. Some PST members noted that the training they received was not offered to all employees. PST members indicated that they have tried to speak at new employee orientation meetings but lately, due to manpower limitations and other restrictions, this has become increasingly difficult.

Based on interviews, FRA notes that many PST members have been involved in a critical incident and can provide firsthand information regarding what happens in the immediate aftermath of a critical incident. They also can provide information regarding the need for and importance of relief after a critical incident. The PST and EAP personnel have the most current information on UP's CISP, Part 272 requirements, and additional assistance options that UP may make available to employees. Furthermore, PST members and EAP personnel would be able to

provide answers for any questions or clear up any confusion that managers have during the training.

### **Recommendations**

- a. Evaluate ways to improve employee understanding of UP’s CISP program requirements and what to expect from the program in the aftermath of a critical incident and implement the most effective and practical methods. Consider the following:**
  - i. Including training on critical incidents as part of new employee orientation/training.**
  - ii. Developing a pre-recorded training or presentation (similar to what is currently offered to managers) to offer to new employees if PST members are unavailable.**
- b. Evaluate and implement ways to improve manager awareness of and compliance with the requirements of UP’s CISP. Consider the following:**
  - i. Including training with specific sections on Part 272 plan requirements, definitions of key terms including “critical incident,” “directly involved,” and “covered employee,” and penalties for non-compliance.**
  - ii. Including information on how to determine if an incident is a critical incident and what to do if unsure.**
  - iii. Providing information and examples of the required steps after a critical incident, according to UP’s CISP.**
  - iv. Providing information on the roles and responsibilities of those involved in the aftermath of a critical incident, including not only the managers, dispatchers, and directly-involved employees but also the PST and EAP.**
  - v. Allowing Peer Support and EAP personnel to provide manager training on critical incidents, UP Policy, and 49 CFR Part 272.**
- c. Evaluate and implement ways to enhance the ability of the PST to enable effective implementation of UP’s CISP. Consider the following:**
  - i. Developing and implementing a schedule for regular refresher training for PST members.**
  - ii. Providing opportunities for recruitment and training of new PST members.**

### *2. Employee Critical Incident tracking system lacks important data.*

UP currently has a robust data system with information about those employees who have been involved in a critical incident and seek EAP assistance. This database includes information on previous critical incidents in which an employee may have been involved, outreach attempts provided to the employee, and relief given. EAP personnel note that the effects of critical incidents on an employee can be cumulative, and that having knowledge about how many prior incidents an employee has experienced can lead them to offer more comprehensive or effective support. Unfortunately, the system is not currently designed to enable the EAP team to retain even basic contact information for employees involved in a critical incident but who do not accept relief from duty or additional assistance. It is possible that an employee can show in the database as having experienced no prior critical incidents when they may have been involved in several. The design of the data system, therefore, may result in EAP underestimating the type of relief or support that an employee actually needs.



## Recommendation

- a. **Evaluate ways to document the basic information (e.g. name, date of incident, type of incident, etc.) for each employee involved in a critical incident regardless of whether that employee sought relief from the remainder of the duty tour or sought additional assistance and implement the best method.**

3. *Overall, understanding the frequency or prevalence of critical incidents can be improved.*

Currently, Peer Support and EAP personnel only have information regarding the occurrence of a critical incident if two things occur: (1) the incident was classified as critical by the manager arriving at the scene of the accident, and (2) one or more of the involved employees requested relief. If an incident is classified as critical, but no employee seeks relief, there is no system for recording the occurrence as a critical incident. In the absence of this information, UP personnel cannot evaluate how many critical incidents are happening, in total, across its system. Furthermore, Peer Support and EAP personnel do not have a way to review accident notifications in a timely fashion to confirm the determination as to whether the incident is critical and consistent with UP's CISP program and the requirements outlined in 49 CFR Part 272.

## Recommendation

- a. **Evaluate methods to ensure that Peer Support and EAP personnel have timely access to preliminary information on all accidents to facilitate effective implementation of both UP's internal policies and 49 CFR Part 272 requirements and implement the best method.**

4. *The effects on employees in the aftermath of a critical incident can be mitigated.*

Interviews with UP managers, employees, and union representatives revealed that employees involved in a critical incident sometimes remain at the scene of the immediate aftermath for an extended period of time. This may be due to the need to document the accident, logistical challenges, or other issues outside of the railroad's control. Regardless of the cause for delays in removing employees from the accident scene, extended waits can exacerbate the potential psychological distress experienced by these employees and increase the likelihood and/or severity of psychological trauma. Additionally, interviews revealed there are some corridors where critical incidents frequently occur, and employees working in these corridors have an increased exposure to critical incidents and increased likelihood and severity for resultant trauma.

## Recommendations



- a. **Work with those involved in all aspects of UP’s CISP program to find ways to reduce the amount of time that crews at the scene of a critical incident wait for relief.**
- b. **Develop and implement systems to mitigate the risk of being exposed to the aftermath of a critical incident for extended periods. These systems could include training, immediately available support resources, or opportunities for employees to distance themselves from potentially psychologically distressing aspects during the immediate aftermath at the scene of a critical incident.**
- c. **Develop and implement a risk mitigation program and training for those employees working in high risk corridors.**

## **B. Grade Crossing Safety**

Criteria: 49 CFR Part 234.

1. *UP employee awareness of, and compliance with, rules and regulations related to grade crossings could be improved.*

FRA selected a total of 13 “multiple collision locations” on UP’s system in Houston, TX, for this audit. Each of the selected crossings experienced two or more collisions between 2016-2020. In particular, Winkler Drive is a four-lane roadway equipped with standard-mast flashing lights and gates (DOT Crossing Inventory Number 859574R at milepost (MP) 8.670 on UP’s Houston Division/Galveston subdivision) that has experienced two collisions between 2016 to 2020. There is a nearby highway traffic intersection within several hundred feet of the crossing, with traffic signals at the intersection. Also, the grade crossing warning devices are interconnected with simultaneous preemption.

On August 18, 2021, at about 11:40 am CST, three FRA inspectors observed that the flashing lights and gates at the Winkler Drive crossing were activated with no train approaching. FRA contacted UP’s Response Management Communications Center and UP Signal Operations and reported the gates down with no approaching trains. While at the activated crossing, an FRA inspector witnessed a near head-on collision between a tractor-trailer and another motor vehicle when the drivers of both vehicles attempted to circumvent the lowered gates from opposite roadway directions.

After further investigation, FRA discovered a UP MOW gang working on the Main track about 0.5 miles north of the crossing. FRA interviewed the Employee-in-Charge (EIC) who stated they were working under track occupation authority (track and time) granted by the Terminal Dispatcher within Yard Limits (granted about 11:20 AM). FRA asked if the MOW gang contacted or requested assistance from UP Signal Maintenance, and the EIC indicated they had not. The EIC stated the gang had shunts down on the track prior to cutting/welding on the rail.

The MOW gang failed to follow 49 CFR § 234.209 and UP safety rules regarding procedures for providing protection at an active grade crossing. FRA issued a defect with a recommendation for

civil penalties<sup>1</sup> to FRA’s Office of the Chief Counsel (§ 234.209 defect: *Interference with Normal Functioning of System*). FRA notified UP officials of its pending recommendation for civil penalties and is currently awaiting a remedial “Follow-up/Action Plan” from UP.

The Lockwood Street crossing is a four-lane highway-rail grade crossing equipped with mast mounted flashing lights and two cantilevered flashing light structures over each of the two opposing roadway lanes (DOT Crossing Inventory Number 859523F at MP 1.150 on UP’s Houston Division/Galveston Subdivision). FRA inspected this grade crossing on August 17, 2021. At the time of this inspection, FRA observed that the ladder (i.e. climbing apparatus) to the cantilever flashing light structures was not secured with a lock on the southbound approach, and the climbing apparatus on the northbound approach was bent, unsafe, and unsecured.

Failure to secure the highway-rail grade crossing warning system apparatus (i.e. the ladders) in compliance with 49 CFR § 234.211 and UP safety rules resulted in the cantilever flashing lights being vulnerable to unauthorized entry, thus increasing the risk of property damage and accidents caused by damaged or malfunctioning grade crossing warning devices.

FRA issued a defect (§ 234.211 defect: *Security of warning system apparatus*) and UP’s Manager of Signal Maintenance was contacted. FRA will conduct a follow-up inspection after 30 days to determine whether the ladder apparatus for both cantilever flashing lights structures has been repaired and secured.

## **Recommendation**

**a. Evaluate methods to ensure that employees fully understand the importance of compliance with FRA regulatory requirements for protecting grade crossings equipped with train-activated warning devices and for securing grade crossing warning system apparatus from unauthorized entry. Implement the best method identified by the evaluation.**

2. *UP’s standard for Emergency Notification System (ENS) sign placement is ineffective.*

For the 32 highway-rail grade crossings included in this audit, 27 were inspected for compliance with 49 CFR § 234.217 - *Flashing Light Units*, 49 CFR § 234.245 - *Signs*, and 49 CFR § 234.311 - *ENS sign placement and maintenance*. With respect to these three regulations, FRA identified defects at eight crossings.

Highway-Rail Grade Crossing safety is compromised when the flashing lights and signs at crossings are not maintained in good condition. During an FRA inspection conducted August 17-18, 2021, FRA observed that the flashing light units at three highway-rail grade

<sup>1</sup> Winkler Rd. (DOT Inspection Report, Report Number 53, Inspection Point (U.S. DOT 859574R – MP 08.67 on the Galveston Subdivision) inspected by FRA on 8/18/21.

crossings,<sup>2</sup>were not compliant with the requirements of 49 CFR § 234.217 related to the condition and alignment of flashing light units. FRA also observed that signs installed at two highway-rail grade crossings,<sup>3</sup> were not maintained in good condition.

FRA also noted a problem with the placement of ENS signs at three highway-rail grade crossings. According to 49 CFR § 234.311(b)(1):

each sign required by paragraph (a) [“on each approach to the crossing”] of this section must be located at the crossing except as provided in paragraph (a)(2)(ii) [at yard, port or dock facilities], and maintained by the responsible railroad so that the sign (i) is conspicuous to users of the roadway or pathway by day or night.

Conspicuity of ENS signs can help prevent delays when motorists need to report an unsafe condition at a grade crossing. During the FRA inspection conducted August 17-18, 2021, FRA observed three highway-rail grade crossings<sup>4</sup>, with ENS signs that were not compliant. At these crossings, a motorist’s ability to see the ENS sign was blocked by a crossing gate arm in the upright position. FRA will conduct a 30-day follow-up inspection to verify that the placement of ENS signs at these highway-rail grade crossings have been corrected and brought into compliance with 49 CFR § 234.311.

## **Recommendation**

- a. Review the UP standard for placement of ENS signs to achieve 100 percent effectiveness for roadway user conspicuity, and ensure employees comply with FRA’s conspicuity requirement for ENS signs at all highway-rail grade crossings.**

<sup>2</sup> Hirsch Rd. (DOT Crossing Inventory Number 755640L – MP 0001.197 on the Houston Division/Bell Line at Houston Subdivision) inspected by FRA on 8/17/21; Lockwood Dr. (DOT Crossing Inventory Number 755646C – MP 0001.920 on the Houston Division/Bell Line at Houston Subdivision) inspected by FRA on 8/17/21; and Eastwood St. (DOT Crossing Inventory Number 859522Y – MP 0000.930 on the Houston Division/Galveston Subdivision) inspected by FRA on 8/18/21.

<sup>3</sup> Sherwin St. (DOT Crossing Inventory Number 758528K – MP 0365.650 on the Houston Division/Houston Subdivision) defect issued for a “2Tracks” sign that is faded, inspected by FRA on 8/17/21; and Long St. (DOT Crossing Inventory Number 758628E – MP 004.627 on the Houston Division/Harrisburg Subdivision) defect issued for a “2Tracks” sign that is faded, inspected by FRA on 8/18/21.

<sup>4</sup> Schweikhardt St. (DOT Crossing Inventory Number 755644N – MP 0001.450 on the Houston Division/Bell Line at Houston Subdivision) a § 234.311 defect was issued because the ENS sign was not conspicuous due to being blocked by the gate arm in the up-right position, inspected by FRA on 8/17/21; Lockwood Dr. (DOT Crossing Inventory Number 755646C – MP 1.920 on the Houston Division/Bell Line at Houston Subdivision) a § 234.311 defect was issued because the ENS sign was not conspicuous due to being blocked by the gate arm in the up-right position, inspected by FRA on 8/17/21; Lyons St. (DOT Crossing Inventory Number 755707R – MP 0000.852 on the Houston Division/Strang Subdivision) a § 234.311 defect was issued because the ENS sign was not conspicuous due to being blocked by the gate arm in the up-right position, inspected by FRA on 8/18/21.

3. *UP's program for receiving and handling ENS reports could be improved.*

UP has a program in place to comply with the requirements of 49 CFR Part 234, Subpart E that addresses receiving and handling ENS reports. During the FRA audit, however, FRA noted that the individuals who receive and process ENS reports do not consistently handle them in an appropriate manner. For example, in one instance, FRA inspectors noted a UP employee received a call from the public about an unsafe condition at a grade crossing; however, instead of handling the call in accordance with the requirements of §§ 234.303, 234.305, and 234.313, the UP employee simply terminated the call. FRA's ENS requirements provide the railroad an opportunity to learn about unsafe conditions at crossings before an accident occurs. Failure to follow up appropriately when a member of the public provides an ENS report of an unsafe condition at a grade crossing increases the likelihood of an accident.

**Recommendation:**

- a. Evaluate and implement methods to ensure that employees are aware of, and comply with, FRA regulatory requirements for appropriately responding to ENS calls from the public. Consider providing appropriate levels of supervision sufficient to ensure that UP employees are complying with FRA requirements and take appropriate action in response to ENS calls about unsafe conditions at highway-rail grade crossings.**

**C. Hazardous Materials**

Criteria: Transportation and Security requirements involving Toxic/Poisonous materials in transportation: 49 CFR §172.802(a)(2), §172.802(a)(3), and §174.14.

Train Consist requirements: 49 CFR §174.24(a), §174.26(a) and §174.26(b).

Special Permits (SP) authorized for use by UP: SP-20996 (DPU Buffer Car) and SP-21059 (electronic consist).

Hazardous Material Employee Training: §172.704.

Hazardous Material Security Plans: §172.800.

Hazardous Material Routing Analysis: §172.820.

1. *UP policies and procedures do not adequately ensure correct information about the presence and location of hazardous materials shipments in train consists.*

During the week of August 2-6, 2021, FRA's Hazardous Materials (Hazmat) Division conducted inspections at various UP yards in FRA Districts 4, 5, 6, 7, and 8 to evaluate compliance with

requirements for the security and expedited movement of Toxic/Poisonous materials in transportation. During inspections, FRA observed the following:

- a. No observable issues with unauthorized access Hazmat shipments (§ 172.802(a)(2)).
- b. No observable issues with en route security of Hazmat shipments (§ 172.802(a)(3)).
- c. One infraction with 48-hour rule (§ 174.14), of two Hazmat cars that were held longer than 48 hours.

During the week of August 10-12, 2021, FRA's Hazmat Division conducted a review of UP's Hazardous Materials Route Analysis. FRA reviewed UP's 2020 analysis data, which was conducted via the Rail Corridor Risk Management System and other internal controls established by UP. No exceptions were taken by the review team.

During the week of August 10-12, 2021, FRA's Hazmat Division also conducted a review of UP's Security Plan for compliance with the requirements under § 172.800. This review included a review of the Security Implementation Plan, a sampling of Service Unit Plans and High Threat Urban Area Assessments, AAR/TSA Risk Assessments, and Employee/Contractor Vetting Systems. No significant issues were identified, but two minor defects were identified. These defects were:

- a. § 172.820(g)(2) - Documentation was not available to demonstrate proof of consultation/notification with state fusion centers and tribal entities regarding security issues encompassing UP's system. The Special Agent in Charge (SAC) believed this action was being completed by UP's Hazmat Team. On 9/10/2021, the SAC provided FRA with additional information regarding this issue, and provided UP's corrective action plan to ensure compliance with the Hazardous Materials Regulations requirement.
- b. § 172.820(h)(1) - UP's Security Plan failed to incorporate means to address storage, delays in transit, and relevant notifications to stakeholders. Corrective action being handled by the SAC and UP Customer Service. Additional documentation was provided to FRA on 9/10/2021 and is currently under review.

During the week of August 2-6, 2021, FRA's Hazmat Division inspected train crew consists to ensure Hazmat shipments were properly documented and that crews were operating trains with consists that properly reflected the accurate placement of Hazmat shipments within the train. Although FRA did not observe any instances of Hazmat shipments without proper shipping papers or train crews without access to appropriate emergency response information, FRA did find ten instances of inaccurate train consists. The majority of the defects reflected an improper location of the Hazmat shipment within the train. However, in three of these instances, Hazmat shipments were not listed on the train consists at all. Failure to accurately document the presence and location of hazardous materials in the consist can lead to delays in effective emergency response in the event of a serious train derailment and increased safety risks to the lives and health of emergency responders.

## **Recommendation**

- a. **Ensure train crews have possession of information that accurately reflects the position of a Hazmat shipment in a train. This information is required to be in the crews' possession prior to movement and must be updated when changes to the consist occur en route.**

2. *UP should improve its compliance with Special Permits*

During the week of August 2-6, 2021, FRA's Hazmat Division inspected UP's compliance with the operating conditions of Special Permits SP-20996 and SP-21059. FRA confirmed that SP-21059 is currently in use only on their Great Lakes Service Unit and observed no compliance issues with the operating conditions of the SP. In the case of SP-20996, however, FRA observed only two trains operating under the conditions of this SP, and in both instances, the distributed power unit was found to be unsecured. Failure to comply with the conditions of a special permit may jeopardize UP's ability to maintain the SP authorization.

**Recommendation**

- a. **Evaluate and implement methods for ensuring that train crews understand and comply with the operating conditions required under Special Permits. Consider periodic reviews to verify compliance.**

3. *UP's compliance with Hazardous Material Training requirements overall is good, but some opportunities for improvement exist.*

During the week of August 10-12, 2021, FRA's Hazmat Division conducted an inspection of UP's Hazmat training compliance at UP Headquarters in Omaha, NE. This inspection of UP's Hazmat training records was the first comprehensive inspection of UP records since FRA's inspection in 2007. Overall, the FRA team was impressed with the compliance management (CPM) system UP has developed to promote and ensure training compliance with various regulatory requirements. The following was observed during our inspection of UP's Hazmat training records:

- a. UP identified 25,069 employees as Hazmat employees per the Hazardous Materials Regulations.
- b. On 8/10/2021, UP's compliance management system identified only five employees in a non-compliant state with the §172.704 requirements.
- c. UP provided FRA with 104,788 training records covering a six-year time frame for UP's active Hazmat employees. No significant discrepancies were identified in the records review, but FRA did note several instances where training data fields were blank in the information provided. UP informed us that there are some data transfer issues when their CPM system queries information from other systems. UP was able to verify the missing data and stated that they would continue to try and resolve conflicts like this when identified.
- d. FRA reviewed the requirements for Hazmat employee training for UP's SP-20996. We noted that this training was not recorded as completed through their CPM system. UP was able to confirm the delivery of the training via another application.



- e. UP did not have summary documentation of the CPM system. Supporting documentation of this sort is not only beneficial to external reviewers like FRA but also promotes long-term stability by facilitating transfer of knowledge to new personnel within UP.

## **Recommendations**

- a. **Develop a one- or two-page summary to describe the UP CPM system, to assist regulatory agencies in understanding how UP's system works, and to promote effective knowledge transfer within UP.**
- b. **Ensure that the CPM system captures all data fields from other records management systems that support UP regulatory compliance efforts.**
- c. **Ensure that the CPM documents the delivery and completion of Hazmat training specific to the training requirement for specific Special Permits, including SP-20996. Consider adding specific training codes for this purpose.**

## **D. Motive Power & Equipment (MP&E)**

Criteria: 49 CFR Parts 215, 218, 229, 231, and 232.

### *1. UP compliance with various MP&E Regulations has deteriorated dramatically.*

During the weeks August 1-14, 2021, the MP&E Division conducted inspections at numerous locations in Districts 4,5,6,7, and 8. During this audit, FRA observed UP employees' level of compliance with the Blue Signal Protection requirements. From January 2017 to July 2021, UP has averaged a defect ratio (number of defects divided by the number of units inspected) of 2.6% for these requirements. During MP&E's audit period UP's defect ratio was 4.5%, a significant increase. Failure to apply Blue Signal Protection correctly increases the likelihood of serious or fatal injuries to employees working on, under, and around equipment on the main and other than main track.

Compliance with 49 CFR § 232.103(n) – *Securement of unattended equipment* has also declined. From January 2017 to July 2021, UP averaged a defect ratio of 1.8% with respect to this section. However, during the audit period, UP's defect ratio rose to 3.9%. A decrease in compliance with securement of unattended equipment means an increase in the potential for dangerous unintended and uncontrolled movement of unattended freight equipment.

FRA also noted a decline in compliance with 49 CFR Part 215 – Railroad Freight Car Safety Standards. UP's prior defect ratio in this area was 3.0%, while the defect ratio during the period audited from August 1-14, 2021, was 3.3%. An increased defect ratio in Part 215 inspections means an increase in potential for accident/incident involving railroad freight cars in the areas of suspension system, car bodies, and draft system.

During the audit, FRA noted an increase in the defect ratio related to 49 CFR Part 229 – Railroad Locomotive Safety Standards. From January 2017 to July 2021, the defect ratio was 95.2%, but when FRA inspected UP locations as part of the audit, the defect ratio had risen to 126.6%.



An increased defect ratio related to locomotive safety standards means an increase in the potential for an accident or incident involving railroad locomotives in the areas of general safety requirements, brake system, draft system, suspension system, internal combustion equipment, and cabs and cab equipment.

UP's compliance with 49 CFR Part 231 – Railroad Safety Appliance Standards has also declined. The related 5-year average defect ratio prior to the audit was 6.7%. However, during the audit FRA found a defect ratio of 7.5%. An increased defect ratio related to Safety Appliance standards means an increase in potential for an accident, incident, or injury involving the use of safety appliances on railroad locomotives and freight cars.

FRA also noted that UP's compliance with 49 CFR Part 232 – Brake Safety Standards for Freight Car and Other Non-passenger Trains and Equipment has declined. The 5-year average defect ratio prior to audit with FRA activity codes 232 and 232A, which are related to brake safety standards, was 4.1%. During the audit, this same defect ratio was 5.9%. An increased defect ratio in the 232 activity codes means an increase in the potential for accidents or incidents involving railroad locomotives and freight cars involving brake systems.

### **Recommendations**

- a. Take steps to ensure that employees understand the importance of proper Blue Signal Protection (BSP) and comply with the requirements. Consider the following:**
  - i. Providing enhanced training in Blue Signal Protection of workers.**
  - ii. Performing regular operational testing of employees working under Blue Signal Protection for compliance with railroad operating rules and Federal Regulations.**
  - iii. Conducting regular safety stand-down meetings to discuss recent compliance history and safety trends.**
- b. Ensure employees are aware of the importance of properly securing unattended equipment and that they comply with the regulatory requirements. Consider the following:**
  - i. Perform operational testing for all train, yard, and engine (TY&E) employees, as well as Mechanical Department employees.**
  - ii. Conduct regular safety stand-down meetings to discuss recent compliance history and safety trends.**
- c. Ensure that all qualified mechanical inspectors and TY&E employees are aware of the importance of complying with the requirements in 49 CFR Part 215, Appendix D, and that they comply with those requirements. Consider the following:**
  - i. Continued training for all qualified mechanical inspectors conducting pre-departure inspections and, as well as TY&E employees performing inspections pursuant to 49 CFR Part 215, Appendix D.**
  - ii. Perform regular operational testing of employees conducting freight car inspections.**
  - iii. Conduct regular safety stand-down meetings to discuss recent compliance history and safety trends.**
- d. Ensure that UP employees are familiar and comply with the requirements of locomotive safety standards and ensure compliance. Consider the following:**
  - i. Continued training for all employees conducting locomotive daily inspections.**

- ii. **Perform regular operational testing of employees conducting locomotive daily inspections.**
  - iii. **Conduct regular safety stand-down meetings to discuss recent compliance history and safety trends.**
- e. **Ensure that all employees conducting freight car and locomotive safety appliance inspections understand and comply with Parts 215 and 229. Consider the following:**
- i. **Continued training for all employees conducting freight car and locomotive safety appliance inspections.**
  - ii. **Perform regular operational testing of employees conducting freight car and locomotive safety appliance inspections.**
  - iii. **Conduct regular safety stand-down meetings to discuss recent compliance history and safety trends.**
  - iv. **Ensure that all employees conducting brake system inspections are familiar with the requirements of 49 CFR Part 232 and that they comply with those requirements. Consider the following:**
    - v. **Continued training for all employees conducting brake system inspections.**
    - vi. **Perform regular operational testing of employees conducting brake system inspections.**
    - vii. **Conduct regular safety stand-down meetings to discuss recent compliance history and safety trends.**

## **E. Operating Practices**

Criteria: 49 CFR § 217.9, *Operational Testing Program*.

During the week of August 13 - 19, 2021, the FRA Operating Practices (OP) Division conducted multiple audits and inspections at UP. FRA selected five locations based on human factor accidents and injury data. These locations were Proviso Yard in Chicago, IL; West Colton Yard in Bloomington, CA; Council Bluffs, IA; San Antonio, TX; and Albina/Barnes Yards in Portland, OR.

UP's Part 217 program is named the Coaching, Observing, Mentoring, and Motivating with Integrity and Trust (COMMIT) program. FRA reviewed the COMMIT program to determine if UP's field managers complied with UP's program, to include the knowledge, training, qualifications, and quality of testing events.

### *1. UP's implementation of its operational testing program was not consistently implemented.*

First, while in Council Bluffs, IA, FRA noted three occurrences where a testing officer failed to properly debrief crew members per the COMMIT program. Second, while also in Council Bluffs, on two occasions, FRA observed a supervisor failing to correctly report two testing exceptions into the COMMIT program for crew members who did not have their certifications

while working. Third, while in San Antonio, TX, on one occasion, a testing officer marked an exception as a “Save” when it should have been a “Close Call” under UP’s COMMIT program. Finally, also while in San Antonio, TX, FRA noted one exception for inaccurately entering rule 6.5.1 (RCO Shove) instead of rule 6.5.

At the five selected locations a total of 19 officers were observed performing rules testing per the railroad’s program. Of those 19 officers four were found to have improperly or failed to enter observed rules failures during the assessment: 21% of observed officers. Also, in the same five locations the aggregate failure rate prior to the assessment was 3.26% and during the assessment the failure rate rose to 10.1% or a 210% difference. These two factors are highly significant in that 21% of officers observed failed to properly record rules failures and that in those same locations, when not observed by FRA inspectors when performing rules checks, railroad officers recorded half as many failures per rule check. This leads to the possible conclusion that the data collected by the railroad pertaining to employee rules compliance may be flawed and/or otherwise inaccurate. The importance of these findings cannot be understated.

FRA discussed the noted discrepancies with the railroad, the individual testing officers, and each of the officers addressed our concerns accordingly. The FRA took no exception to the testing officers being appropriately prepared, knowledgeable, and familiar with UP testing procedure and the COMMIT program.

## *2. UP’s Operational Testing Records indicate some gaps in its testing program*

FRA analyzed UP’s Operational Testing Records for the last quarter of Calendar Year 2020 for the five locations and officers during the audit. Based on this review, FRA took exception for the lack of testing for utility employees in the 4<sup>th</sup> quarter of Calendar Year (CY) 2020; this omission was also noted during the accompanied inspections at Proviso Yard, Council Bluffs Yard, and the San Antonio Area. FRA also took exception for the failure to test for compliance with remote control zones at Colton, Council Bluffs, Portland, Proviso. Only San Antonio recorded a single such test during the 4<sup>th</sup> quarter of CY 2020. Finally, FRA took exception for the failure to test for restricted speed at Council Bluffs, Colton, and Proviso.

Although the UP’s testing officers focused their evaluations on switching-related rules that historically show an important correlation to employee injuries, FRA notes that there was a noticeable lack of testing for radio use, remote control operations and remote control zones, utility employees (where applicable), and restricted speed, all of which have been shown to play a role in causing accidents, incidents, and injuries on railroad property.

### **Recommendation**

- a. Evaluate and implement ways to ensure that UP managers test employees under all operating conditions to ensure a well-rounded testing program that addresses compliance with all operating rules that lead to accidents and incidents. The program should not deemphasize certain rules, even if the railroad has not specifically**

**encountered any recent related incidents, and it should not ignore oversight on other significant operational rules that are applicable to a specific location.**

*3. UP testing officers' results appear to lack consistency*

During the audit, FRA found that UP testing officers reported significantly higher rule exception rates when they worked with FRA inspectors or during FRA inspection periods than they did when they were not accompanied by FRA inspectors.

As Table 2 shows, the 4<sup>th</sup> quarter of CY 2020's testing failure rates substantially differed from the failure rates recorded during the audit. These differences ranged in magnitude from a fairly modest increase from 5.1% to 6.4% at Proviso, to very large increases at other locations, such as a 3.0% to 12.0% increase at Colton Yard.

**Table 2. Comparison of operational testing failure rates recorded at different UP locations during the 4<sup>th</sup> quarter of 2020 and during the FRA audit.**

<b>Location</b>	<b>Test Failure Rate, 4<sup>th</sup> Quarter of Calendar Year 2020</b>	<b>Test Failure Rate during FRA audit</b>
Council Bluffs	4.2%	10.3%
Colton Yard	3.0%	12.0%
Albina	3.5%	11.0%
Proviso	5.1%	6.4%
San Antonio	4.0%	10.8%

These five locations had noticeably higher failure rates when FRA inspectors accompanied testing officers, which cannot be considered an anomaly. It is significant that in all cases UP testing officers found a greater degree of non-compliance when accompanied by FRA personnel. When not accompanied by FRA personnel, the railroad is failing to properly record the true state of rules compliance by employees. The failure to properly recognize or record rules noncompliance defeats the purpose of the program—unsafe activities may not be recognized in a timely manner and corrective actions that would prevent accidents or injuries may not be taken.

**Recommendation**

- a. Determine why there are significant differences between the testing results of officers when accompanied by FRA inspectors versus times in which the officer tests independently.**
- b. Verify that testing results under normal circumstances are accurate.**

## **F. Signal and Train Control**

*1. UP employees do not consistently take appropriate steps to avoid interference with highway-rail grade crossing warning systems.*

During the audit, FRA inspectors noted instances of employees not complying with 49 CFR § 234.209 - *Interference*, which requires that employees working in the roadway approaches to grade crossings must take action to provide for the safety of highway traffic that depends on normal functioning of the grade crossing warning system. Failure to comply with this regulatory standard led to false activations of the grade crossing warning systems, which can undermine the motoring public's confidence in the crossing warning system and encourage motorists to engage in high risk behaviors at the crossing.

### **Recommendation:**

**a. Evaluate and implement an effective method to ensure that UP employees are aware of the importance of taking measures to provide for the safety of highway traffic before performing work that affects the normal functioning of grade crossing warning systems and that they comply with the associated requirements.**

*2. UP is not consistently ensuring that records of signal tests are filed with a Supervisory Official who has appropriate jurisdiction.*

Under the requirements of 49 CFR § 236.110, UP is required to retain the records of automatic train control (ATC)/continuous cab signal (CCS) departure tests for 92 days after the completion of the test. However, UP has removed some of the repository locations where the test(s) are performed, so train crews may no longer have a location to leave the departure test slip/record prior to departure. FRA observed train crews taking both copies of the departure test record or, in some cases, throwing the completed test record away. Test records are often used in accident investigations to determine whether ATC/CCS systems played a role in causing the accident. Without those records, additional time and effort must be spent to make that determination, a situation that otherwise could be avoided.

### **Recommendation:**

**a. Evaluate and implement effective ways for employees to provide departure test results to appropriate supervisory officials in compliance with 49 CFR § 236.110. Consider placing a storage receptacle for test records at every location where tests are performed.**

## G. Track

Criteria: 49 CFR Parts 213 and 214.

During the audit between July 26-August 27, 2021, FRA's Track and Structures Division found the following main areas of concern:

1. *UP's current inspection practices are not effectively identifying certain defective conditions.*

During the period of the special audit, FRA conducted inspections of more than 15,000 inspection units. In fact, in 466 units of main track walking inspections, FRA identified 972 defects. This represents a higher defect ratio than FRA inspections have found on other Class I railroads in 2021. These defects included loose joint bars (49 CFR § 213.121), as well as loose adjustable rail braces and lost or missing frog bolts in main track. (49 CFR § 213.133.). Each of these types of defects increases the likelihood of track-caused derailments. Although FRA regulations do not specify a minimum number of walking inspections except for special trackwork, nevertheless, some types of defects are much harder to see from inside an inspection vehicle than they are during walking inspections. In addition, observations by FRA inspectors showed that UP track inspectors lacked knowledge about proper guard check gage measurement, an error that could also lead to an increased likelihood of derailments.

### Recommendations

- a. **Evaluate and implement effective processes or procedures to ensure that inspectors reliably detect defective conditions. Consider developing and implementing an improved track inspection program that incorporates a stronger emphasis on walking inspections.**
- b. **Evaluate and implement methods to ensure that employees are aware of and use the proper methods of guard check gage measurement. Consider reinstructing employees on proper guard check gage measurements.**

2. *UP employees are not consistently complying with their continuous welded rail (CWR) plan.*

Consistent with the requirements of 49 CFR § 213.119, UP developed a CWR plan that was approved by FRA. During the audit, FRA inspectors identified several locations where UP did not follow their CWR procedures for the placement of rail anchors. Improper rail anchor patterns or inadequate rail anchors can diminish track longitudinal restraining capability and increase the likelihood of track buckling or broken rail (rail pull-apart) derailments. Overall, FRA inspectors noted that UP's workforce displayed inconsistent application of UP's CWR procedures. Possible consequences of these inconsistencies include increased likelihood of track buckle and broken rail derailments due to not appropriately maintaining the Rail Neutral Temperature throughout the UP system. Both the improper rail anchor patterns and the overall inconsistent application of UP's CWR plan demonstrate that UP's current program of instruction is inadequate. Therefore, FRA makes the following recommendations:

## **Recommendations**

- a. Evaluate and implement effective methods for ensuring that employees are familiar with the UP CWR requirements and that they comply with those requirements.**  
**Consider the following:**
  - i. Reinstrucing employees on proper CWR anchoring protocol in accordance with UP's CWR plan.**
  - ii. Enhancing CWR program training for proper recording of rail plug cut-ins and rail neutral temperature adjustments.**

*2. UP employees do not effectively follow the requirements of Roadway Worker Protections.*

During its inspections, FRA personnel observed UP's roadway workers (RW) fouling track without on-track-safety (OTS). This is a violation of 49 CFR Part 214. Upon investigation of the circumstances leading to this fundamental safety error, FRA discovered that the employees had received incomplete job briefings; job briefings are required under 49 CFR § 214.315. In addition, FRA's review of UP's OTS program showed it did not have provisions for RW working near roadway maintenance machines (RMM), which is required by 49 CFR §214.341. Roadway workers fouling the track or not knowing how to safely work near RMM increases the likelihood of roadway worker injury or fatality.

## **Recommendation**

- a. Evaluate and implement effective methods for ensuring that UP employees are aware of and comply with Roadway Worker Protection requirements. Consider enhancing training to include emphasis on the importance of not fouling the track without OTS, giving complete job briefings, and including provisions for RW working in the vicinity of RMM in the OTS program to ensure RW safety when working near RMM.**



## **Conclusion**

FRA provided UP with a draft copy of this report in September 2021. UP reviewed the report, but did not provide substantive comments on the draft.

FRA's audit illustrated that in many aspects, UP's programs are largely effective and compliant with relevant safety regulations. Still, UP has many opportunities to improve employee and manager awareness of and compliance with both FRA safety regulations and UP's own safety programs. With more effective use of training, improved management oversight, or even innovative applications of technology, UP can prevent property damage, loss of life, or catastrophic damage to communities by ensuring its personnel have all of the knowledge and tools they need to maximize railroad safety.