The Impact of Distracting Electronic Devices on the Safe Performance of Duties by Railroad Operating Employees

Initial Report of the Study Required by Section 405 of the Rail Safety Improvement Act of 2008

U.S. Department of Transportation

Federal Railroad Administration
Office of Railroad Safety

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Table of Contents

Acronyms and Abbreviations

ASLRRA	American Short Line and Regional Railroad Association
BNSF	BNSF Railway Company
CFR	Code of Federal Regulations
DOT	U.S. Department of Transportation
E.O.	emergency order
FR	Federal Register
FRA	Federal Railroad Administration
GCOR	General Code of Operating Rules
KCS	Kansas City Southern Railway Company
NORAC	Northeast Operating Rules Advisory Committee
NTSB	National Transportation Safety Board
RSAC	Railroad Safety Advisory Committee
RSIA	Rail Safety Improvement Act of 2008
SWAT	Safety With A Team
UP	Union Pacific Railroad Company

The Mandate

Section 405 of the Rail Safety Improvement Act of 2008 (Division A, Pub. L. No. 110-432, 122 Stat. 4885-4886) (RSIA) provides in pertinent part as follows:

> **SEC. 405. LOCOMOTIVE CAB STUDIES.**
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> (a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the Secretary, through the Railroad Safety Advisory Committee if the Secretary makes such a request, shall complete a study on the safety impact of the use of personal electronic devices, including cell phones, video games, and other distracting devices, by safety-related railroad employees (as defined in section 20102(4) of title 49, United States Code), during the performance of such employees' duties. The study shall consider the prevalence of the use of such devices.
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> (c) REPORT.—Not later than 6 months after the completion of any study under this section, the Secretary shall issue a report on the study to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Transportation and Infrastructure.
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> (d) AUTHORITY.—Based on the conclusions of the study required under (a), the Secretary of Transportation may prohibit the use of personal electronic devices, such as cell phones, video games, or other electronic devices that may distract employees from safely performing their duties, unless those devices are being used according to railroad operating rules or for other work purposes. [1]
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Introduction

Based on the historical record, rail transportation in the United States is an extremely safe mode of transportation. However, distraction of a railroad employee who is entrusted with safety-related duties has the potential, which has been realized in several accidents described below, to compromise performance and endanger the employee, coworkers, or members of the public. Accordingly, the RSIA required the Federal Railroad Administration (FRA) to conduct a study and prepare a report addressing this issue. FRA is responding to this mandate in two phases. This report addresses the information available concerning the effects of distraction on railroad operating employees, including train crews and other operating personnel, engaged both in the locomotive cab and on the ground during switching operations. It includes information leading up to the issuance on October 1, 2008, of FRA Emergency Order No. 26 (published at 73 FR 58702; Oct. 7, 2008) (E.O. 26),[2] which strictly prohibits use of potentially distracting electronic

[1] This section also provided that "The Secretary may also study other elements of the locomotive cab environment and their effect on an employee's health and safety," and that, "[b]ased on the conclusions of other studies conducted…the Secretary may prescribe regulations to improve elements of the cab environment to protect an employee's health and safety." FRA continues to study the safety of the cab environment and may take additional regulatory or other action in the future. However, that subject is not the topic of this report.

[2] E.O. 26 was issued before the RSIA was signed into law on October 16, 2008, and Section 405 had its origins in S. 1889 as reported on March 3, 2008 (S. Rept. 110-270). Accordingly, in effect, the law asks FRA to conduct an investigation that it had already completed. FRA takes this opportunity to formally report its findings and its experience under the emergency order.

and electrical devices during the conduct of safety-critical service. This report also contains information subsequently acquired through the administration of the emergency order and by monitoring research. FRA also announces that the agency expects to codify the prohibitions in the emergency order.

The second phase of this activity consists of a separate study into issues applicable to other safety-related railroad employees, including remaining "hours of service" employees (dispatchers, signal employees) and employees in other safety-sensitive service (e.g., roadway workers, mechanical inspectors). When this study is complete, FRA will file a second report and determine whether further regulatory action is needed.

Background

Although for a number of years most railroads have had rules or procedures in place that prohibit or restrict the use of electronic devices such as cell phones and personal digital assistants (PDAs), as early as 2003 the National Transportation Safety Board (NTSB or Safety Board) began calling attention to accidents involving evidence that those rules or procedures were not always observed. The progression of FRA's thinking about this problem, leading up to issuance of E.O. 26, can be divided into three segments. First, FRA addressed appropriate use of railroad communications for legitimate business and safety purposes. Second, FRA sought to ensure that railroad rules and procedures were sufficiently specific and well understood to prevent inappropriate use of personal electronic devices—concluding initially that use of Federal regulations would involve insuperable problems of enforceability and could, if not successfully enforced, undermine respect for Federal requirements as a whole. Finally, FRA concluded that definitive action regarding the improper use of personal electronic devices was imperative.

Legitimate Business and Safety Uses

Beginning with the second half of the twentieth century, railroad operations relied heavily on the use of voice radio communications to transmit and receive "mandatory directives" (e.g., track warrants, temporary speed restrictions) and to conduct business functions such as receiving en route instructions to pick up or set out cars. When FRA amended its Radio Standards and Procedures on January 4, 1999, it was renamed "Railroad Communications," to reflect its coverage of other means of wireless communication such as cell phones, which were being increasingly relied upon as alternative means of communicating with moving trains and which also served as backup means of emergency communication. By that time, some small railroads were relying exclusively on cell phones in lieu of radios to convey emergency and need-to-know information. The revisions to Title 49 Code of Federal Regulations (CFR) Part 220 were the result of recommendations by the RSAC Working Group, which consisted of a diverse group of subject matter experts representing a wide array of railroad industry stakeholders.

In its deliberations, the Working Group examined extensive safety data, discussed how to improve compliance with existing Federal regulations on radio standards and procedures, and considered whether to mandate radios and other forms of wireless communications to convey emergency and need-to-know information. FRA sought comments on whether non-radio wireless communications procedures paralleling the radio procedures in 49 CFR Part 220 should be adopted for cell phones and other wireless devices. Particularly, FRA wanted to know

whether non-radio wireless communications had the same opportunities for misunderstanding as radio transmissions and how such procedures would be enforced. After reviewing the comments, FRA decided not to promulgate non-radio wireless communications procedures at that time, based primarily on the fact that the Working Group did not consider indepth how to ensure the accuracy and completeness of non-radio wireless communications. Accordingly, in the final rule, FRA addressed only the testing and failure of non-radio wireless communications equipment (see 49 CFR 220.37 and 220.38, respectively).

However, FRA emphasized in the preamble to the final rule that the procedures in 49 CFR 220.61 (radio transmission of mandatory directives) should be followed even when a cell phone or other form of wireless communication is used to transmit mandatory directives. FRA stated at the time that it reserved the right to revisit the issue of non-radio wireless communications procedures, if necessary.

FRA compliance activity continued to emphasize ensuring the availability of suitable radio technology and proper radio procedures, including avoidance of unnecessary "chatter" that could interfere with safety-related communications.

Focus on Personal Devices

As cellular telephone technology became more prevalent in recent years, railroad employees, like other employees, benefitted from the ability to stay in touch with families and transact incidental personal business during long periods on the job. Particularly in freight service, railroad duty tours are often punctuated by long periods of inactivity awaiting the arrival of competing traffic, and opportunities for legitimate use of personal cell phones were certainly present. However, misuse of these devices also posed the potential for distraction that could impair the performance of safety-critical tasks. As the devices became multi-functional, and particularly as younger workers brought their social networking habits into the workplace, the potential for compulsive use emerged.

The first clearly documented accident resulting from this trend occurred on May 28, 2002, near Clarendon, Texas, where two BNSF Railway (BNSF) trains collided, resulting in two fatalities. The NTSB found that all four crewmembers involved in this accident had personal cell phones. According to cell phone records obtained by the Safety Board, the locomotive engineer of the train at fault was conducting a personal call at the time the train exited the siding without authority. In its investigation of the Clarendon accident, the NTSB found that the use of a cell phone by the engineer of one of the trains may have distracted him to the extent that he was unaware of the dispatcher's instructions that he stop his train at a designated point. The NTSB consequently issued Recommendation R-03-1 to FRA: "Promulgate new or amended regulations that will control the use of cell telephones and similar wireless communication devices by railroad operating employees while on duty so that such use does not affect operational safety."

This accident set in motion a progressive effort by the NTSB, FRA, and industry officials to understand and address this source of potential distraction. After the Clarendon accident, on June 18, 2002, BNSF issued instructions to operating employees that specifically prohibited the use of cell phones and laptop computers while on duty, with certain exceptions. Under these

instructions, locomotive engineers are prohibited from using cell phones or laptop computers while operating the controls of a locomotive.

On March 17, 2004, FRA met with the NTSB at what the Safety Board termed a "Safety With A Team" (SWAT) meeting. FRA told the Safety Board that as the result of Safety Recommendation R-03-1, FRA had instructed its inspectors to increase monitoring of unauthorized use of cell phones, but that enforcement of any regulation in this area would be challenging. FRA stated that it was in the process of gathering copies of enhanced railroad operating rules that strengthened the restrictions railroads placed on the use of cell phones and that it would review all of these rules and enforcement procedures governing cell phone use to look for gaps, and consider options, to include the issuance of an FRA Safety Advisory.

FRA also stated to the Safety Board at the SWAT meeting that it would discuss the subject of cell phone usage with members of the full RSAC, and determine what actions, if any, FRA should pursue in relation to this safety recommendation. At the full RSAC meeting conducted on April 27, 2004, FRA asked that the members of all organizations come to the next full RSAC meeting prepared to discuss what their current instructions were for cell phone use, whether they need to be improved, and whether this is a subject that should be tasked to a new RSAC Working Group. At this time, FRA explained to the Safety Board that this new technology (cell phones and other wireless forms of communication) aided in reducing overcrowding of radio frequencies and that FRA wanted to take advantage of the benefits that cell phones provided to the railroad industry.

Also at this time, FRA contacted the General Code of Operating Rules (GCOR) Committee concerning the enhancement of GCOR Rule 1.10 (use of electronic devices) in the next edition of the GCOR, due to be published on April 3, 2005. However, the GCOR Committee decided not to amend the rule at that time. Rather, their position was that each member railroad should address the cell phone issue in its individual special instructions.

In a letter to the NTSB, dated May 26, 2004, FRA subsequently provided copies of all relevant railroad operating rules and procedures relating to the use of cell phones and other wireless communication devices. FRA's initial review of this material indicated that, while there is some disparity with respect to the detail of prohibitions concerning cell phone use, all railroads canvassed did have a rule that prevented and/or limited cell phone use.

FRA still believed, at that time, that railroad operating rules adequately addressed these situations and that responsibility for compliance rested with company officers and supervisors. Therefore, FRA concluded that the railroads' enforcement of their operating rules governing cell phone use was sufficient to address the issue without the intrusiveness of Federal intervention. In a letter from the NTSB to FRA dated August 19, 2004, the Board classified Safety Recommendation R-03-1 as "Open—Acceptable Response."

At the full RSAC meeting on September 22, 2004, members came prepared to determine whether there were current instructions for cell phone use, whether they needed to be improved, and if this was a subject that should be tasked to a new RSAC Working Group. FRA pointed out that the proliferation of cell phone technology has now made the devices a necessity, while also

noting, though, the many examples of how the use of these devices while in locomotive cabs of moving trains could be distracting.

The RSAC railroad members who were present at the meeting unanimously restated that they all restrict cell phone use in one form or another, but also acknowledged that the use of this, and related devices, allowed more effective communication among employees, and that many railroads even provided cell phones to their employees. It was also mentioned that redundant communication devices were required by Federal regulation (49 CFR Part 220) and that cell phones are one acceptable example. The consensus of the members present was that this was a complex issue and that they were not yet prepared to consider a Federal regulation in this area. Although FRA had not yet decided what course of action it would follow, the agency agreed to reexamine current railroad operating rules and instructions on cell phone use and develop from that review what "best practices" emerged. FRA would then circulate this best practices document among RSAC members for comments before forwarding it on to the NTSB.

In a letter from FRA to the NTSB dated August 18, 2006, FRA provided the Safety Board with an update on the status of its Recommendation R-03-01 with respect to cell phone use in the railroad industry. FRA noted that the NTSB had renewed its interest in the use of cell phones by railroad employees as the result of a collision between two BNSF freight trains near Gunter, Texas, on May 19, 2004. The NTSB had determined that 25 calls were made by crewmembers from both trains during the trip up to the time of the collision and that 22 of those calls were of a personal nature. FRA's update indicated to the Board that it had not yet decided what final course of action it would follow but, with the assistance and cooperation of the railroad's operating rules departments, it was still developing a "best practices" document. It was subsequently decided to task the RSAC Operating Rules Working Group with developing this document.

The RSAC's Operating Rules Working Group met on September 27-28, 2007, in Fort Worth, Texas. At this meeting, which was also attended by a representative of the NTSB, the Working Group discussed and agreed that the railroad industry would develop a best practices operating rule, with a representative from FRA to facilitate the process. They also agreed that if the industry as a whole could adopt and enforce it, this approach would be considered by the Board in lieu of Federal intervention.

At the next meeting of the GCOR Committee on November 14-15, 2007—also attended by rules officers from the Northeast Operating Rules Advisory Committee (NORAC) and other major eastern railroads not signatory to the GCOR, and the American Short Line and Regional Railroad Association (ASLRRA), and facilitated by a representative from FRA—a best practices operating rule was developed and agreed upon by the GCOR Committee, the ASLRRA, NORAC, and other railroads present.

At a meeting of the Operating Rules Working Group held in Washington, DC, on January 17-18, 2008, a draft of the best practices operating rule developed by the industry was shared with the Working Group and discussed at length. It was decided at that meeting that the proposed rule was acceptable, but needed further enhancements. The suggestion was made that FRA develop a safety advisory that would contain these additional enhancements, some of which were proposed at the meeting. FRA accepted this task and subsequently developed a proposed safety advisory

on the use of cell phones and similar wireless communications devices by railroad operating employees.

At a meeting of the Operating Rules Working Group held in Grapevine, Texas, on May 21-22, 2008, the proposed safety advisory on cell phone use was discussed and the document was further refined and enhanced to include many valuable suggestions. A final draft was then prepared for discussion at the next Working Group meeting.

On September 12, 2008, a collision between a Metrolink passenger train and a Union Pacific freight train in Chatsworth, California, claimed the lives of 25 people. The train's engineer was apparently engaged in text messaging while passing an absolute stop signal and proceeded into the path of an oncoming freight train. Up to this point, FRA had viewed this issue as one best suited for action by individual railroads and likely inappropriate for a Federal regulation, given the difficulty of enforcing such a prohibition. However, in the case of Chatsworth, the employing railroad (Metrolink) had a very firm and well understood policy against use of the cell phones for voice or texting while at the controls of a locomotive. Accordingly, this event rapidly transformed the thinking at FRA and within the industry. At a meeting of the Operating Rules Working Group held in Chicago, Illinois, on September 25-26, 2008, a draft of FRA's proposed Emergency Order on the use of cell phones and other forms of wireless communication was discussed, and much valuable input was received.

Emergency Order 26

On October 1, 2008, FRA issued E.O. 26, finding that the misuse of personal electronic devices constituted an emergency situation involving a hazard of death and imposing rigorous prohibitions on such misuse. The order cited the following accident investigation findings in support of this determination:

> Fatal Railroad Accidents during 2008 Involving Cell Phone Use that Are Currently Under Investigation by National Transportation Safety Board, FRA, or Both
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> 1) The National Transportation Safety Board (NTSB or Safety Board) and the FRA are currently investigating the September 12, 2008 head-on collision between a Southern California Regional Rail Authority (Metrolink) commuter train and a Union Pacific Railroad Company (UP) freight train at Chatsworth, California, which resulted in the deaths of 25 people, the injury of numerous others, and more than $7,100,500 in damages. Although NTSB has not yet determined the probable cause of the accident, preliminary information indicates that the locomotive engineer of the Metrolink commuter train may have passed a stop signal. NTSB stated that a cell phone owned by the locomotive engineer was being used to send a text message within 30 seconds of the time of the accident.
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> 2) On June 8, 2008, a UP brakeman was struck and killed by the train to which he was assigned. FRA's investigation, which has not yet been completed, indicates that the brakeman instructed the locomotive engineer via radio to back the train up and subsequently walked across the track, into the path of the moving train. Information indicates that the brakeman was talking on his cell phone at the time of the accident.

Train Collisions Between 2000 and 2006 in Which Cell Phone Use Was Involved

1) Marshall, Texas. On July 1, 2006, a northward BNSF Railway Company (BNSF) freight train collided with the rear of a standing BNSF freight train at Marshall, Texas. Although there were no injuries, damages were estimated at $413,194. Both trains had two-person crews. The striking train had passed a "Stop and Proceed at Restricted Speed" signal and was moving at 20 mph. FRA determined (1) that the collision was caused by the failure of the locomotive engineer of the striking train to comply with restricted speed and (2) that the locomotive engineer of the striking train was engaged in cell phone conversations immediately prior to the accident.

2) San Antonio, Texas. On May 27, 2006, an eastward UP freight train collided head on with a westward UP freight train at San Antonio, Texas. There were four injuries, and damages were estimated at $401,779. Both trains had two-person crews. FRA determined that the collision was caused by the eastward train locomotive engineer's inattentiveness because he was engaged in a cell phone conversation and by the conductor's failure to supervise safe operations.

3) Gunter, Texas. On May 19, 2004, one locomotive engineer died and a train conductor suffered serious burns when two BNSF freight trains collided head on near Gunter, Texas. The southbound train was traveling approximately 37 mph and the northbound train was traveling about 40 mph when the collision occurred. The trains were being operated under track warrant control rules on non-signaled single track territory. The collision resulted in the derailment of five locomotives and 28 cars, with damages estimated at $ 2,615,016. Approximately 3,000 gallons of diesel fuel were released from the locomotives, which resulted in a fire.

The General Code of Operating Rules and the BNSF System General Order Number 37 dated March 7, 2004, restricted the use of cell phones and other electronic devices. Cell phones were not to be used by crewmembers while the train or engine was moving. However, cell phone use was allowed while the train or engine was stopped, providing that such use did not interfere with required duties. Safety Board investigators obtained records that showed the number and duration of cell phone calls made by crewmembers on both trains between 1:50 p.m. and the time of the accident. During this time, a total of 25 cell phone calls were made or received by the five crewmembers on both trains while the trains were in motion. Three of these calls were related to railroad business. The southbound engineer made two of the business-related calls, and the northbound conductor made the third.

The southbound engineer's cell phone record showed activity between 3:12 p.m. and 3:16 p.m. This time period coincides with the time that track warrant authority was being received by the conductor on the southbound train. (Track Warrant No. 3583 was made effective at 3:17 p.m.) BNSF track warrant procedures required the receiver (the conductor on the southbound train in this case) to repeat back verbatim certain critical portions of the track warrant. In this instance, the track warrant had to be repeated back to the dispatcher several times before it was considered correct.

Following the 3:17 p.m. effective time on Track Warrant No. 3583, the dispatcher asked the engineer on the southbound train to use his cell phone to call him at the Network Operations Center. The engineer had to call the dispatcher twice because of poor transmission or reception during the first call. The first call to the dispatcher was made at 3:22 p.m., and the second call was made at 4:02 p.m. Both calls were recorded. The dispatcher asked the engineer to provide additional assistance to the conductor in future track warrant communications. Event recorder data indicate that both calls were made while the train was in motion. The conductor on the northbound train's cell phone records showed a call to the BNSF work order reporting line 27 at 5:04 p.m. Event recorder data indicate that the train was in motion at that time. The last cell phone activity for the southbound crew was recorded at 5:31 p.m. The call lasted about 2 minutes while the train was stopped. The last cell phone activity for the northbound crew before the collision was recorded at 5:24 p.m. The call lasted about 3 minutes while the train was moving. A 911 call was originated from the BNSF 6351 northbound brakeman's cell phone at 5:48 p.m; the accident took place at approximately 5:46 p.m.

4) Clarendon, Texas. At 8:57 a.m. on May 28, 2002, an eastbound BNSF coal train collided head on with a westbound BNSF intermodal train near Clarendon, Texas. Both trains had two-member crews, and all crewmembers jumped from their trains before the impact. The conductor and engineer of the coal train received critical injuries. The conductor of the intermodal train received minor injuries; the engineer of the intermodal train was fatally injured. The collision resulted in a fire that damaged or destroyed several of the locomotives and other railroad equipment. The cost of the damages exceeded $8,000,000.

NTSB found that all four crewmembers involved in this accident had personal cell phones. According to cell phone records obtained by the Safety Board, the conductor of the coal train used his cell phone for brief calls before the train departed Amarillo. The cell phone belonging to the engineer of the coal train was used for two calls during the morning of the accident. At 8:05 a.m., a 23-minute call originated from the engineer's cell phone. After the completion of this call, and after about 16 minutes of non-use, another call originated from the engineer's phone at 8:44 a.m. This time corresponds to the end of the last track warrant, which was given to the coal train at 8:43 a.m. This call, which lasted about 10 minutes, was to the same number as the previous call. The engineer said, and telephone company records confirm, that the number called was that of a family member. The engineer said that he could not recall the substance of the telephone calls that day. He added that he usually called this family member, who was in failing health, each morning. The coal train passed the east end of Ashtola Siding, the location at which it should have waited for the arrival of the intermodal train, at about 8:47 a.m. The engineer said he did not remember specifically being on the phone at the time his train passed the east end of Ashtola Siding.

In its investigation of the Clarendon accident, NTSB found that the use of a cell phone by the engineer of one of the trains may have distracted him to the extent that he was unaware of the dispatcher's instructions that he stop his train at a designated point. NTSB consequently issued recommendation R-03-1 to FRA: "Promulgate new or

amended regulations that will control the use of cell telephones and similar wireless communication devices by railroad operating employees while on duty so that such use does not affect operational safety."

After the Clarendon accident BNSF issued instructions on June 18, 2002, to operating employees that specifically prohibited the use of cell phones and laptop computers while on duty, with certain exceptions. Under these instructions, locomotive engineers are prohibited from using cell phones or laptop computers while operating the controls of a locomotive.

Fatal Train Incidents Between 2000 and 2005 Linked With Cell Phone Usage

1) Copeville, Texas. On December 21, 2005, a contractor working on The Kansas City Southern Railway Company's (KCS) property at Copeville, Texas was struck and killed when he stepped into the path of an approaching freight train. FRA's investigation disclosed that the contractor was talking on a cell phone at the time of the accident.

2) Gillette, Wyoming. On December 29, 2000, a BNSF freight train operating on UP tracks was stopped on a siding at Gillette, Wyoming to allow another train to pass. The conductor of the stopped train exited the leading locomotive and crossed over the track immediately in front of the passing train and was struck and killed. The FRA investigation revealed the strong possibility that the conductor may have been distracted by his cell phone use.

The order also brought together the following information from FRA field observations:

Unsafe Behavior Observed or Otherwise Witnessed by FRA Inspectors

During the course of regular inspection and enforcement activities, FRA railroad safety inspectors have observed railroad employees using cell phones in an unsafe manner, often in contravention of existing railroad rules and instructions. The inspectors took action to prevent an accident from occurring, but did so under FRA's general railroad safety authority, not pursuant to any Federal order, rule, standard or regulation. The following are examples of the unsafe behavior that FRA inspectors observed and corrected:

- An FRA operating practices specialist observed a locomotive engineer at the controls of a moving passenger train answer a cell phone call from his conductor. The conductor asked the locomotive engineer to order a taxi cab for the crew and the locomotive engineer placed such a call.
- Two FRA operating practices inspectors observed a remote-control locomotive operator walking across the tracks with his head down and talking on a cell phone. The inspectors approached him, and he admitted that the call was not work-related.

- An FRA operating practices inspector observed a locomotive engineer receive a call on a cell phone while operating the train. The engineer answered the call and told the caller he would return his call later. When the inspector questioned the engineer about his actions, the engineer stated that he was a union representative and he needed to be available to his constituents.
- On at least two occasions, an FRA Regional Administrator received telephone calls from locomotive engineers with concerns about safety issues. During the course of the telephone calls, the Regional Administrator heard a train horn and asked the locomotive engineers if they were operating a train. When they replied in the affirmative, the Regional Administrator terminated the telephone calls. An FRA headquarters specialist recently reported having the same experience. On at least two other occasions, FRA field personnel observed remote-control locomotive operators talking on a cell phone while operating the remote control locomotive.
- An FRA Deputy Regional Administrator was conducting an initial pre-employment interview over the telephone with a locomotive engineer who was applying for an FRA operating practices inspector position. The deputy regional administrator heard a train horn in a two long, one short, and one long pattern and asked the candidate if he was operating a locomotive. The candidate replied that he was, and the deputy regional administrator terminated the telephone call. The candidate was not selected.
- An FRA chief inspector observed an engineer on a passenger train use his cell phone to take a call from his conductor who was trying to find out what channel the engineer was working on. The train was operating at 5 mph in yard limits.
- An FRA hazardous materials inspector observed a remote control locomotive operator talking on a cell phone while operating the controls of a remote control locomotive during switching operations.
- A hazardous materials inspector observed a locomotive engineer initiate a phone call to the dispatcher on his personal cell phone for the purpose of copying a track warrant while operating the controls of a locomotive. Additionally, the same engineer was observed initiating a cell phone call to the dispatcher, while at the controls of a moving locomotive, releasing a track warrant, during a shoving move with the conductor on the point of the equipment.
- FRA inspectors report that they frequently observe cell phones or PDAs within reach of locomotive engineers operating trains. If the devices ring, the locomotive engineers rarely answer in the presence of the FRA inspector, but the circumstances lead a reasonable person to conclude that they would answer if the FRA inspector were not present.
- On at least two occasions, FRA personnel have observed railroad employees on locomotives watching digital video disc (DVD) players.
- Three days after the head-on collision in Chatsworth, an FRA operating practices observed a commuter rail engineer on another railroad answer a cell phone while

awaiting a signal to depart the initial passenger station for his trip. The locomotive engineer answered the phone after the FRA inspector had identified himself.

The incidents noted above occurred in various parts of the country and involved both freight and passenger trains.

E.O. 26 also reported the following results of scientific research across modes of transportation:

Motor Vehicle Operation

There is considerable scientific evidence that cell phone use, both for oral conversation and for text messaging, increases the risk of highway accidents as a result of driver distraction (Brown and Poulton, 1961; Burns, Parkes, Burton, Smith and Burch, 2002; McCartt, Hellinga, and Braitman, 2006; Parkes, Luke, Burns and Lansdown, 2007; Ranney, 2008; Reid and Robbins, 2008). "Driver distraction" is defined by the Australian Road Safety Board (Trezise, Stoney, Bishop, Eren, Harkness, Langdon, and Mulder, 2006) as follows:

Driver distraction is the voluntary or involuntary diversion of attention from the primary driving tasks not related to impairment (from alcohol, drugs, fatigue, or a medical condition) where the diversion occurs because the driver is performing an additional task (or tasks) and temporarily focusing on an object, event, or person not related to the primary driving tasks. The diversion reduces a driver's situational awareness, decision making, and/or performance resulting, in some instances, in a collision or near-miss or corrective action by the driver and/or other road user.

Use of cell phones (voice communication) while driving increases reaction times, causes failures to detect hazards, and to have more variability in lane position. A driver's use of cell phones up to 10 minutes before a crash, or at the time of a collision, was found to be associated with a fourfold increased likelihood of being involved in a crash (McCartt *et al.*, 2006; McEvoy, Stevenson, McCartt, Woodward, Haworth, Palamara, and Cercarelli 2005).

Text messaging has similar effects on driving performance. For instance, Hosking, Young, and Regan (2006) found that text messaging caused a 400-percent increase in time looking away from the road as compared to driving without text messaging. Reed and Robbins (2008) found increased reaction times, failures to detect hazards, and large increases in lane position variability. The increased reaction times observed were greater than that caused by alcohol consumption (to legal limit) and cannabis. They concluded that increased mental workload, loss of motor control caused by holding the phone, and constant shifting of visual gaze resulted in significantly impaired ability to maintain a safe road position while text messaging.

These research studies are bolstered by two highway accident investigations conducted by NTSB (NTSB, 2003b, 2007). In 2002, a Ford Explorer Sport landed on top of a Ford Windstar minivan that was subsequently hit by a Jeep Cherokee (see NTSB, 2003b). The accident resulted in five fatalities. NTSB determined that the probable cause of the collision was "the Explorer driver's failure to maintain directional control of her high-profile, short-wheel base vehicle in the windy conditions due to a combination of inexperience, unfamiliarity with the vehicle, speed, and *distraction caused by the use of handheld wireless telephone*." (Emphasis added to original text. NTSB, 2003b, p. 62). In 2004, the driver of a motorcoach on the George Washington Memorial Parkway collided with the side and underside of an overpass while talking on a hands-free cell telephone (see NTSB, 2007). NTSB determined that the probable cause of this collision "was the bus driver's failure to notice and respond to posted low-clearance warning signs and to the bridge itself due to cognitive distraction resulting from conversing on a hands-free cellular telephone while driving." (NTSB, 2007, p. 33). It should be noted that the research studies cite increased variability in lane position, which corresponds to the failure to maintain directional control of the vehicle in the 2002 accident, and failures to detect hazards, which corresponds to the bus driver's lack of response to the low-clearance warnings.

Train Operations

While there are no research studies of locomotive engineer distraction and safety performance, we can easily draw parallels between operating a motor vehicle and operating a train. Failures to detect hazards in either operating environment would result from the increase in heads-down time, constant shift of visual gaze and increased mental workload. In the railroad environment, this could result in the failure to detect signals, whistle boards, rear end marking devices, broken rails and other conditions that could cause derailments or collisions. The increased mental workload and heads-down time could also degrade situation awareness and result in speeding, excessive braking, missed radio communications, and poor train handling.

A railroad accident report by NTSB (2003a) confirms the parallels noted above. As noted above, in 2002, two freight trains had a head-on collision near Clarendon, Texas. NTSB determined that the probable cause of this accident was "the coal train engineer's use of a cell phone during the time he should have been attending to the requirements of the track warrant his train was operating under." (NTSB, 2003a, p. 28). The NTSB's findings noted that the cell phone use probably distracted the engineer and caused him not to take note of an after-arrival stipulation in the track warrant that required him to prepare his train to stop. Again, this is a failure to detect a hazard.

Based on the evidence recited above, FRA found that railroad operating employees are increasingly using cell phones and other electronic and electrical devices during railroad operations, in violation of railroad operating rules, in a manner that constitutes an emergency situation involving a hazard of death. FRA found that these obviously unsafe practices reflect the powerful influence of pervasive private use of cell phones and other electronic devices. Accordingly, powerful intervention in the form of the Emergency Order was necessary to

counteract that influence and to eliminate this source of extremely dangerous distraction in the railroad operating environment. The operative terms of E.O. 26, effective on and after October 27, 2008, are as follows:

> (a) Scope. This order sets forth prohibitions and restrictions that apply to railroad operating employees' use of mobile telephones (commonly called cell telephones or cell phones), other electronic devices or electrical devices, and other portable electronic devices (such as portable digital video disc (DVD) players, radio receivers, and audio players) capable of distracting a railroad operating employee from a safety-critical duty (by railroad operating employees either while in the cab of a moving locomotive, while working on the ground in proximity to a live track) or while another employee of the railroad is assisting in preparation of the train (e.g., during an air brake test). This order does not restrict use of the railroad radio nor does it affect the use of working wireless communications under 49 CFR Part 220.
>
> (b) Definitions. In this order–
>
> (1) Fouling a track means the placement of an individual in such proximity to a track that the individual could be struck by a moving train or other on-track equipment, or in any case is within four feet of the nearest rail.
>
> (2) Personal electronic or electrical device means an electronic or electrical device that was not provided to the railroad operating employee by the employing railroad for one or more business purposes.
>
> (3) Railroad operating employee means a person performing duties subject to 49 U.S.C. 21103, "Limitation on duty hours of train employees," an individual engaged in or connected with the movement of a train, including a hostler.
>
> (4) Railroad-supplied electronic or electrical device means an electronic or electrical device provided to a railroad operating employee by the employing railroad for one or more business purposes.
>
> (5) Switching operation means the classification of freight cars according to commodity or destination; assembling of cars for train movements, changing the position of cars for purposes of loading, unloading, or weighing; placing of locomotives and cars for repair or storage; or moving of rail equipment in connection with work service that does not constitute a train movement.
>
> (6) Train means (i) a single locomotive, (ii) multiple locomotives coupled together, or (iii) one or more locomotives coupled with one or more cars.
>
> (7) Use of an electronic or electrical device means use of a mobile telephone or another electronic or electrical device to conduct an oral communication; place or receive a telephone call; send or read an electronic mail message or text message; play a game; navigate the Internet; play, view, or listen to a video; play, view, or listen to a television broadcast; play or listen to a radio broadcast other than a radio broadcast by a railroad; play or listen to music; to execute a computational function, or to perform any other function that is not necessary for the health or safety of the person and that entails the risk of distracting the employee from a safety-critical task. An electronic or electrical device that enhances the individual's physical ability to perform these tasks, such as a hearing aid, is not covered by this order.
>
> (8) Wireless communication device means an electronic device capable of communicating remotely. Examples include cell phones, personal digital assistants

(PDAs) and portable computers (commonly called laptop computers). References to use of a wireless communication device include oral conversations, text messaging, electronic mail, and transmission or receipt of a file and one or more media.

(c) Personal electronic and electrical devices. (1) Each personal electronic or electrical device must be turned off with any earpieces removed from the ear while on a moving train, except that, when radio failure occurs, a wireless communication device may be used in accordance with railroad rules and instructions.

(2) Each personal electronic or electrical device must be turned off with any earpieces removed from the ear when a duty requires any railroad operating employee to be on the ground or to ride rolling equipment during a switching operation and during any period when another employee of the railroad is assisting in preparation of the train (e.g., during an air brake test).

(3) Use of a personal electronic or electrical device to perform any function other than voice communication while on duty is prohibited. In no instance may a personal electronic or electrical device interfere with the railroad operating employee's performance of safety-related duties.

(d) Railroad-supplied electronic and electrical devices. (1) The use of a railroad-supplied electronic or electrical device by a locomotive engineer (including a remote-control locomotive operator) is prohibited while on a moving train, or when a duty requires any member of the crew to be on the ground or to ride rolling equipment during a switching operation, or during any period when another employee of the railroad is assisting in preparation of the train (e.g., during an air brake test).

(2) A railroad operating employee other than a locomotive engineer operating the controls of a moving train may use a railroad-supplied mobile telephone or remote computing device in the cab of a moving locomotive for an authorized business purpose, after a safety briefing, provided that all assigned personnel on the crew agree that it is safe to do so. Any other use is prohibited in the cab.

(3) A railroad operating employee may use a railroad-supplied electronic or electrical device for an approved business purpose while on duty within the body of a passenger train or railroad business car. Use of the device shall not excuse the individual using the device from the responsibility to call or acknowledge any signal, inspect any passing train, or perform any other safety-sensitive duty assigned under the railroad's operating rules and special instructions.

(4) For freight train crewmembers, a railroad operating employee may not use a railroad-supplied electronic or electrical device for an approved business purpose while on duty outside the cab unless the following conditions are met: (1) the employee is not fouling a track; (2) no switching operation is underway; (3) no other safety duties are presently required; and (4) all members of the crew have been briefed that operations are suspended.

(e) Operational testing. (1) The railroad's program of operational tests and inspections under 49 CFR Part 217 shall be revised as necessary to include the requirements of this order and shall specifically include a minimum number of operational tests and inspections, subject to adjustment as appropriate.

(2) When conducting tests and inspections under 49 CFR Part 217, a railroad officer, manager or supervisor is prohibited from calling the personal electronic or electrical device or the railroad-supplied electronic or electrical device used by a

locomotive engineer while the train to which the locomotive engineer is assigned is moving.

(3) When an operational test involves stopping a train, interrupting a switching operation, or interrupting an activity involving other employees of the railroad (e.g., through use of a banner, signal, or radio communication), the limitations set forth in this order regarding use of electronic and electrical devices shall continue to be in effect even though the train movement, switching operation, or other activity is temporarily suspended.

(f) Exceptions. Notwithstanding any other provision of this order--

(1) A railroad operating employee may use the digital storage and display function of a personal or railroad-supplied electronic device to refer to a railroad rule, special instruction, timetable or other directive, if such use is authorized under a railroad operating rule or instruction;

(2) Railroad operating employees may use a personal or railroad-supplied wireless communication device as necessary to respond to an emergency situation involving the operation of the railroad or encountered while performing a duty for the railroad;

(3) A locomotive engineer (including a remote-control locomotive operator) may use electronic control systems and informational displays presented to the locomotive engineer within the locomotive cab or on a remote control transmitter to operate a train or conduct a switching operation, including functions associated with controlling switches;

(4) Under conditions authorized under 49 CFR Part 220, a railroad operating employee may use a railroad-supplied or railroad-authorized working wireless communication device, in lieu of the railroad radio, to conduct train or switching operations;

(5) A railroad employee may refer to a digital timepiece to ascertain the time of day or to verify the accuracy of speed indicators.

(g) Training. Each railroad shall instruct each of its railroad operating employees and supervisors of railroad operating employees concerning the requirements of this order and implementing railroad rules and instructions. Such instruction shall be sufficient to ensure that the requirements of this order are understood, including any relevant distinctions between the minimum requirements of this rule and any more stringent requirements implemented by the railroad.

(h) Sanctions. (1) Any individual who willfully violates a prohibition stated in this order or uses any of the described devices without observing any of the restrictions stated in this order is subject to civil penalties under 49 U.S.C. 21301.

(2) In addition, such an individual whose violation of this order demonstrates the individual's unfitness for safety-sensitive service may be removed from safety-sensitive service on the railroad under 49 U.S.C. 20111.

(3) A railroad that violates this order may be subject to civil penalties under 49 U.S.C. 21301.

(4) FRA may, through the Attorney General, also seek injunctive relief to enforce this order. 49 U.S.C. 20112.

Subsequent and Planned FRA Actions

E.O. 26 was supported by railroads and labor organizations as a necessary action and was accompanied by significant outreach to ensure awareness of the hazards presented by inappropriate use of personal electronic devices. Appendix A to this report summarizes FRA surveillance and enforcement actions under the order. FRA human factors researchers continue to follow developments in distraction research. Appendix B contains citations to literature relied upon in the emergency order and subsequent publications.

FRA expects to issue a notice of proposed rulemaking to codify and make permanent the restrictions imposed by E.O. 26. This notice will also propose to resolve issues pertaining to medical devices, use of personal devices in crew rooms and similar settings, and other matters raised by the labor organizations representing operating employees. FRA will seek to conclude this rulemaking at the earliest possible date, consistent with full consideration of public comments.

FRA will also gather data and complete analysis on the use of personal electronic devices by other safety-related employees and will file a report of that study with Congress, indicating whether FRA intends to take further regulatory action.

U.S. Department of Transportation Actions

On September 30, 2009, the Secretary of Transportation convened a Distracted Driving Summit addressing operation of transportation vehicles across all modes of transportation. Highlights of the summit included a report on National Highway Traffic Safety Administration research showing that in 2008 nearly 6,000 people died in crashes involving distracted or inattentive drivers, and more than half a million were injured. The U.S. Department of Transportation (DOT) continues to mount a national awareness campaign supported by a wide range of public and private partners.

Through the Secretary's Safety Council, established to bring together the career and non-career leadership of the Department in support of new safety initiatives, DOT will continue to seek new means of reinforcing the message that use of personal electronic devices is incompatible with attention to safety duties.

Appendix A: Emergency Order No. 26 Inspection Results

E.O. 26 was published in the Federal Register on October 7, 2008, with an effective date of October 27, 2008. Inspection results indicate the following:

	Oct. – Dec. 2008	Jan. – Dec. 7, 2009
Observations	930	3,712
Units of Inspection	1,201	5,137
Defects[1]	49	141
Violations	5	31
Defect Ratio (defects/units)(100)	4.1%	2.7%

For the 14-month period, the defects/violations recorded were as follows:

- Improper use of personal electronic and electrical devices: 117/33
- Improper use of railroad-supplied electronic and electrical devices: 12/3
- Operational testing: 42/0
- Training: 19/0

The E.O. 26, defect ratio decreased from 4.1 percent in 2008 to 2.7 percent in 2009, and represents a 34.1 percent improvement in 2009 vs. 2008.

A review of the relevant E.O. 26 inspection results related to operational testing (42 defects, no violations) and training (19 defects, no violations) indicated that the preponderance of those defects were the result of inspections on shortline railroads.

[1] A "defect" is a deviation from the standard or procedure contained in the regulation. A "violation" is a defect for which the requisite intent can be proven (if applicable) that is selected for recommendation of a civil monetary penalty.

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Appendix B: Selected Research References

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